

Article

RDI and Institutional Change: The Contextual Transfer of a National Program Supporting Incoming Engineering Doctoral Students

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Abstract

Regardless of the quality of national doctoral support initiatives, sustained improvement in doctoral education depends on institutions' ability to translate these models into contextually appropriate, locally meaningful practices. This study investigates the Rising Doctoral Institute (RDI) project and explores how its transfer across five U.S. research institutions catalyzed change within their respective doctoral student support systems on its first implementation cycle. Guided by Kezar's Change Macro Framework and implementation research, the study analyzed data collected during the transfer process, including pre- and post-implementation focus groups with Collaborating Institutional Leaders (CILs) and a post-training outcome survey measuring CILs preparedness. Findings show that while local RDI implementations preserved the program's core elements, they adapted timing, structure, and delivery to suit specific institutional conditions. Two implementation models emerged: a concentrated pre-semester workshop and a distributed academic-year series. These initial iterations primarily catalyzed first-order change by creating new support structures for doctoral transition, peer connection, and sensemaking. However, preparedness for deeper cultural change remained limited. These findings suggest that contextual transfer can drive change when implementation strategies prioritize adaptation and local leadership. However, sustained second-order change requires a more deliberate focus on mentoring, advising, and institutional culture.

Keywords: contextual transfer; doctoral student support; implementation research; institutional change; engineering doctoral education



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1. Introduction

Extensive research has identified significant challenges encountered by engineering doctoral students early in their programs, including unclear expectations, inadequate advising, limited integration, high attrition, insufficient support, and isolation ([Amelink & Edwards, 2020](#); [Bahnsen et al., 2022](#); [Buller, 2014](#); [Burt et al., 2018, 2019, 2020](#); [McGee et al., 2019, 2022](#); [Miles et al., 2020](#); [Rivera et al., 2023](#); [Sowell et al., 2015](#)). These challenges are

particularly acute during the first year, a period characterized by elevated attrition risk and inconsistent support.

Current approaches to supporting engineering doctoral students include structured mentoring programs that connect students with peer and non-supervisor mentors, advisor–advisee training models such as the Advanced Mentoring Practice Program (AMPP) (Pho et al., 2022) and the Mentoring Improvement Initiative (MII) (Gehr et al., 2023), department-level change initiatives such as AGEPC-NC (Gumpertz et al., 2025), interventions focused on graduate student mentoring mental health and well-being (Szen-Ziemianska, 2020) and doctoral networks (Doonan et al., 2018). Stage-based models of doctoral education highlight that students’ needs evolve throughout the doctoral process, with early-stage support being particularly critical for clarifying expectations, fostering academic identity, and guiding students through program milestones (Pifer & Baker, 2016). Structured mentoring and advisor–advisee training interventions address ongoing challenges in doctoral education by formalizing communication, clarifying expectations, and enhancing mentoring relationships (Gehr et al., 2023; Pho et al., 2022; Szen-Ziemianska, 2020). For example, the AMPP provides parallel training for engineering faculty advisors and first-year PhD advisees, using feedback loops to improve communication and mentoring quality (Pho et al., 2022), while MII uses individual development plans for PhD and MS students to support their academic experiences and career goals (Gehr et al., 2023). Department-level initiatives such as AGEPC-NC further advance organizational change efforts by promoting policy reform, establishing accountability structures, and implementing local change plans to improve graduate student support within academic units (Gumpertz et al., 2025). The Doctoral networks program (Doonan et al., 2018) integrates academic, research, and industry stakeholders to offer doctoral students comprehensive research training, transferable skill development, and exposure to varied professional environments. Although distinct from the RDI model, doctoral networks exemplify programs that acknowledge doctoral student success relies not only on disciplinary research preparation but also on structured support for professional development, community engagement, and readiness for diverse career trajectories.

While these models offer valuable resources for doctoral student support, a persistent gap remains in addressing the needs of early-stage engineering PhD students. Some interventions target a single aspect of doctoral success, such as mentoring quality, advisor–advisee communication, departmental climate, or mental health, rather than providing an integrated framework that addresses academic, social, professional, and psychosocial dimensions of the doctoral transition. Furthermore, various models are implemented as program-level interventions or training experiences, which limits their adaptability for institutions seeking to tailor support to their specific contexts. The Rising Doctoral Institute (RDI) project seeks to address this gap by developing a comprehensive approach.

Contextual transfer is a central concept to this study, which refers to the process through which knowledge, practices, competencies, or program models developed in one setting are applied, reconstructed, and adapted within new contexts (Down, 2011). In educational research, transfer is no longer understood as the simple movement of abstract knowledge from one situation to another. Rather, contemporary perspectives emphasize that transfer is dynamic, situated, and shaped by the social, cultural, institutional, and interactional conditions in which learning and application occur (Hajian, 2019; Blume et al., 2019; Hrabowski, 2014). From this perspective, learning acquires meaning through context, and successful transfer depends not only on what is being transferred but also on how individuals and organizations actively restructure and enact that knowledge in relation to local needs, structures, and constraints. The literature also distinguishes between transfer within a single context and transfer across multiple contexts (Rivière et al., 2019),

with increasing attention to educational designs that foster adaptability across varied environments. This distinction is particularly important for higher education because programs that are effective in one institutional setting cannot simply be replicated elsewhere without attending to differences in organizational culture, student populations, resources, policies, and disciplinary expectations. In short, contextual transfer in this study is viewed not merely as a logistical or administrative adaptation, but as a dynamic process of meaning production. As noted in broader educational literature, the permanence of learning is closely related to context; therefore, the success of the RDI depends on how the model is actively restructured and interpreted by stakeholders to fit local institutional realities.

In this paper, we use contextual transfer to describe the process by which the RDI, originally designed as a national engineering doctoral student support program, is adapted by partner institutions for local implementation on its first iteration. Contextual transfer in this study is viewed not merely as a logistical or administrative adaptation, but as a process of meaning production. As noted in broader educational literature, the permanence of learning is closely related to context; therefore, the success of the RDI depends on how the model is restructured and interpreted by stakeholders to fit local institutional realities. This framing positions RDI not as a fixed intervention to be copied, but as a transferable model with core elements that can be interpreted and enacted differently across campuses while maintaining fidelity to its underlying purpose. This is especially important given that higher education has experienced significant change in how teaching, learning, and student support are conceptualized, including growing attention to personalized learning, innovative pedagogies, and AI-supported educational approaches (Kılıç et al., 2025). However, institutional support systems for doctoral students, particularly those targeting the transition into doctoral education, have not developed at the same pace. This gap highlights the need for adaptable, context-sensitive, and sustainable models that can address the complex and diverse needs of incoming doctoral students across institutional settings.

The RDI was created to support new engineering doctoral students and to support U.S. universities in enhancing institutional capacity through contextual transfer of the core elements of the RDI, rather than by replicating a fixed model. The foundational premise of the RDI is that sustainable improvements in doctoral education in the U.S. require moving beyond national, stand-alone programs to include institutional partners capable of adapting its core elements to their specific campus contexts. Accordingly, the RDI model was developed to assist partner institutions in implementing their own versions of the RDI that align with their unique organizational structures, cultures, and priorities. To achieve this, the RDI research team identified and trained campus-based administrators and faculty who possessed the agency to transfer and implement their institution's initial RDI, adapting it to local needs and contexts while maintaining the RDI's vision and core elements for supporting engineering doctoral students.

The purpose of this paper is twofold: first, to detail the process by which partner institutions are equipped to contextually transfer the RDI model to campuses across the United States; and second, to examine how the introduction of the RDI model can facilitate change to support incoming engineering doctoral students. The guiding research question is: How does the contextual transfer of the RDI, a national engineering doctoral student support program, promote institutional change to improve the doctoral student support system?

To address this research question, we employed Kezar's Change Macro Framework (Kezar, 2018). This framework was selected because it recognizes that change in higher education is influenced by the interplay of cultural, structural, political, and cognitive forces, and that no single theory of change adequately addresses the complexity of academic

systems. This positions the RDI not solely as a technical intervention but as the initial phase of deep institutional change.

Throughout this manuscript, the acronym RDI is used to refer both to the overarching research project (i.e., The RDI Project) and the specific intervention model (i.e., The RDI model). For the purposes of this study, the term primarily denotes the latter, representing a model initiative designed for institutional adoption to enhance support for students beginning their doctoral journey.

2. The Rising Doctoral Institute (RDI) Model

The Rising Doctoral Institute (RDI) is a research-informed initiative designed to support underrepresented racial minority engineering students at the outset of their doctoral studies, a period when clear expectations and procedural knowledge are essential for informed decision-making. The RDI focuses on the first year, offering structured guidance and transparent processes to help students navigate key milestones and maintain timely progress. Implemented in the weeks preceding the first semester, the RDI incorporates workshops, small-group sessions, and evidence-based activities that integrate graduate education, research, and theory. These experiences provide students with essential knowledge, resources, and strategies to navigate, persist, and succeed in their doctoral programs. For context, we are presenting a summary of the RDI model as implemented with 30 students from different parts of the nation. A comprehensive description of the RDI is available elsewhere ([Artiles et al., 2021](#)).

The RDI consists of four core elements: a cohort model, workshops on five research-informed topics, success groups, and an assessment process.

- A. The RDI project utilizes a cohort model ([Cox, 2014](#); [Pemberton & Akkary, 2010](#)) to define its target population and structure the participant entry process. Centered on synchronized progression, the model was originally designed for underrepresented racial minority (URM) students entering doctoral programs, as supported by the National Science Foundation (NSF). However, institutions implementing the RDI locally often expanded these eligibility criteria to suit their specific institutional context. To ensure the cohort remained cohesive and goal-oriented, prospective participants underwent a formal application process requiring a CV, a doctoral program acceptance letter, and a statement of research interests and career goals. This intentional selection process allows the cohort to serve as a “community of practice,” where students can engage in collective sensemaking and build peer support systems based on shared academic milestones and professional identities.
- B. The RDI workshops are organized around five research-informed topics that influence student persistence and time-to-degree.
 1. Jump start the doctorate: This topic addresses early misconceptions regarding program expectations, funding, and advisor or committee selection ([Artiles et al., 2021](#); [Holbrook et al., 2014](#); [Lovitts, 2002](#); [Knight et al., 2018](#)).
 2. Advising and interpersonal relationships in graduate school: This topic explores strategies for maintaining healthy advising relationships, understanding advisee responsibilities, and navigating departmental norms and conflicts ([Zhao et al., 2007](#); [Devos et al., 2016](#); [Golde, 2005](#); [Wood et al., 2016](#)).
 3. Self-management for graduate school success: This topic examines the self-regulation demands of doctoral study, such as time management, engagement with literature, and the documented writing challenges in engineering ([Gardner, 2008](#); [Berdanier, 2016](#)).
 4. Wellness and work-life balance: This topic emphasizes the importance of belonging, understanding unwritten academic norms, maintaining well-being, and rec-

onciling personal identities within the doctoral experience. Research on isolation, impostor feelings, and the supportive role of peer and mentoring networks underpins this area (Felder et al., 2014; Gildersleeve et al., 2011; Mondisa et al., 2015).

5. Life after the doctorate: This topic discusses doctoral career paths and the transferable skills gained during doctoral study that are applicable to careers outside academia (Turk-Bicakci et al., 2014).
- C. The success groups consist of small-group discussions that offer a supportive environment for students to ask questions, discuss lessons learned during the RDI, share experiences from the RDI and their first year of doctoral study, and foster camaraderie. In the first RDI iteration, these groups convened for at least four sessions during the RDI week and subsequently for six sessions throughout the academic year. Facilitators, who were faculty members from outside the students' departments, encouraged candid discussion and prompted students to reflect on and potentially revise their preconceptions about graduate school.
- D. Finally, assessment data is collected through 20-min pre- and post-surveys measuring students' motivation and beliefs, as well as brief 5-min evaluations following each workshop. These evaluations provided feedback to inform future iterations of the RDI.

In summary, the RDI was designed to enable students, upon program completion, to position themselves for success in their doctoral studies, recognize and adjust expectations early, reduce the risk of disengagement and demotivation, identify tools for navigating challenges, build a supportive community, foster peer connections, and connect with campus resources.

3. Theoretical Framework

To understand how the contextual transfer of the RDI promotes institutional change to improve the doctoral student support system, we used Kezar's Change Macro Framework (Kezar, 2018). This framework provided the foundational theoretical basis for guiding the adaptation of the RDI from a national model to campus-specific implementations (Kezar, 2011, 2018) in a way that such transfer could be a catalyst for institutional change. That is, we used this framework for the design of the RDI transfer process to support second-order change, aiming for long-term shifts in institutional cultures and structures that support doctoral student success.

Kezar contends that change in higher education results from the interaction of cultural, structural, political, and cognitive forces, and that no single theory adequately addresses the complexity of academic systems (Kezar, 2018). Kezar's change framework identifies four interrelated components (i.e., type of change, context for change, agency and leadership, and approach to change), offering a logical means to interpret how change occurs in higher education (Kezar, 2011).

The type of change denotes the depth and nature of the transformation sought. Kezar differentiates between first-order change (i.e., incremental), which involves modifying practices, procedures, or structures without challenging organizational beliefs, and second order change (i.e., deep), which requires shifts in underlying norms, values, identity, and culture. Second-order change relies on legitimacy and meaning-making within academic communities rather than solely on introducing new structures, making it typically slower and more challenging (Bartunek & Moch, 1987; Kezar, 2011, 2018). First-order change can establish the conditions necessary for broader cultural shifts characteristic of second-order change (Kezar & Eckel, 2002).

The context for change comprises the institutional and environmental factors that determine the viability, direction, and pace of change. Institutional mission and identity, governance structure, resources, and internal/external politics and policies impact how

change is enacted (Kezar, 2011). Institutional context affects the alignment of initiatives with priorities, stakeholder interpretations of purpose, and leaders' capacity to utilize resources and get approvals. Given the considerable variation in institutional contexts, strategies for change are not "one-size-fits-all" (Kezar, 2011); instead, effective change must be tailored to institutional realities, considering constraints, opportunities, and structures (Kezar, 2018).

Agency and leadership emphasize the importance of individuals and coalitions with the authority, credibility, and motivation to initiate, legitimize, and sustain change. Kezar highlights that leadership in higher education requires moving beyond formal positions to enact agency to advance change across institutional cultures and governance structures (Kezar, 2018). To achieve sustainable change, actions must be coordinated across leadership, units, and partnerships; initiatives facing turnover and shifting priorities require support from networks, shared commitment, and group ownership (Kezar, 2011, 2018).

The approach to change concerns the strategies employed to facilitate change and the theoretical perspectives that guide them. Kezar contends that change in higher education must integrate multiple perspectives, including cultural, political, social cognitive, evolutionary, and managerial, to ensure shared meaning, shared values, alignments, conflict recognition, negotiation, sense-making, adaptation, and coordination over time (Kezar, 2018).

These four components were used to conceptualize the broader dynamics associated with the contextual transfer of the RDI as shown in Table 1. We define contextual transfer as the process by which Collaborating Institutional Leaders (CILs) translate the RDI into their institutional contexts while maintaining the RDI's core elements.

Table 1. Operationalization of Kezar's macro framework for the RDI as a catalyst for change at the local institutions.

Definition (Kezar, 2018)		RDI Application (Design & Transfer) Principles
Type of Change	Identifies the nature of change (first order vs. second order; technical vs. cultural).	• RDI aims toward long-term cultural and structural change in doctoral student support. • We established foundational routines and shared understanding of RDI core elements with the CILs
Context for Change	Institutional, political, social, and operational environment where change occurs.	• We selected CILs interested in supporting doctoral student success and willing to implement the RDI at their institutions. • We adapted the model and its implementation to respond to political shifts and big external factors (i.e., COVID-19).
Agency & Leadership	Positional power, cognitive frames, values, and incentives of actors leading change.	• We selected the CILs based on institutional agency and experience in student support. • The CILs shared cognitive frames and values with the RDI. • A distributed leadership model enabled collaboration and agency.
Approach to Change	Strategies or processes used to implement change and offer systemic understanding	• We provided a structured curriculum and Incentives to the CILs to support enactment of their first local RDI and subsequent iterations.

4. The RDI Contextual Transfer

The first purpose of this paper is to detail the process by which partner institutions were equipped to contextually transfer the RDI model to campuses across the United States. In this case, the RDI functions as a transferable institutional support model through which participating universities adapt shared core elements to implement locally responsive doctoral transition and support structures for incoming engineering PhD students.

The contextual transfer process follows a sequenced set of three design and implementation activities: (1) Selection of the collaborators: We selected the initial nine Collaborating Institutional Leaders (CILs) from five research universities across all U.S. regions (Southeast, Midwest, Southwest, and Northeast). (2) A structured training and resourcing strategy: We offered workshops and practical design tools to foster individual CILs agency, and (3) Local implementations: When the CILs implemented the first local RDIs adapted to their local needs and particular contexts.

4.1. *Selecting the Initial Collaborating Institutional Leaders Network*

We began the process by purposefully selecting a network of CILs willing to implement the RDI within their institutions. We selected five research-intensive institutions across multiple U.S. regions (Southeast, Midwest, Southwest, and Northeast). The first cohort of CILs consisted of nine institutional leaders who expressed a clear commitment to strengthening support for underrepresented engineering doctoral students and demonstrated readiness to pilot an RDI on their campuses. We secured the commitment of senior institutional leaders, typically a dean, assistant dean, or graduate school dean, who possessed the authority and organizational access needed to mobilize resources, coordinate across units, and adapt the model to local structures.

4.2. *Training the Collaborating Institutional Leaders*

The CILs participated in a seven-module workshop delivered in weekly sessions. The modules had two aims: (a) establishing a shared understanding of the national RDI model and its research evidence, and (b) guiding CILs through a design process to develop, resource, and evaluate an RDI aligned with their specific institutional context and student needs.

The seven modules covered design, translation, implementation, and planning. Modules 1–2 introduced the RDI structure, the change rationale, and offered activities to reveal institutional assumptions and identify levers for motivating behavior change. Module 3 focused on the lived experiences and needs of incoming underrepresented engineering doctoral students and supported CILs by providing content for their workshop, varied delivery modalities, and facilitation strategies for their campus environments. Later modules (4–6) focused on operationalization (i.e., identifying personnel, spaces, timelines, and resource pathways) followed by the development of a complete implementation plan and an assessment strategy, including guidance on aligning evaluation tools with local language and priorities.

By the end of the training, CILs were expected to: (1) articulate the national RDI model and its core components; (2) produce an initial local RDI design; (3) specify key institutional information and decisions still needed to implement locally; (4) develop an action plan for completing and launching their RDI; and (5) outline an assessment plan for implementation and outcomes. The training was informed by research and practice and promoted CIL reflection on local resources to support the RDI four core elements (i.e., cohort model, workshops, success groups, and assessment). CILs were also encouraged to identify strategic partners across and beyond the institution, leveraging relevant professional associations and external programs and engaging internal offices that influence graduate student path-

ways (e.g., admissions, graduate education, research administration, student affairs, and appropriate executive and compliance units), as well as faculty champions. We viewed CILs' preparation as a capacity-building strategy to equip local change agents with the skills to translate the national RDI model into their campus-specific contexts, aligning with the agency and leadership component of Kezar's framework.

4.3. Institutional RDI Implementation by the Collaborating Institutional Leaders

Following the training, the CILs led the first iteration of the RDI at their respective institutions. To support this transition, a member of the Principal Investigators team and a graduate research assistant accompanied the CILs during their first implementation, sometimes facilitating one of the workshops, or supporting the discussions. Besides the conversations during the focus groups and training workshops, there was no collaboration among the CILs during implementation. Across institutions, two distinct implementation models emerged. These models were not identical to the national RDI in structure, but both retained the core features (cohort model, workshops, success groups, and assessment), reflecting an approach to change grounded in translation and fit making rather than standardization (Kezar, 2018).

Three institutions implemented a concentrated, three-day workshop model, typically scheduled during orientation week and culminating in an interactive lunch Q&A on the final day. This format combined sessions open to faculty and administrative stakeholders with sessions centered on current graduate students (e.g., panels and facilitated discussions), where scheduling and interaction time allowed, success-group activities were integrated to build peer connections early in doctoral study. Two institutions implemented a distributed, academic-year model in which RDI workshops were offered periodically throughout the academic year and integrated success-group functions into those sessions, alongside interactive Q&A opportunities. This model intentionally convened doctoral students across multiple years in the PhD process, enabling "just-in-time" support aligned with students' evolving experiences and challenges during the academic year (Huggins et al., 2024). The emergence of these two models reflects Kezar's assertion that complex change efforts often require different change strategies depending on institutional constraints, available resources, and the social organization of academic life (Kezar, 2018).

In addition to structural differences between the two implementation models, feedback from CILs identified various operational factors influencing the implementation process of local RDIs. For institutions adopting the concentrated three-day model, successful implementation relied on early logistical planning, administrative approval for funding, alignment with departmental orientation schedules, and the availability of campus speakers from various departments and student-support units. While this model benefited from strong institutional engagement and relatively straightforward access to campus resources, CILs observed that orientation week imposed practical constraints. During this period, some students were still traveling, moving into housing, or participating in overlapping departmental activities, which limited opportunities for extended participant interaction and, in some cases, reduced the feasibility of fully implementing success-group activities. Conversely, institutions employing the distributed academic-year model reported advantages in providing support to students as they encountered doctoral transition challenges. However, this approach required ongoing recruitment, continuous scheduling coordination, and strategies to maintain attendance throughout the year. CILs further noted that faculty awareness, particularly among major professors, varied across institutions and affected the extent to which the local RDI was integrated into doctoral student support. For both models, CILs recommended enhancing coordination with departmental orientations,

orienting guest facilitators to RDI objectives, involving current graduate students and previous participants, and establishing more formal peer-mentoring structures.

5. Materials and Methods

The second purpose of this paper is to examine how the introduction of a local RDI can promote change in the institutions' support systems for doctoral students. To explore this purpose, we conducted an implementation research, which is the systematic study of how evidence-based programs, practices, or policies are adopted, adapted, delivered, and sustained in real-world settings, as well as the contextual factors and strategies that influence that process (Hamilton & Finley, 2019; Peters et al., 2013).

This study relied on evaluation data collected during the contextual transfer process of the first implementation cycle.

Evaluation data were gathered from multiple sources, as shown in Table 2. Details of these instruments are included in Appendices A–C.

Table 2. Sources of evaluation data.

Data Source	Participants	Purpose	Timing
Pre-implementation CIL focus group	Eight CILs	Understand early perceptions of training and readiness for local implementation	After CIL training
Training Outcome Survey	Eight CILs	Provide descriptive evidence of implementation preparedness	After CIL training
Post-implementation CIL focus group	Eight CILs	Identify challenges, strengths, costs, benefits, and recommendations	After local RDI implementation

We analyzed the qualitative data using a deductive thematic analysis informed by Kezar's Change Macro Framework and guided by Braun and Clarke's (2012) six-phase approach. First, we familiarized ourselves with the dataset by reviewing the pre- and post-implementation CIL focus groups and open-ended responses from the training outcome survey twice and each researcher wrote an analytic memo from each data set. Second, two researchers independently coded the data considering and initial deductive codes using Kezar's four components (Type of Change, Context for Change, Agency and Leadership, and Approach to Change). Representative codes included institutional readiness, resource constraints, alignment with existing support efforts, CILs ownership, administrative support, cross-campus collaboration, local needs, and sustainability planning. Third the researcher compared coding and discrepancies in code application or category placement were resolved through discussion until consensus was reached. Fourth, the researchers examined patterns within and across the coded excerpts to develop themes and reviewed and refined them in relation to the full dataset to ensure consistency across themes. The four components of Kezar's framework were retained as the primary thematic structure because they best captured recurring patterns related to contextual transfer and implementation across institutions. Finally, the themes were defined and named in alignment with the framework and the study's focus on implementation and institutional change. See Table 3 for detail about the deductive codes and theme overview.

Quantitative Likert-scale items from the training outcome survey were summarized descriptively to identify areas of stronger and weaker perceived preparedness and to contextualize the qualitative themes, their results are reported in Appendix B.

Table 3. Deductive codes and description.

Framework Component	Deductive Codes	Code Description
Type of Change	Program implementation; structural support; community-building; information-sharing; sustainability planning; cultural change tactics	Nature of change produced by local RDI implementation
Context for Change	Institutional readiness; resource constraints; timing; competing priorities; alignment with existing support efforts; recruitment conditions	Institutional and logistical conditions shaping implementation
Agency and Leadership	CIL ownership; administrative support; cross-campus collaboration; leadership capacity; partnership-building	Leadership actions and relationships that enabled implementation
Approach to Change	Local adaptation; preservation of core elements; concentrated vs distributed delivery; facilitator onboarding.	Strategies used to contextually transfer the RDI across institutions

6. Results

This section presents findings related to the contextual transfer and early implementation of local RDIs. Using Kezar’s Change Macro Framework as the analytic structure, we report findings across four interconnected themes: type of change, context for change, agency and leadership, and approach to change. Collectively, these themes illuminate how local RDI implementation unfolded across institutions, including the kinds of changes initiated, the institutional conditions that shaped those efforts, the leadership capacities mobilized, and the strategies used to adapt the national model to local settings.

6.1. Type of Change: First Order and Second Order

This theme examines the nature of change and analyzes how the RDI contextual transfer aligns with first- and second-order change. It also identifies implementation characteristics that may facilitate the conditions necessary for change.

Across institutions, CILs reported that the initial local RDI iterations required significant structural and logistical efforts to establish new support mechanisms for incoming doctoral students. Reflections emphasized implementation tasks, including identifying speakers, scheduling sessions, coordinating program content, securing resources, and integrating the RDI with existing campus supports. These findings indicate that CILs’ early efforts focused on establishing an operational structure (a first-order change) to facilitate doctoral students’ access to information, community, and guidance during their transition to graduate school.

Data from the CIL training outcome survey, including reflections and preparedness ratings, revealed strong preparedness for program implementation ($M = 4.2$ out of 5) but lower preparedness for cultural change strategies ($M = 2.9$ out of 5), such as enhancing faculty mentoring capacity, addressing systemic structures, building coalitions, and fostering sustained commitments. CILs acknowledged that establishing a shared language and support structures could serve as an initial step toward shifting institutional norms (a second-order change) in areas such as advising, doctoral transition support, sense of belonging, and doctoral student well-being.

CILs also recognized that, beyond their preparedness to implement the RDI, it is necessary to consider administrative and operational costs. These include the time required to design and coordinate the RDI, the effort needed to secure funding, and the challenge of identifying sustainable incentives for student participation. Some CILs proposed stipends or travel support as either up-front motivators or end-of-program rewards. Others sug-

gested that embedding the RDI into program marketing and recruitment strategies could yield broader institutional benefits by increasing doctoral student participation.

Across RDI models, CILs emphasized student-facing benefits that align with first-order change mechanisms, including: (a) students valuing peer-to-peer dialogue; (b) building cohort and community; and (c) receiving practical “big picture” guidance on doctoral processes. Students from institutions that implemented the distributed academic-year model, advised each other and provided peer feedback (e.g., on presentations). These benefits reinforce the role of the RDI as an enabling structure that supports sensemaking and belonging during their first year of the PhD.

This theme highlights the interplay between CIL preparedness, institutional context, and the type of change achieved. These factors collectively contributed to progress toward second-order change by establishing the structural adaptations (first-order change) necessary in the initial RDI iteration.

6.2. Context of Change: Operational, Cultural, and Political Conditions

This theme explores institutional and environmental factors that influence the viability, direction, and pace of change. CILs considered the existing support structures within their institutions and their potential impact on RDI implementation.

CILs acknowledged the presence of student-support structures within their institutions, emphasizing the need to leverage these resources to facilitate RDI delivery and integration into established routines. Operational conditions were particularly influential during the initial phase, mitigating early resistance in the first RDI iteration. Furthermore, CILs identified the need for greater attention to existing structures to assist students in navigating institutional climate, norms, and power dynamics (cultural conditions).

CILs also emphasized the importance of budget authorization and institutional endorsement as operational conditions, which sometimes required dean-level approval for resource allocation and program recognition. These observations suggest that sustaining the RDI depended not only on its perceived student value, but also on whether institutions were willing to invest in the coordination and incentives necessary.

In addition to these internal factors, CILs identified external conditions affecting RDI feasibility, including the impact of COVID-19, timing constraints at the start of the semester, travel and housing logistics, and state-level policy changes (e.g., shifts in DEI policies). These factors constrained the context for change, supporting Kezar’s assertion that environmental conditions can limit or redirect change efforts regardless of institutional mission alignment.

6.3. Agency and Leadership

This theme explores the agency, authority, credibility, and motivation of CILs to initiate change during their first RDI iteration. It also investigates how coalitions or support from individuals in authority positions serve to legitimize and sustain these changes.

Reflections and preparedness ratings from CILs in the post-training survey indicate that the training provided before the RDI implementation improved their readiness and practical capacity to initiate a local RDI iteration, thereby enhancing agency. The training sessions clarified the core components of the RDI, identified essential topics for incoming doctoral students, and provided a practical structure for initial implementation. The two RDI model implementations -the concentrated three-day workshop model and the distributed academic-year model- demonstrate strong agency among CILs, as they actively interpreted and adapted the national model to fit their institutional contexts.

Evidence from focus groups and implementation reports further indicates that CILs exercised agency not only through program delivery but also through coalition-building

and local legitimation. At several institutions, CILs secured the involvement of deans, associate deans, faculty, staff, and current graduate students, thereby strengthening the visibility and perceived importance of the RDI. For instance, one RDI held sessions in the Dean's conference room to emphasize the significance of the RDI and to reinforce that students were integral members of the College. Following the training, CILs reported only moderate preparedness to "list known problems/issues" facing incoming underrepresented doctoral students on their campus ($M = 3.3$ on a scale of 1 to 5). Comments suggested an understanding of the broader context but a lack of strategies for identifying campus-specific factors. The lowest-rated outcome was the ability to identify tactics aligned with addressing cultural change ($M = 2.9$).

Overall, this theme suggests that the training built sufficient leadership capacity for program initiation but was less effective in developing the capacity required for the deeper cultural work necessary to challenge institutional norms and practices.

6.4. Approach to Change: Translation of Core Elements Through Two Local Implementation Models

This theme examines the approach to change adopted by CILs, emphasizing strategies for implementing the RDI contextual transfer from a national model to local settings. Across institutions, CILs favored adaptation over direct replication. Data indicate that local implementations consistently preserved the core elements of the RDI, adapting them to align with specific institutional conditions. This pattern suggests that the change process was primarily guided by the transfer and contextualization of core elements.

CILs implemented two primary models: a concentrated three-day workshop and a distributed academic-year model (Huggins et al., 2024). The concentrated workshop was typically delivered near the start of the academic year. The main challenge identified was integrating the RDI into an already crowded orientation period. Student attendance was affected by travel, relocation, and housing arrangements, which limited the opportunities for interaction. In some instances, success groups were only partially implemented or postponed due to the constraints of the workshop format and timing. However, several strengths were noted: delivering the RDI before or alongside departmental orientation facilitated early student connections, encouraged the development of questions for subsequent sessions, and familiarized students with institutional resources prior to the start of classes. Early preparation, coordinated logistics, and leveraging existing speakers and campus resources were also reported to enhance implementation and increase program visibility.

The distributed model involved sessions scheduled throughout the semester or academic year. This approach offered benefits such as sustained contact and the ability to address issues as they arose. Sessions facilitated regular check-ins, peer feedback, and discussion of immediate concerns. Some students invited peers to subsequent workshops, which expanded participation and strengthened the sense of community. In certain cases, the model evolved to include an initial retreat or kickoff session followed by recurring meetings. The most frequently reported challenge was maintaining student attendance and commitment across multiple sessions, given competing schedules and responsibilities.

In both models, CILs' decision-making was influenced by local logistical and organizational factors as reflected in previous themes. All CILs agreed that timing was a recurring consideration, particularly regarding institutional orientation schedules, student arrivals, and competing responsibilities at the start of the semester. Recruitment processes also played a significant role; limitations included the lack of centralized student contact lists and challenges related to students' travel, housing timelines, or uncertainty about program modality. CILs addressed these challenges by adjusting delivery length, rescheduling sessions, adopting hybrid formats, integrating the RDI with broader orientation activities, and exploring peer mentoring or faculty champion roles to enhance continuity.

CIL reflections also indicated that the approach to change extended beyond scheduling and format, revealing that such change encompassed decisions about representation, facilitation, and content emphasis. Several implementations deliberately included faculty, staff, current graduate students, and administrators as speakers or panelists. Representation was considered important, especially when students could engage with individuals who had relevant personal or professional experiences. Some implementations expanded the scope of topics beyond the original core sessions, incorporating material on faculty communication, career pathways, health and wellness, dissertation-related issues, and funding opportunities. These adaptations demonstrate that RDI iterations involved not only modifying delivery structures but also tailoring participant involvement and content emphasis to address student needs and institutional contexts. Across institutions, CILs preserved core RDI elements while adjusting delivery strategies, participation structures, and supporting activities to align with local timing, infrastructure, recruitment realities, and student needs. These variations were not incidental to implementation; they were central to how the RDI became contextually transferred in each institution.

7. Discussion

This study investigated the contextual transfer of the Rising Doctoral Institute and its role in supporting change for incoming engineering doctoral students across five institutions. The results indicate that the first local implementation of the RDI did not replicate the national model. Instead, it functioned as a process in which Collaborating Institutional Leaders preserved the core elements of the RDI while adapting delivery, timing, and structure to their institutional contexts. Interpreted through Kezar's Change Macro Framework, these findings suggest that the initial local RDI iterations primarily generated first-order change and established conditions that may facilitate second-order change over time.

The findings highlight that improvements in doctoral student support were initially structural, rather than manifesting as immediate cultural change. The local RDIs created designated spaces for incoming doctoral students to access information, build community, and discuss challenges not typically addressed in standard orientations or support systems. The study demonstrated that CILs exercised agency in organizing and implementing the RDI, but did not necessarily shift faculty mentoring practices, address inequitable institutional practices, or intervene in broader cultural conditions affecting doctoral student experiences. The discrepancy between implementation readiness and cultural preparedness suggests that the initial RDIs functioned primarily as structural supports, rather than as immediate drivers of deeper institutional transformation. This pattern aligns with Kezar's distinction between first-order and second-order change, where new programs and support structures can lay the groundwork for broader cultural shifts but do not guarantee them independently. While administrative leadership can secure space and funding, the ultimate success of the RDI's contextual transfer for a second-order change depends on multiple stakeholders' buy-in, specifically including faculty advisors. Because there is a limit to the support provided by the CILs and the teams formed, and since doctoral students' experiences are primarily shaped by their day-to-day interactions and relationships with their advisors, future iterations of the RDI must evolve from a student-centric intervention to a broader cultural framework that actively engages such stakeholders in the mission of inclusive excellence.

The findings further indicate that contextual transfer was not a secondary aspect of implementation, but rather the mechanism that enabled implementation. Across institutions, CILs maintained the core elements of the RDI while adapting the format, timing, participation structures, and follow-up strategies to their specific contexts. This is significant for implementation research, as the results suggest that successful enactment relied less on

replicating an identical program structure and more on preserving core elements while permitting locally responsive adaptation. The emergence of two implementation models, a concentrated early workshop and a distributed academic-year model, demonstrates this point. Both models supported the same overarching change intent, but each offered distinct advantages. The concentrated model facilitated early connection and transition into graduate school, while the distributed model enabled sustained engagement, peer exchange, and timely support throughout the academic year.

The data do not indicate a straightforward relationship between the two RDI implementation models and their success. Challenges such as recruitment, attendance, scheduling, travel and housing logistics, and competition with existing orientation activities were present in both models. These findings suggest that implementation challenges were influenced less by the program format and more by factors such as institutional timing, communication infrastructure, staffing capacity, and competing demands. As a result, the viability of contextual transfer depended on institutional fit. This supports Kezar's argument that change strategies in higher education are inseparable from the organizational environments in which they are enacted; the same initiative may assume different forms, paces, and trajectories depending on local operational, political, and cultural conditions.

This study underscores the importance of agency and leadership in facilitating early change. CILs demonstrated sufficient authority, motivation, and practical guidance to initiate the first local RDI iteration. Training clarified the RDI's core elements to them, provided a framework for local design, and supported them in identifying speakers, topics, and steps for implementation. The CILs secured support from deans, administrators, staff, current graduate students, and faculty, thereby enhancing the legitimacy and visibility of the program. These findings are consistent with Kezar's emphasis on distributed leadership and coalition-building as prerequisites for institutional change. However, the results also revealed limitations to this leadership capacity. While CILs coordinated implementation effectively, they were less equipped to diagnose campus-specific problems or address the institutional and cultural conditions contributing to doctoral student inequities. This distinction is significant, as it indicates that agency for implementation does not equate to capacity for broader institutional change. Implementing a program requires coordination and commitment, whereas transforming mentoring cultures and addressing inequitable norms demands additional political, relational, and organizational efforts.

This distinction clarifies that, although institutions appeared supportive of the RDI as a student-support initiative, such support did not necessarily extend to the deeper changes required to address doctoral students' challenges, suggesting that institutional endorsement of a program does not necessarily reflect readiness for cultural change. Instead, the RDI functions both as a support intervention that assists students in navigating doctoral education and as an indicator of areas where institutional support structures and cultures remain incomplete. While selecting CILs with significant institutional influence was vital for securing the high-level administrative buy-in necessary for this first RDI iteration, the results suggest that influence alone may not be sufficient for deep-rooted integration. Future approaches to promoting the adoption of the RDI at institutions might benefit from a dyad approach; pairing college-level leaders with program coordinators or executive staff who manage the day-to-day operations of graduate programs could support sustainability and enhance the conditions for second-order change.

The findings contribute to the doctoral education literature by confirming that socialization supports students' transition into graduate education. CILs identified that some of the most valued aspects of the RDI included opportunities for peer-to-peer dialogue, community-building, practical guidance, and access to discussions that enhanced students' understanding of expectations, resources, and challenges in doctoral education. These

outcomes align with previous research (Amelink & Edwards, 2020; Peyton et al., 2025; Sowell et al., 2015), indicating that doctoral persistence and well-being are influenced by belonging, socialization, access to informal knowledge, and supportive peer and mentoring relationships.

8. Conclusions

This study investigated the contextual transfer of the RDI across five U.S. research institutions using Kezar's Change Macro Framework. Initial local implementations primarily produced first-order change by establishing new structures for doctoral transition support, community-building, and student sensemaking. However, a persistent readiness gap for second-order change was evident, particularly regarding mentoring culture, faculty engagement, and broader departmental norms.

The findings contribute to the literature by demonstrating that effective contextual transfer requires maintaining the core objectives of a national initiative while allowing adaptation to local institutional contexts. Achieving long-term change will require stronger integration between student-facing interventions and faculty- and system-level reforms.

Overall, the evidence indicates that national initiatives such as the RDI can facilitate meaningful change when implementation is treated as an adaptive process that fosters institutional ownership and capacity for sustained improvement, rather than as mere replication.

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Abbreviations

The following abbreviations are used in this manuscript:

RDI Rising Doctoral Institute
CILs Collaborating Institutional Leaders

Appendix A. Pre-Implementation CIL Focus Group

Context: This was a 30-min group conversation right after the final session of the training online workshops. It was conducted by the external evaluator (author 6) of this manuscript.

I. Opening & Introductory Questions

1. Thinking back to when you first joined the CIL workshops, what were your primary goals or expectations for the Rising Doctoral Institute (RDI)?

II. Workshop Content and Structure

2. Of all the workshop sessions provided, which specific session or activity did you find most helpful in preparing you to implement an RDI?

3. How did the workshop influence your understanding of the RDI as a whole?

4. Let's talk about the least helpful aspects or the biggest hurdles during the workshops.

4.1 Did the shift from the on-site January meeting to the 6-week virtual format affected your ability to prepare?

III. Implementation Readiness & Challenges

5. On a scale of 1 to 10, how confident do you feel in your ability to successfully execute the RDI on your campus? What factors contribute to that rating?

6. What are the primary "bottlenecks" you are currently facing as you move toward execution?

7. Let's discuss student recruitment. How will you approach the task of getting students to sign up? What specific strategies are you considering to incentivize participation?

Appendix B. Training Outcome Survey Results CIL Preparedness Ratings

RDI/CIL Outcomes	Rating (Max = 5)	Comments
List the known problems/issue facing incoming 1st year doctoral underrepresented racial minority students at your institution	3.3	I got the big picture but not necessarily ways to identify the factors on my campus
List the RDI topics aligned with the list of issues identified for 1st year underrepresented racial minority students at your institution	4.0	Great job outlining key communications that will benefit students in getting the big picture about how things operate in grad school
Identify tactics aligned with addressing cultural change for 1st year underrepresented racial minority doctoral students.	2.9	Did a great job helping us. Know what to communicate to students and a structure for ongoing support. Did not provide much content on confronting and addressing the structures that oppress. For example, what about coaching and developing faculty mentors.
Identify speakers (local or non-local) for the RDI on your campus	4.2	"Shared speakers from RDI group but not many others (like a list- not that I am recalling right now)"
Identify potential push-back for the RDI that will need to be addressed	4.0	"Funding ideas to incentivize participation, how to address institutional issues seemed limited"

Appendix C. Post-Implementation CIL Focus Group

Context: This was a 1 h group online conversation after each of the CILs implemented the first iteration of the RDI at their campuses. It was facilitated by the first author in collaboration with

authors 3 and 4 of this manuscript. The PI team accompanied the RDI implementations and conducted direct observations of its implementation. These questions are informed by these observations.

I. Opening & Introductory Questions

1. Please introduce yourself and briefly describe your role at your institution.

II. Implementation Logistics & Models

2. You each chose different timeframes for your RDI, some front-loaded before classes and others distributed throughout the semester. Reflecting on your choice, how did that timing affect student attendance and engagement?

3. How did the physical space influence the community-building aspect of your RDI?

III. Cost-Benefit Analysis (Students & Institutions)

4. Participants were asked to construct a cost benefit analysis for the institutions and students using a shared virtual board. The facilitator asked follow-up questions based on the shared information. These are examples of such questions.

5. Beyond funding, what were the primary “costs” to your department or office in terms of administrative time and personnel?

6. There was discussion about using stipends as either a “motivation to attend” or a “reward at the end” Based on your recruitment results, what role do you think financial incentives should play in future RDIs?

7. What evidence have you seen that this cohort model is impacting student persistence or confidence?

IV. Institutional Support & Resistance

8. Most of you reported in the past that “everybody is for this” in theory. However, did you encounter any gap between the Dean’s vocal support and the actual budget or resources provided?

9. What strategies did you find effective (or ineffective) for getting faculty members to acknowledge the specific challenges faced by URM students?

10. How can the RDI bridge the gap between institutional support and the individual advisor’s behavior?

V. Future Iterations

11. Which changes are you planning for the next RDI iteration at your institution?

12. Follow-up: (There was a mention of merging RDI with other orientation programs). What are the risks and benefits of integrating RDI into existing institutional structures versus keeping it as a standalone “safe space”?

13. If the RDI PI team were to speak to your Dean tomorrow, what is the most critical resource or policy change they should advocate for to ensure your RDI survives long-term?

14. If another institution were to replicate this RDI model tomorrow, what is the #1 piece of advice you would give them regarding funding and sustainability?

VI. Preparation Assessment

15. How well did the training workshops prepare you to handle “push-back” at your institution?

16. After the training workshops, you indicated lower confidence in “identifying tactics for cultural change. What additional support or content could the workshops have provided to help you navigate these “difficult-to-address” cultural elements?

VII. Final reflections

17. Is there anything else about your experience with the CIL workshops or your RDI implementation that we haven’t covered today?

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