

Enhancing the Preparation of Researchers for Transformative Research in Education

The Spencer Foundation Task Force on
Preparation for Transformative Research

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Executive Summary

Report of the Spencer Foundation Task Force on Preparation for Transformative Research

This report offers recommendations for enhancing the preparation of education researchers—in graduate education and throughout their careers—to engage in transformative programs of research. Transformative programs of research hold at their center the goal of transforming education systems toward high-quality learning and teaching so that all students can thrive. They are conducted in generative collaboration with educators, policymakers, practitioners, families, and community; draw on insights from multiple disciplines, theories, and methodologies to make education systems better, and seek significant movement toward sustainable change in policy, practice, or pedagogy.

Preparation of researchers for transformative research means becoming ready to contribute to that collaborative effort and to bring one's own developing expertise in support of mutual learning. Our goal is to support those responsible for teaching, learning, enacting, or resourcing the preparation of scholars: to take stock of their progress in supporting preparation for transformative research, to imagine and design the next steps, and to envision possible futures.

Assumptions about Systems Transformation

Considering the Complexity of Educational Systems is Crucial for Systems Transformation.

Change in any one component of a system is enabled and constrained by other components of the system. A key implication for transformative research is that any focused effort to enhance teaching and learning must consider which components of the system to take into account to enable sustainable change.

Heterogeneity is a Resource for Systems Transformation.

People in educational systems are engaged in multiple communities and cultures, including those of family, geographical place, intersecting social identities, organization and role, shared interest and experience, profession or expertise, and other affinities and commitments, each with existing strengths and knowledge. A key implication is the need to seek out and engage a range of perspectives in understanding and acting on problems and opportunities and to consider questions of equity and fairness in deliberation and decision-making.

Learning of adults who share responsibility for students' learning is crucial for systems transformation.

Transforming systems to enable students' learning and thriving requires attention to the learning and thriving of the professionals—educators, leaders, policy makers, researchers—and of the organizations in which they work. A key implication for programs of transformative research is that they center the goal of supporting professional and organizational learning in transformative efforts.

Learning Domains

Community Engagement

Community engagement entails developing capacities to engage, learn from, and collaborate in research with communities beyond the academy. Initial capabilities to support contributions to community engagement include:

- Learning how to join and pitch in to ongoing endeavors (Rogoff, 2014); and
- Structuring opportunities for community participation and decision making at different phases of collaborative inquiry including: developing a shared understanding of problems and envisioning futures for education beyond those experienced, organizing co-design processes, and supporting collaborative sense making.

Theoretical Pluralism

Theoretical pluralism entails engaging with a range of theoretical perspectives strategically to inform design, to understand different aspects of a problem space, and to foster an expansive understanding of how the problem space relates to elements of the larger system. Initial capabilities for theoretical pluralism include:

- Using and critiquing existing theory;
- Eliciting and making use of local partners' theories;
- Developing knowledge of and disposition to look broadly for existing theories to understand phenomena; and
- Developing depth of knowledge in a field or body of work.

Learning Domains

Methodological Pluralism

Methodological pluralism entails designing and enacting programs of research that draw on multiple methodological perspectives, about the phenomena being studied. This includes the ways of knowing which underlie them and how they might complement and challenge one another in enabling understanding and action in research contexts. Initial capabilities to support contributions include:

- Participating knowledgeably in designing transformative research, including
 - mapping complex systems in which phenomena of interest are embedded and sketching theories of action to enable change;
 - considering the affordances of a range of methodologies and related theories (recognizing that the conventional categories of qualitative, quantitative, and mixed cannot adequately represent the rich range of available methodological resources);
- Systematically reviewing relevant research drawing on multiple methodologies and theories;
- Developing methodological expertise in one or more methodologies relevant to transformative research;
- Contributing to general knowledge, considering how what was learned in particular contexts of research might be relevant elsewhere and elsewhere; and
- Engaging in comparative and critical analysis of methodologies.

Ethics in Research Practice

Ethics in research practice entails being aware of and committed to the ethical responsibilities that come with being a researcher and the nuances of how ethical commitments play out in work with educators, communities, and families in the research process. Initial capabilities to support contributions to transformative research include:

- Approaching participants from an asset point of view;
- Anticipating and monitoring benefits and risks of research across the life of a project;
- Maintaining thoughtful and continuous consent;
- Practicing answerability that both responds to the hopes and concerns of people and communities and considers the extent to which desired solutions to problems and benefits to the community are being accomplished; and
- Engaging across differences with generosity, humility, and curiosity.

Learning Domains

Digital Technologies Supporting Transformative Research

Digital technologies supporting transformative research entails being able to draw on a range of existing and emerging tools for facilitating data generation, curation, analysis, and visualization while also considering their inherent limitations and risks. Initial capabilities to support contributions with digital technologies include:

- Becoming knowledgeable about ethical issues with digital technologies being considered, used, or studied in a program of research;
- Engaging partners in theory-informed design, curation, and visualization to serve their collective goals;
- Becoming knowledgeable about frameworks and tools for ethical data management and curation; and
- Accessing and learning from large datasets to inform, contextualize, and frame contributions of local projects.

Knowledge Mobilization

Knowledge mobilization entails supporting the flow and uptake of ideas, tools, and findings from research by other researchers, intermediaries, and users of research; and enhancing the potential of research to benefit the public and positively impact systems. Initial capabilities to support contributions to knowledge mobilization in transformative research include:

- Developing facility with different forms of two-way communication that take the roles and information needs of different audiences into account;
- Learning about how research can influence policy and practice;
- Learning to support sensemaking with evidence;
- Learning about power and uses of research that have caused harms and critical analysis of methodologies.

Infrastructure

Collaborative Research Infrastructure

Collaborative research infrastructure encompasses supports for ongoing, ethical engagement with communities.

- Establish long-term institutionalized relationships between universities and local educational organizations, agencies, and communities with mutual benefit that can support sustained programs of transformative research over time;
- Develop structured learning opportunities to enter communities ethically and in a spirit of humility and partnership;
- Create archives of shared data for use by research partners; and
- Establish relationships with policy makers in education at different levels of the system.

Program Infrastructure

Program infrastructure encompasses supports within university graduate programs for student recruitment and learning trajectories.

- Expand applicant pools and criteria for admissions;
- Develop programs of study that offer coherent learning trajectories;
- Implement mentoring structures that support students in developing their professional identities and expertise; and
- Evolve a supportive program culture and informal learning opportunities where students can routinely engage in interactions central to transformative research.

Infrastructure

College/University Infrastructure

College/University infrastructure refers to supports at the college and university level for these learning opportunities and trajectories.

- Shift credit-hour requirements toward a stronger emphasis on apprenticeship within community-engaged research and research-practice partnerships;
- Offer specialized certificate programs for aspects of preparation;
- Support faculty in co-teaching and program and course re-design; and
- Shift criteria through which faculty are evaluated toward recognition of community-engaged work.

Inter-institutional Infrastructure

Inter-institutional infrastructure refers to supports for collaboration and learning across or beyond institutions of higher education.

- Create reciprocal arrangements with other universities so that students can take courses not offered at their home institutions;
- Identify and support students in engaging in learning opportunities offered by networks, consortia, and 'invisible colleges' outside universities; and
- Identify and support students in applying for mentoring fellowships sponsored by professional organizations and academies.
- Support clearinghouses that point researchers to these learning opportunities.

Considerations Beyond Academia

While our emphasis has been on universities and collaboratives as the base for developing these capabilities and infrastructural supports, other entities beyond academia play important roles in enabling and constraining this work. These include publishers and editors of journals, professional organizations and national academies, research funders, and policy makers at the state and federal levels. Among the issues that could be profitably addressed are:

- **Extended time horizons** for transformative research programs, which has implications for funding, including how funders might work together, for research policy, and for quality and productivity expectations to which researchers are typically held accountable.
- **Revised research policies, priorities, and standards** can play a major role in shaping the research enterprise in ways that enable or constrain transformative research. Fostering critical discussions about how prominent guidelines enable and constrain research, what they foreground and what they ignore, how they position researchers and research participants could prompt productive revisions.
- **Meaningful access to education research for all research partners**, including how the learnings from particular programs of transformative research—about the process as well as the outcome of research—can become accessible to research partners elsewhere and to the growing field of research partners interested in transformative programs of research.

Invitation to Reflection and Dialogue

Our hope is that faculty and students in colleges and schools of education will use—and expand on—this framework as they reflect on their own learning and teaching and that organization leaders will consider how their infrastructures might evolve to better support this work.

- **Individual researchers** at different career stages, from graduate students to senior professionals, might reflect critically on their own learning and consider additional learning opportunities.
- **Individual faculty** responsible for teaching and mentoring researchers might reflect critically on a specific course, workshop, or other learning opportunity and how it might evolve.
- **Program leaders and faculty collectives** might reflect on their curriculum—the set of learning opportunities and trajectories available to learners—how it might evolve.
- **College/university leaders** might reflect on the structures, resources, policies, and criteria for evaluation currently in place that shape teaching and learning and how they might evolve.

Taken together, these planning/reflection suggestions might support a graduate program's effort at self-study, enabling comparisons across individual perspectives, dialogue about differences, and exploration of ideas for next steps.

We hope this work will catalyze a field-wide dialogue to grow our collective understanding and capacity for action. By doing so, we hope to be a part of a collective that leans into the possibilities of transformative education, for now and for the future.

Introduction

In this report, following the charge given to us by the Spencer Foundation, we share our recommendations for enhancing the preparation of education researchers—in graduate education and throughout their careers—to engage in transformative programs of research. As articulated in our charge:

Transformative programs of research hold at their center the goal of transforming education systems toward high-quality learning and teaching that honors students' whole humanity, their developmental needs, and their families and communities. ... Creating education systems that do this entails programs of research that focus synergistically on how educational systems work and the multiple factors that enable and constrain the quality of teaching and learning.

Research that embraces these goals:

- is conducted in generative collaboration with educators, policymakers, practitioners, families, and community,
- draws on insights from multiple disciplines, theories and methods, and
- goes far beyond solely documenting the current state, to make significant movement toward change in policy, practice, or pedagogy in a way that makes education systems better.

This vision of transformative research confronts a legacy of incentives and structures in education research, and in academic scholarship more generally, that have undermined its goals (National Academies of Science, Engineering, and Medicine [NASEM], 2025). There is a history of research primarily benefiting individual researchers and universities, with little attention to whether and how research is benefiting communities, families, and young people (York et al., 2020). This tendency is incentivized by conventional expectations for promotion and tenure in universities that privilege individual scholarly productivity—grants and publications in academic journals, many behind paywalls limiting access—with little attention to whether and how the research is being used to enable education systems to make progress toward their goals (Bednarek & Tseng, 2022, Fischman et al., 2018; Transforming Evidence Funders Network [TEFN], 2023). Funding models have not supported the kinds of sustained relationships that engaged research entails (Bednarek & Tseng, 2022).

Siloed programs and departments in universities do not encourage researchers to learn from scholars whose perspectives and disciplinary orientations may challenge or complement their own. Further, insufficient resources to institutionalize relationships with partners outside universities (beyond the life of a funded project) limit researchers' opportunities to learn from their student, educator, community, and policy partners and continuously improve their own practice based on what they learn (Peurach et al., 2022).

Introduction

Federal policies and funding priorities in education have privileged a structure for projects that “does not account for ... what is now known about how evidence influences or drives changes in practice and policy” (NASEM, 2022, p. 3). Further, funding priorities have limited opportunities for the study of implementation of innovations or developing and testing innovations specifically related to problems of scale and sustainability, which means there is a limited knowledge base on how to transform systems (NASEM, 2025). Opportunities to learn to engage in transformative research are at best uneven both across and within institutions (Collaborative Education Research Collective [CERC], 2023).

For research to better inform systemic change efforts in education, education research needs to shift to include more transformative research. Encouraging developments in the field speak to the kinds of capabilities and infrastructural supports that researchers need in order to contribute to programs of transformative research. These include the emergence of multiple models of collaborative research practices for enacting and studying codesign with youth, families, communities, and educators; funding models that incentivize research–practice partnerships; institutional change efforts within universities that respond to concerns about how conventional incentives and structures have shaped research practice; and, recently, a consensus-based report explicitly focused on considerations of the capabilities for researchers to learn “in and through collaborative education research” (Collaborative Education Research Collective [CERC], 2023, p. 22).

Preparation for these emerging forms of research is critical to inform conversations about what is required to engage in transformative research. The Foundation has charged us with considering:

- the commitments and capabilities researchers need to engage in transformative research,
- how graduate training and other professional learning opportunities could be more intentional about preparing researchers for transformative research, and
- how the field might evolve its research and training infrastructures to better support these efforts.

In this report, we articulate a conceptual framework for researcher preparation that we believe is valuable for developing both individual and collective capacity of the field for transformative research. The framework is grounded in the shared knowledge and experience of the members of the task force and informed by semistructured conversations with diverse groups of colleagues across career stages and roles (See Task Force's Method in the Appendix for details).

The report reflects our commitment to equity as a guiding principle for shared reflection, study, and action (Levinson et al., 2022; NASEM, 2024). In transformative research it is critical to develop local definitions of what it means to promote opportunity and address exclusionary practices and policies, and to work collaboratively toward education systems where people can thrive on their own terms (Bang & Vossoughi, 2016; Eddy-Spicer & Gomez, 2022).

Introduction

Our report focuses on needs for reimagining graduate education to support the transformation of educational systems serving children and youth at the primary and secondary levels. However, we also consider learning goals and infrastructures to support learning of early-, mid-, and late-career scholars, as their knowledge grows in response to changing school and community environments, evolving developments in the field, and broader sociopolitical environments. Many of these scholars are also mentors to graduate students, and this is an essential aspect of their role as scholars. We imagine this report may also be relevant to those seeking to engage in transformative research in postsecondary, early childhood, and informal learning contexts.

We begin with three assumptions about systems transformation that undergird our recommendations: (1) considering the complexity of educational systems is crucial for systems transformation; (2) heterogeneity is a resource for systems transformation; and (3) learning of adults who share responsibility for students' learning is crucial for systems transformation.

Our recommendations are presented in two major sections. The first set of recommendations focuses on six integrally related learning domains we consider fundamental to the collective goals of transformative research. Our learning domains focus on (1) community engagement, (2) theoretical pluralism, (3) methodological pluralism, (4) research ethics, (5) digital technologies, and (6) knowledge mobilization. Each domain begins with a definition and explanation of how it is important to transformative research, followed by a focused set of capabilities and illustrative learning experiences intended to support researchers in preparing to contribute to the collective endeavor of transformative research.

The second set of recommendations focuses on institutional infrastructure to enhance preparation for transformative research. The infrastructural components we address are organized in terms of (1) collaborative research infrastructure, (2) program infrastructure, (3) college/school or university infrastructure, and (4) inter-institutional infrastructure.

We also suggest considerations for other entities in the education research ecosystem, including publishers and editors of journals, research funders, and policymakers at the state and federal levels.

We conclude with suggestions for using the framework—individually and collectively—to take stock of and reflect critically on current preparation, plan next steps, and imagine possible futures. We intend this report to be used by different readers for the following purposes:

- Individual researchers, from graduate students to senior professionals, can use it to reflect on their learning to engage in transformative research and consider additional learning opportunities they may want to pursue.
- Faculty responsible for teaching and mentoring researchers can use it to reflect on specific learning experiences they offer and consider how each might evolve to better support preparation for transformative research.
- Program leaders and faculty collectives can reflect on their curriculum—the set of learning experiences and pathways available to learners—and explore ways it might evolve.
- Senior administrators at universities, policy makers, funders, and leaders of professional organizations and academies—who are responsible for the infrastructure surrounding graduate preparation programs and other learning opportunities—can use the framework to reflect on available resources, incentives, policies, and structures that influence practice of and preparation for research and to consider how they might evolve.

Introduction

While we are not suggesting that all education researchers should conduct all research studies in active collaboration with communities, drawing on insights from multiple disciplines and methods to guide improvements to educational systems, we are suggesting that all researchers should have experiences that prepare them to engage in such collaborative work and help them understand how their program of research could contribute to and benefit from such work. We are also suggesting that a greater proportion of education research be geared toward the goal of contributing to systems transformation in partnership with schools and communities.

Our hope is that this report will serve as an opportunity for collective reflection and conversation within and beyond institutions that support researcher preparation and career-long learning. We also hope that professional organizations, academies, networks and funders use it to consider ways to sponsor cross-institutional conversations to support mutual learning. Our long-range hope is foundational change in the approaches that the field uses to prepare the next generation of education researchers so that they can do work that advances society-wide benefits and supports learning and thriving of individuals, communities, and institutions, especially those that have been historically marginalized.

Assumptions About Systems Transformation and Implications for Research

Transformative research for educational systems involves sustained programs of inquiry in complex learning environments where a diverse group of people concerned about the system's optimal functioning are able to bring their knowledge and experience to bear. Research partners must be able to work collaboratively to design and enact evolving programs of research—learning as they go—to address questions about interrelated aspects of education systems. These assumptions, elaborated below, guided our recommendations for learning domains and capabilities and for the institutional infrastructures necessary to support them.

Considering the Complexity of Educational Systems is Crucial for Systems Transformation

Education systems are complex. They are made up of people with ongoing relationships to one another, working together in various settings for various purposes, at multiple levels of the system, interacting over space and time. Change in any one component of a system—a classroom routine, for instance—is enabled and constrained by other components of the system and by other systems. Sustainable transformation requires that programs of research take relevant components of the system into account.

Assumptions About Systems Transformation and Implications for Research

When we walk into any classroom (from preschool to professional), what we experience is in part a function of dynamics that emerge when teachers and students interact with each other, dynamics that are shaped by wider ecologies that are ever-changing. For instance, classroom communities of students and teachers participate in or are impacted by myriad other communities and systems. These include families, peers, and local communities with differing histories, cultures, values, and aspirations. They include educational systems at the school, district, state, and federal levels as well as in the college and university systems in which classroom communities are embedded. They also include interacting systems like preparation programs, professional organizations, textbook publishers, test developers, research partnerships, legislative bodies, and so on. These systems external to the classroom produce many resources, obligations, and constraints—funding, policies, curricula, mandated tests, teaching schedules and guidelines, research recommendations, and so on—that classrooms inherit and that shape what goes on inside them. All these systems and communities are shaped by broader socio-economic-political environments in which they are embedded, including debates about the purposes of schooling that directly impact what can and can't be taught in schools (e.g., Pollock et al., 2023). (See Lee et al., 2023, on the role of complexity in the Sciences of Learning and Development [SOLD].)

Importantly, people are agentic and can accept, shape, or resist resources, obligations, and constraints. And system level behaviors—norms and routines, for instance—can also emerge from these interactions within and across systems. Thus, multiple systems and layers of context can influence what goes on in classrooms in ways that can be chaotic or coherent, coercive or nurturing of difference, and harmful or beneficial for learning and thriving.

A key implication for transformative research is that any focused effort to enhance teaching and learning must consider how and where to take the complexity of the system into account. Of course, one cannot focus on all the elements of a complex system at once; but, how one bounds a program of study—and seeks to foster change toward equitable learning—needs to be carefully considered. This includes consideration of the range of dynamics that can enable and constrain the intended change and how any designed change can influence—productively or not—other elements of the system. As Rogoff (2023) suggests, we can foreground particular aspects of the system, while keeping others in view in the background. We also need the humility to be willing to acknowledge the limitations these sorts of ecological challenges raise.

Heterogeneity is a Resource for Systems Transformation

The people in educational systems are engaged in multiple communities and cultures, including those of family, geographical place, social identity, organization and role, shared interest and experience, profession or expertise, and other affinities and commitments. Embedded in the goals of transformative research is an explicit recognition of the value of heterogeneity within and across communities, each with existing strengths and knowledge.

When engaged with respect, humility, and curiosity, heterogeneity is a fundamental driver of learning and innovation central to transformative research. People can learn from, be challenged by, and respond to one another's perspectives, such that everyone learns and grows, and something new and better can emerge.

Assumptions About Systems Transformation and Implications for Research

A key implication is the need to seek out and engage a range of perspectives in understanding and acting on problems and opportunities when the goal is transformation in education systems. For researchers, this includes working collaboratively across multiple methods, theories, and disciplines, and with the perspectives and expertise of those who work and learn within local systems and communities that are undertaking change efforts. As Rosado-May and colleagues (2020) argue, “knowledge co-creation involving different cultures requires that different systems of creating knowledge and ways of learning work together” (p. 91).

Central to honoring and learning from heterogeneity is considering questions of fairness and equity in deliberation and decision-making. It is especially important to involve those who have previously been ignored or excluded from decision-making regarding policy, practice, and research. This requires research partners to work together to illuminate unfair instances of exclusion, to identify and confront the workings of power that reproduce them, to invite community members to share their goals and aspirations for the future, and to engage in deliberation in ways that enable democratic decision-making.

Learning of Adults Who Share Responsibility for Students’ Learning Is Crucial for Systems Transformation

Transforming systems to enable students’ learning and thriving requires attention to the learning and thriving of the professionals—educators, leaders, policy makers, researchers—and of the organizations in which they work. Students benefit as well when families and local communities can learn and thrive from the ongoing work. Multiple reports, books, and articles speak to this centrality of professional learning and of the ways in which organizations and larger systems can enable and resource it and build coherence across the system (e.g., Bryk et al., 2015, 2023; Cobb et al., 2013; Daly & Finnigan, 2016; Darling-Hammond et al., 2005; NASEM, 2024; Peurach et al., 2022).

A key implication for programs of transformative research is that they center the goal of supporting professional and organizational learning in any transformative effort. To accomplish this, research partners will benefit from having an initial plan for or theory about whose learning matters and how, in light of their goals for systems change; what kinds of learning are needed for people in different roles; and how their learning might be supported, evaluated and sustained. This planning begins with the structuring of research proposal processes to bring different partners to the table. While such a plan is likely to evolve as research progresses and understandings deepen, it is valuable for research design, enactment, and use. Further, structuring opportunities for young people, families, educators, and communities to have a say in the research questions pursued and methods used, to engage in sensemaking from data and findings, and to participate in discussions and decisions about next steps, supports the kind of mutual learning crucial for sustainable systems transformation.

Learning Domains

Learning Domains

Transformative research is by definition and necessity a collective endeavor that unfolds over multiple studies and projects. No single study or project can meet the challenge of transforming educational systems nor can a single investigator working alone take on the research necessary to inform sustainable progress at the system level. Our goal is to support the preparation of researchers to contribute knowledgeably, ethically, and productively to this collective endeavor.

We have organized our recommendations for how to support the preparation of researchers into the six learning domains listed below. The domains are broad, inter-related, and relevant to researchers across their careers. However, the capabilities we've foregrounded within each domain focus on knowledge, skills, and abilities that we believe are valuable for supporting the learning of novice researchers to contribute to transformative work.

Developing capabilities across learning domains entails taking on a professional identity. The expertise researchers develop across their careers will likely weave together threads from each of the learning domains with researchers' own commitments to evolve a distinct professional identity. Scholars will also need to develop ways of representing themselves that are recognizable to others and to find ways to communicate that are legible to reviewers of products, papers, and proposals. The work of developing a professional identity is thus entwined with learning and spans all domains and career stages.

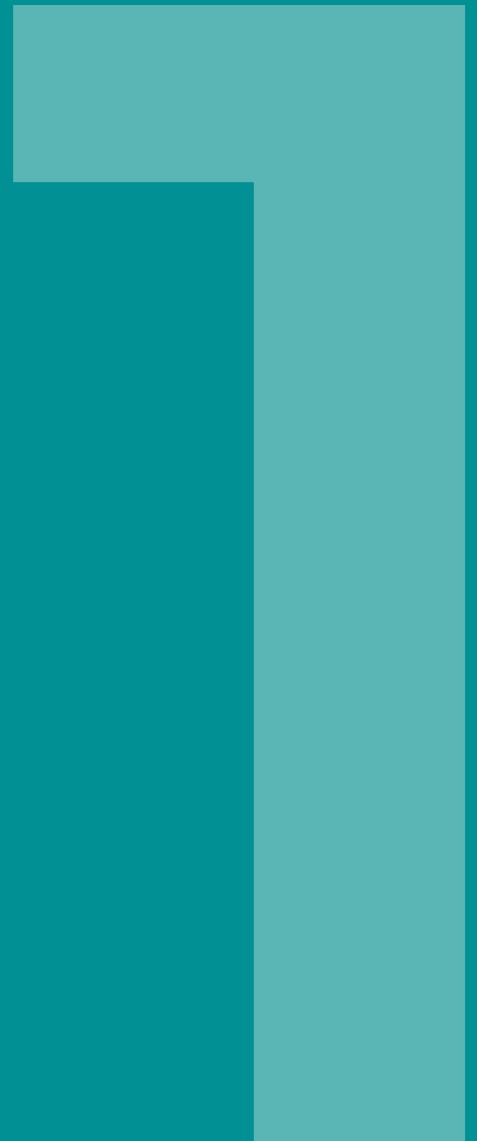
Briefly our six learning domains, elaborated below, are:

1. **Community Engagement:** developing capacities to engage, learn from, and collaborate in research with communities beyond the academy.
2. **Theoretical Pluralism:** engaging with a range of theoretical perspectives strategically to inform design, to understand different aspects of a problem space, and to foster an expansive understanding of how the problem space relates to elements of the larger system.
3. **Methodological Pluralism:** collaborating in designing and enacting programs of research that draw on multiple methodological perspectives, alongside theoretical perspectives, about the phenomena being studied. This includes the ways of knowing which underlie them and how they might complement and challenge one another in enabling understanding and action in research contexts.
4. **Ethics in Research Practice:** being aware of and committed to the ethical responsibilities that come with being a researcher and the nuances of how ethical commitments play out in work with educators, communities, and families in the research process.
5. **Digital Technologies Supporting Transformative Research:** being able to draw on a range of existing and emerging tools for supporting data generation, curation, analysis, and visualization to support transformative work while also considering their inherent limitations and dangers.
6. **Knowledge Mobilization:** supporting the flow and uptake of ideas, tools, and findings from research by other researchers, brokers and intermediaries, and users of research; enhancing the potential of research to benefit the public and positively impact systems.

Each learning domain begins with a general definition and explanation of why it's important to programs of transformative research. This is followed by a list of preliminary capabilities we think researchers should develop along with some illustrative learning experiences. The learning experiences include both ways of learning "in and through" participation in collaborative research (CERC, 2023), as well as those designed to focus on particular areas of expertise relevant to transformative research.

Learning Domains

Community Engagement



Learning Domain 1: Community Engagement

Our first learning domain involves learning how to engage communities. York and colleagues (2020), in their review of community research collaboratives, found three key ways that scholars who were engaged closely with communities defined them. Sometimes, scholars defined communities as groups of people who shared social ties, values, practices, identities, and spaces. Other times, scholars defined communities in terms of constituencies (e.g., parents, students, organizers) who share an interest in a particular issue, school, or school system. A third way scholars defined community was as those involved in a specific organization or system. The list could include parents and students, university researchers, district officials, school administrators, educators, higher education administrators, state policymakers, community organizers, and service providers. We use the word community to encompass all of these groupings with whom education researchers might productively engage.

Communities have histories that are recounted in the stories and memories of their members in particular times and places, histories that help to give significance not just to the past, but also to current ways that people view their commitments to one another and participate in shared endeavors (Basso, 1996; Bellah et al., 1985). While communities can look homogeneous to outsiders, understanding and learning from their rich and heterogeneous histories requires researchers' active engagement.

Community engagement in the sense we mean it, then, includes researchers becoming members of communities for purposes of collaborative inquiry and improvement. This entails voluntary, purposeful, and active association involving members of a community that researchers join or may already be part of in non-research roles, where interaction can be face-to-face or virtual, synchronous or asynchronous. Engagement can take on different forms, as we elaborate below.

Why Embrace Community Engagement?

There is an increasing appreciation of the role of learning ecologies in shaping and developing young people's and adults' interests and learning outcomes (Barron, 2006; National Academies of Sciences Engineering and Medicine, 2024), however, access to structured learning opportunities is inequitable (Duncan & Murnane, 2011; Pinkard, 2019). Designing for more equitable educational systems requires engaging with community members and searching for ways to change ecologies and infrastructures to advance learning goals (DeBray et al., 2022, 2023; Greenberg et al., 2020). Schools are important sites, but not the only ones, for supporting children's and youth's learning and development. The organization of and connections among different settings—from homes to parks to civic organizations, and more—also shape possibilities for learning and development beyond the school walls in ways that can both perpetuate inequities (Duncan & Murnane, 2011) or work toward attenuating them (Ito et al., 2020; Pinkard, 2019). Educators in schools and leaders at different levels are important contributors to such endeavors, but engagement with families and communities who have often been excluded from decision making in the past demands repositioning them in key roles in the search for solutions to enduring problems of inequity (Ishimaru et al., 2022).

Learning Domain 1: Community Engagement

Engagement takes many forms. For example, engagement can entail

- joining ongoing endeavors for change in the community to support them (Gutiérrez & Jurow, 2016; Rogoff, 2014; Sannino et al., 2016; Teeters et al., 2016);
- renegotiating one's own role in a community to encompass research (Ghisso et al., 2019);
- gathering people together in new or ongoing initiatives to identify concerns or priorities of a community, thereby informing the development of research questions (Lindau et al., 2011);
- learning about and connecting to communities' histories (Bang et al., 2010) to make visible funds of community knowledge and identity (Esteban-Guitart et al., 2023);
- working together to codesign interventions to promote more dignity-affirming, solidarity-based relations between families and schools (Ishimaru & Bang, 2022) as well as colleges and universities;
- negotiations of data sharing and privacy agreements among community members to support transformative work (Sabatello et al., 2022); and
- engaging community members in joint sensemaking about the significance of findings, in order to take further action (Nelson et al., 2015).

Respecting the diverse interests of people impacted by educational systems and interventions designed to transform them is one of the distinctive features of collaborative research, which involves centering the priorities and concerns of community members so they can learn and thrive. Intentionality and skill are required to organize for participation in a way that attends to power and keeps at the center the perspectives of people from systemically marginalized communities (Ishimaru et al., 2022). When executed well, these deliberations become an integrative force for unity, melding individual and collective and sometimes divergent motives into a common good that embraces diversity.

We can't expect complete agreement with community partners with whom we work; transformative education research always involves complex negotiations involving different framings of problems and goals, as well as different values. However, as scholars learn how to engage transformative research, they will grow to identify the binding relational characteristics that allow community members to work together and fight through disagreements and factions and across generations.

Capabilities Needed for Engaging with Communities

Two key sets of capabilities needed for community engagement are (1) learning how to join and pitch in to ongoing endeavors (language adapted from Rogoff, 2014; Rogoff & Mejía-Arauz, 2022); and (2) structuring opportunities for participation and decision-making at different phases of collaborative inquiry. Foundational to the capabilities that will build robust change-centered programs is sharp attention to matters of "how." Explicit models for doing collaborative research are vital to leaders and researchers who seek to develop the capabilities to do the work forming collaboratives, improvement efforts, and research programs.

Learning how to join and pitch in.

The first learning problem for community engagement is joining communities with an eye toward identifying the priorities, concerns, and dreams that are important to members and learning how to approach ongoing endeavors and people's perspectives on them with both curiosity and humility. Our thinking here is inspired, in part, by Rogoff's model of Learning by Observing and Pitching In (LOPI) to family and community endeavors (Rogoff, 2014; Rogoff & Mejía-Arauz, 2022), which speaks to how outsiders might learn to engage with communities.

Learning Domain 1:

Community Engagement

Joining a community as a researcher may happen in different ways, either through a direct approach from the outside to an insider, by becoming part of an ongoing community endeavor, or from within a community of which you are already a member (Ghiso et al., 2019; Penuel & Gallagher, 2017). It is especially important not to assume either that researchers are not members of communities (York et al., 2020) or that a project aimed at equity needs to be initiated by the researcher (Gutiérrez & Jurow, 2016; Sannino et al., 2016). Even from the inside, joining involves a complex renegotiation of roles that requires both sensitivity and skill (Grant et al., 2008).

Joining a community, especially as a partial outsider, is made easier if you can see how to immediately contribute to ongoing endeavors in the setting. These activities may or may not be related to any research project that might ultimately be conducted as part of a partnership (Downing-Wilson et al., 2011).

Providing opportunities for learning experiences like the following might assist in the task of pitching in to help that lays a groundwork of trust.

- Reading and learning about histories of specific communities and their efforts to promote educational justice (Montaño Nolan et al., 2019)
- Attending and contributing to events in communities
- Setting up meetings with community, school, district, or college leaders to introduce yourself and learn about the organization and its priorities (Penuel & Gallagher, 2017)
- Designing, conducting, and analyzing data from empathy interviews with members of a community, seeking to understand the experiences, feelings, and differing perspectives of people related to an issue or concern (Ruiz et al., 2021)
- Shadowing community-based providers of services (Stewart et al., 2020)

Structuring opportunities for participation and decision-making in collaborative inquiry.

The past two decades have witnessed a significant rise in participatory research methods in education that offer new tools and frameworks to scholars to explore and build on conceptual innovations by structuring opportunities for community engagement and collective decision-making. In this section we highlight examples of the kinds of approaches that should find their way into preparation programs aimed at transformative research.

There are multiple approaches to participatory research that a researcher can explore to gain a big-picture view of how to engage community members in different aspects of research. These approaches include social design experiments (Gutiérrez & Jurow, 2016; Gutiérrez et al., 2020), Design-Based Implementation Research (DBIR; Penuel et al., 2011), Improvement Science (Bryk et al., 2015; Peurach et al., 2022), Youth Participatory Action Research (YPAR; Mirra et al., 2015; Teixeira et al., 2021), Research–Practice Partnerships (RPPs; Farrell et al., 2021; Ishimaru et al., 2022), Community Research Collaboratives (York et al., 2020), and Inclusive Innovation (George et al., 2012), among others. Each of these approaches has specific ways to instantiate and improve collaborative and participatory action to achieve a common purpose, as well as different approaches to structuring participation. Familiarity with the strengths, limitations, and contexts where different models have proven useful for transformative research will support teams of researchers and their partners in selecting, adapting, or developing an approach of their own.

Learning Domain 1:

Community Engagement

At a more fine-grained level, researchers need a broad repertoire of strategies for engagement linked to different phases of research. A repertoire might include approaches for developing a shared understanding of an educational system's problems (Bal et al., 2018a), for engaging community members in envisioning futures for education beyond those that they have experienced (Chang et al., 2022), and for organizing codesign processes that account for differences in positional power among participants (Ishimaru & Takahashi, 2017). Scholars who are engaged in participatory research also need to devise means of preparing community members for the research endeavor itself and for the challenges they might encounter within it (Kirshner, 2008). In later phases of research, transformative research often entails collaborative sensemaking, for which intentional design is needed to ensure that different voices are reflected in what is written or communicated beyond the research group (Campanella et al., 2022).

Such repertoires may involve specific techniques for representing systems, such as a Fishbone diagram (Bush-Mecenas, 2022), an activity systems model (Bal et al., 2018b), an actor-network diagram (Riedy et al., 2018), or a community equity assessment (Green, 2017). But no technique can be expected to work in all contexts at all times; skillful choice and application depend on knowledge and understanding gained from joining and pitching into community endeavors. Without attention to intentional design of spaces for participation, however, it is possible for patterns of inequity to perpetuate within collaborative research space (Diamond, 2021; O'Connor et al., 2011). Researchers also need specific strategies for facilitation that attend to power and equitable participation. Understanding and addressing power dynamics is critical to ensuring inclusive and effective collaboration in community engagement.

Among the opportunities learning programs might seek to provide are the following:

- Comparative analysis of different models of collaborative research (for an example of one comparative analysis, see Penuel et al., 2020)
- Engagement with collaborative reflection on conceptions of educational equity (Ryoo et al., 2015)
- Workshops to learn about specific strategies for facilitation that attends to power and equitable participation, such as those offered by the National Equity Project (Bocala & Holman, 2022)
- Apprenticeship to skilled facilitators of specific strategies, such as co-design (Örnekoğlu-Selçuk et al., 2023)

Learning Domains

Theoretical Pluralism



Learning Domain 2: Theoretical Pluralism

Theory provides an important resource for transformative research, as it does for all research. And, like all research, transformative research benefits both from development of theories and from the use (application and adaptation) of existing theories. Theoretical pluralism is the synergistic development and use of multiple theories, drawing on multiple perspectives, in a program of research.

Theory is a somewhat amorphous concept that has been hard to define in a way that reflects a full range of meanings. Among the most straightforward definitions is Maxwell's: "By 'theory,' I mean simply a set of concepts and ideas and the proposed relationships among these, a structure that is intended to capture or model something about the world" (2013, p. 48). Importantly for transformative research, he notes that "both existing theory and grounded [i.e., locally developed] theory are legitimate and valuable" (p. 49) and he highlights the importance of multiple perspectives in theory development, including those of local participants.

Theories are often described in terms of levels of abstraction, which refers to the distance between the phenomena being studied and the concepts/categories in which they are represented.

- Case specific theories stay very close to the data at hand, perhaps moving up one level of abstraction (e.g., from a transcript of interaction among teachers to a characterization of the interaction as one where teachers are offering alternative interpretations of students' work; this categorization could then be used to note similar instances and relate them to how teachers attribute responsibility for students' learning [Horn, 2007]). Much that might be described as locally developed theory—theory that integrates community members' understandings and explanations of phenomena they experience—would fit in this category, although it might well be informed by and contribute to middle-range and integrative theories.

- Middle-range theories (Merton, 1957) span different contexts and incorporate different levels of a complex system, "to understand and explain a limited aspect of social life" (Bryman, 2008, p. 22); for example, how meaningful restorative practices address racialized harms of discipline systems (e.g., Ko et al., 2024). Middle-range theories also include theories intended to help explain processes of institutional change and stability in educational systems (e.g., Anderson & Colyvas, 2021), as well as subject matter-specific theories, such as how to support students in learning to model complex systems in high school biology (e.g., Yoon et al., 2023).
- Integrative theories focus on a higher level of abstraction and provide frameworks or lenses from which one can view the world, like sociocultural theory, decolonial theory, or complex systems theory, as well as interdisciplinary constellations of theory, like those reflected in the Sciences of Learning and Development (SOLD; Lee et al., 2023). Such theories are integrative in the sense that they seek to account for a wide range of phenomena in their complexity, such as the ways thinking, perceiving, and feeling intersect in human development in learning within complex and changing ecosystems (Osher et al., 2020).

Most programs of research we consider transformative draw productively on multiple levels of theory from the perspectives of multiple research partners and of people who are part of the system and who are impacted by it. Jocson, Dixon-Román, and Jean-Denis (2020) also speak to the value of theory that grows from speculative inquiry, where we use what we've learned to re-imagine our future and to consider different time horizons for transformation. Our focus in this domain is on theories that seek to explain social phenomena, such as the types listed above. Theories about how to do research—methodological theories—are considered in Learning Domain 3.

Learning Domain 2: Theoretical Pluralism

Why Embrace Theoretical Pluralism?

Transformative research grapples with complex phenomena that benefit from multiple theories reflecting perspectives from different actors in a system, from different disciplinary perspectives, and from historical analyses that help us see how those phenomena came to be. Important roles for theory in transformative research include:

- Developing theories locally to understand and explain phenomena in particular context(s) and using those theories to develop, enact, and evaluate change efforts iteratively, thus engaging in further theory development, informed but not constrained by existing theories;
- Using and evolving existing theories to understand phenomena within complex systems, where theory is likely to play many different roles over successive studies, implicating multiple components of the relevant systems to enable sustainable change; and
- Contributing to existing theory in ways that allow others to benefit from what was learned in particular transformative programs of research, so they can adapt those theories to their own contexts (see Domain 6: Knowledge Mobilization).

As an illustration of the potential for complementary use of existing theories intended to support transformation of complex systems, consider the broad range of theoretical perspectives in the National Academy of Education's (Lee, White, & Dong, 2021) review of research on Educating for Civic Discourse and Reasoning. The transformative goal of NAEd's overall initiative is "to improve students' learning in civic reasoning and discourse by ensuring that the pedagogy, curriculum, and learning environments that they experience are informed by the best available evidence" (p. 6). The report drew on a range of existing theories that are relevant not just to improving learning in the classroom but to other components of complex systems that are necessary to sustain learning. These multiple categories included theories about: (a) the philosophical foundation of and moral reasoning in civics; (b) the history of education for democratic citizenship; (c) learning sciences and human development, including cognitive, social-emotional, ethical, and identity dimensions entailed in civic reasoning and discourse; (d) the role of learning and pedagogy across content areas in developing competencies required for civic reasoning and discourse; (e) pedagogical practices and how teachers learn; (f) learning environments, school climate, and other supports for civic engagement; (g) agency and resilience in the face of challenge for civic action across ethnic communities; (h) digital literacy and the health of democratic practice; and (i) broader ecological contexts that influence the ability of learning systems to support development of civic reasoning and discourse.

Learning Domain 2: Theoretical Pluralism

We need complementary theories to be able to explore the breadth of phenomena that we encounter. Lee et al.'s (2021) chapter in *Educating for Civic Discourse and Reasoning*, for example, draws on the SOLD framework as offering an integrative perspective for examining learning and development. But when discussing how to enact this framework in practice, the authors also call on middle-range theories that are specific to different subject matter domains. For example, they draw attention to the potential of pedagogies for supporting students in history classes engaging in learning how to source and contextualize texts (Monte-Sano & Reisman, 2016; Reisman, 2012; Wineburg, 2001). They also note the rich body of work related to how to support academically productive talk to build students' skills in deliberative dialogue, a mid-range theory that has been applied in multiple academic domains (Resnick et al., 2010).

Turning to local theory development and the supporting role of existing theory, the perspectives and ideas of local partners alongside academic researchers provide an important theoretical grounding for transformative research. Partners are often knowledgeable about their context and its varied histories and can also contribute to developing working theories for how to improve the systems of which they are a part. Transformative research calls for local partners to be active contributors to models for change (e.g., Bryk et al., 2015; Engeström et al., 1996) and for academic researchers to look for intellectual grounding in the ideas of people outside the academy (Cruz, 2008; Ghiso & Campano, 2024). As such, partners—whether youth, families, or community members—can be theorists alongside researchers. Bang and colleagues (2016) refer to such theories as collective theories of change which grow out of groups' felt experiences of a phenomenon.

Each actor in a system, including researchers, has a social location—often written about as positionality—that provides unique perspectives on phenomena. Positionalities can also reflect the operation of power (Collins, 1990; Harding, 2004) and make it difficult to understand or imagine others' points of view. Perspectives of people with less social power, as well as theories that draw attention to the operation of power, are particularly important for advancing equity goals in education (Vossoughi et al., 2016). Drawing on and eliciting different perspectives helps one to see phenomena in new ways that both identify issues and support redesign (diSessa & Cobb, 2004). It also helps envision more equitable relationships among researchers, families, communities, and schools (Bang et al., 2016) that enable learning and thriving.

Capabilities Needed for Theoretical Pluralism

We are not suggesting that any one researcher needs to (or can) be deeply familiar with the full range of theories beneficial for transformative research. We are suggesting that within a program of transformative research, a team is likely to need to draw on a rich and diverse array of lenses to support a deeper understanding of the complex processes and topics at hand and that researchers need to become prepared to engage productively in such collaborations.

Using and critiquing existing theory.

A good place to begin is with practice in selection and use of multiple theories relevant to a phenomenon of interest, which entails multiple capabilities. First is the ability to select, apply, and use theory as a lens to observe a phenomenon or as a tool for research design. Such application encompasses different aspects of inquiry, from framing questions and developing a literature review to developing and carrying out a plan for analysis using a theoretical framework. It also includes considering the research methods through which a theory can be put to work in understanding or explaining a phenomenon (as illustrated in Domain 3: Methodological Pluralism).

Learning Domain 2: Theoretical Pluralism

Second, adapting and developing theory typically involves putting theories in juxtaposition or applying theory to a novel phenomenon or context purposefully, to see where it may break down or need to be adjusted. Adaptation and development both depend on an ability to see how empirical evidence can push against assumptions and key ideas of a theory. Such challenges are more likely to yield new insights when investigators build on combinations of perspectives. And third, investigators need to be able to attend to and hold complexity, ambiguity, and contradiction, as a tool to help them develop theory in new directions. Focusing on adaptation and development can also develop investigators' fluency when discussing the strengths, affordances, and drawbacks of various theoretical lenses in explaining specific phenomena. Learning experiences relevant to these capabilities include providing opportunities for learners to:

- Interpret how theories are used within multiple research articles relevant to a phenomenon of interest, including ferreting out unarticulated assumptions and implications of theories and considering what is hidden or left out of view that could be important to understanding the phenomenon
- Apply and compare the implications of different theoretical lenses to phenomena scholars are encountering in the field.

Eliciting and making use of local partners' theories.

This capability means eliciting and working with the perspectives of local actors who are part of and impacted by the system, something addressed above in Domain 1: Community Engagement. It can also involve connecting local partners' theories to existing theories from academic research. For design-oriented researchers, it may also include learning to use specific kinds of processes for eliciting different perspectives in the context of building a shared understanding of problems and generating possible solutions to problems, which may fit within current systems or require their redesign, also addressed in Domain 1. Learning experiences include opportunities for learners to:

- Engage in participatory mapping of a system or design space; for instance, a conjecture map (Lee et al., 2022; Sandoval, 2014; Virkkunen & Newnham, 2014) of how a design might function to bring about a desired outcome, or a situational analysis (Clarke, 2003) of how multiple aspects of a system might shape a phenomenon
- Interview partners about how and why they accomplished something or engaged in a routine practice, how they learned to do it, and what factors enable and constrain their work
- Connect local theory to existing academic theories of learning and development or institutional change (Kirshner et al., 2021)
- Facilitate group sensemaking or cointerpretation of shared data (Cobb et al., 2013; Roderick et al., 2009)

Learning Domain 2: Theoretical Pluralism

Developing knowledge of and disposition to look broadly for existing theories to understand phenomena.

Organizing programs of study that ensure broad exposure to core bodies of theory relevant to transformative research (such as theories of learning and development, organizational and systems change, and the role of power in systems of subjugation and oppression) provides learners with preliminary knowledge about the affordances of a range of theories—knowledge that continues to develop over time. Engaging with particular programs of research, and the issues and phenomena they are pursuing, invites more focused exploration of relevant theories to complement and challenge one another. This can involve reading across subfields, to see what theories others have chosen and adapted for similar phenomena. It can involve working on a project where theories are being selected and adapted for new contexts, to learn what different lenses show and hide about phenomena. Important too is being able to “hold theories lightly,” that is, to maintain awareness that the lenses we are bringing to a new situation may or may not be useful for making sense of that situation and to be willing to reckon with the failures of lenses we’ve chosen for accounting for the phenomenon we are studying (Martela, 2015). Needed is a habit of mind or proclivity to reflect flexibly on the utility of theories in different situations, as well as awareness of the limits of theory (Schneider, personal communication).

Useful learning experiences include opportunities to:

- Engage or develop reading lists, study guides, reading protocols, and form book/article study groups
- Take interdisciplinary courses, where a range of theoretical perspectives are considered
- Participate in one or more large projects in which multiple disciplinary perspectives and associated methods are being used to explore a phenomenon or issue (e.g., Reardon & Stuart, 2019; Weisner, 2021)

Developing depth of knowledge in a field or body of work.

As learners progress through a program, it is useful to develop expertise in particular areas of theory relevant to their interests. Understanding a field or body of work is about both knowing ideas and theories, and also understanding their genealogy; that is, placing ideas within the histories of ideas in a field. This implies taking a long view and tracing the evolution of ideas over time, and having a critical perspective on the canon—to know the “classical” works in a field while being able to analyze who has been included or excluded in the core canon around a topic. Providing useful learning experiences includes:

- Support for learners in developing in-depth knowledge through coursework and access to relevant learning opportunities elsewhere (including apprenticeships), and in locating networks of colleagues who specialize in a field of interest of the learner.
- Cultivate programmatic norms where respectful challenges to established perspectives are welcomed and explored.

Learning Domains

Methodological Pluralism



Learning Domain 3: Methodological Pluralism

Engaging with diverse research methodologies, or methodological pluralism, refers to the synergistic use of multiple methodologies in a program of research as it unfolds over time. Methodologies guide the selection or development, use, and justification of methods for addressing different kinds of research questions. Methods are the specific tools—of data collection or construction, analysis, interpretation, synthesis, reporting and evaluation—through which research is enacted.¹ In any program of research, methodologies and methods go hand-in-hand with the development and application of substantive theories. Given the complex nature of educational systems, as well as the complexity of human learning and development, methodological pluralism is essential to support diverse community members and research partners in developing the understandings necessary to enable and sustain meaningful change.

The term methodology is often used to refer to the study of methods and methodologies, including their histories and philosophical underpinnings. Methodologies reflect underlying epistemologies, whether these are explicitly stated or not. Epistemologies entail philosophical assumptions about what knowledge or knowing is, how we come to know something, and how we ground or justify conclusions about what we know. Many methodological traditions are informed by multiple epistemological perspectives, as they have evolved over time or as part of ongoing debates within traditions. It's important to acknowledge that the relationship between methodologies and epistemologies is far from straightforward. Methodologies are the evolutionary outcomes of dynamic, sometimes disputatious, traditions. As Abbott (2004) describes it: "Methodological traditions are like any other social phenomena. They are made by people working together, criticizing one another, and borrowing from other traditions. They are living social things, not abstract categories in a single system" (p. 15). To further complicate the situation, methodologies as articulated can be shaped by the disciplines and contexts in which they are used, the substantive theories brought to bear in addressing research questions, underlying beliefs about the nature of social reality, geographic borders, ethical commitments, and so on. Thus, being more explicit in teaching and scholarship of epistemological assumptions and ethical commitments is important for transformative research.

¹ A still widely cited book by Crotty (1988), for instance, offers examples of the difference between methodologies (e.g., experimental research, ethnography, action research, discourse analysis) and methods (e.g., sampling, observation, interview, focus group, content analysis, statistical analysis) which can be employed within multiple methodologies.

Learning Domain 3: Methodological Pluralism

Why Embrace Methodological Pluralism?

Different methodologies—and the epistemologies underlying them—offer different lenses through which we can understand and seek to transform the worlds we inhabit. Like all lenses, they are partial; they enable us to raise and pursue certain kinds of questions, to explore different theoretical perspectives, to interact with and learn from research partners and from school and community partners in particular ways, to study phenomena on different scales of time and space, and to imagine different ways to foster change. Being able to address educational problems and learning opportunities through multiple lenses—and to collaborate meaningfully with research partners who have different types of expertise—is crucial for transformative research.

For example, a program of research involving a partnership among a large school district, a community-based advocacy group, and a local university research team illustrates the kind of community-engaged, multi-methodological research program we consider transformative. Looking across the studies undertaken by this partnership, one can begin to see how their program of research unfolded iteratively over time, attended to different components of a complex educational system and its members, and engaged consistently in research practices that supported mutual learning. While we foreground the methods and methodologies employed by this research team, it's important to note that they were interwoven throughout with theory about the phenomena in question, both locally developed theories and external theories locally applied to address community questions.

The program focused on the role of restorative approaches in school disciplinary practices (Anyon et al., 2018). The work began with a series of relationship-building and goal-setting meetings between university faculty and community groups, the teacher's union, and district leaders. This was followed by statistical analyses of the district's administrative data to better understand the nature of racial disparities in disciplinary practices and to explore the relationship between restorative practices and suspensions. Hypotheses guiding these analyses were informed by meeting dialogue that illuminated competing explanatory frameworks for the racial disparities (Anyon et al., 2014, 2016).

The next set of studies focused on understanding the features of restorative practices and the conditions that supported them at schools known through statistical analysis or partners' recommendation to have low suspension rates and exemplary disciplinary practices. Through focus groups, semistructured interviews, participant observations, and comparisons across different school communities they were able to establish themes regarding restorative approaches that were efficacious across schools (Anyon et al., 2018; Wiley et al., 2018). These were used to inform district policy and support educator learning.

A third set of studies took an explicitly critical turn, including critical discourse analyses of rationales in office referrals for discipline for black girls (Annamma et al., 2019) and of school board discipline policies (Wiley et al., 2024), and critical race quantitative analyses “to consider the intersectional impact of gender and dis/ability type on school discipline outcomes for Black students” (Samimi et al., 2023, p. 456). Studies like these give local participants an opportunity to reflect critically on their own understandings and practices.

Learning Domain 3: Methodological Pluralism

It has become commonplace to rely on the terms “qualitative” and “quantitative” to characterize different methodologies in education research. While useful for some purposes, these terms seriously under represent the rich range of methodologies available to education researchers, glossing over differences that can matter for transformative research. Similarly, while reliance on the term “mixed” draws attention to the value of pluralism, it glosses over the many ways in which methodologies can be combined, synergistically, in programs of research. A more nuanced language to characterize methodologies is crucial for noticing the distinct affordances of different methodologies (Moss & Haertel, 2016).

Capabilities Needed for Methodological Pluralism

While methodological pluralism, as we use the term, refers to programs of research involving multiple researchers who bring differing expertise, there are nevertheless capabilities of individual researchers that prepare them to contribute collaboratively to such multi-methodological programs of research. The capabilities described here assume and extend the capabilities described in the first two Learning Domains for Transformative Research with particular attention to methodological pluralism. They are (a) participating knowledgeably in designing transformative research, (b) systematically reviewing relevant research, (c) developing methodological expertise, (d) contributing to general knowledge, and (e) engaging in comparative and critical analysis.

Participating knowledgeably in designing transformative research.

Scholars preparing to engage in transformative research should be able to contribute to and eventually co-lead the designing of research studies and programs. Designs for transformative research typically unfold over time as understandings of the focal issues and contexts deepen (as illustrated in the research program on restorative approaches to discipline above). However, research proposals for funding, fellowships, or progress-toward-degree require that collaborators anticipate how a program of research is likely to unfold. While such designs may well evolve as circumstances change, having a compelling initial sketch is valuable for research proposals. Here we speak to methodological design issues, reminding readers that research design is integrally related to the roles of theory about the phenomena as described in Domain 2 and the structured opportunities for community engagement described in Domain 1.

In designing programs of research, it is useful to be able to engage collaboratively in (a) mapping the complex system(s) in which an educational phenomenon of interest is embedded (e.g., Barbrook-Johnson & Penn, 2019; Clarke et al., 2022), to identify both key people and elements of the system that need to be taken into account in enabling transformation; (b) sketching one or more theories of action or mechanisms through which change might be enabled (Bryk et al., 2015; Pawson, 2006, 2013), and then (c) developing an initial outline of the kinds of research (methodologies and theories) needed to inform and evaluate the change effort.

Learning Domain 3: Methodological Pluralism

It's also valuable to have a sense of the purposes different methodologies might serve, alongside theories of the phenomena, to inform directions for research and to identify potential research collaborators. That requires conceptual awareness of the affordances of multiple methodologies and epistemologies, as well as of who has those complementary capabilities. By way of illustration, here are some distinct methodologies (that the qualitative/quantitative dichotomy glosses over) organized in terms of different purposes they might serve. Each has been put to work in understanding or enabling change in complex systems. The references point to places where researchers can go to learn more:

- Participatory research, including social design experiments (Gutiérrez, 2023), improvement research (Bryk et al, 2015; Hinnant-Crawford, 2020; Pourach et al., 2022), participatory design (Bang & Vossoughi, 2016), participatory action research (e.g., Fine & Torre, 2021; Lenette, 2022), and Design-Based Implementation Research (Fishman et al., 2013), informs action-oriented coplanning and coenactment of research with school and local community partners that can also support collaborative multi-methodological design.
- Ethnographic research (Hammersley & Atkinson, 2007; Madison, 2020) can allow research partners to come to know a community and to trace the evolving cultures, patterns of interaction, shared meanings and values, and how individuals and groups participate differently in them. Especially relevant are ethnographic methods like critical design ethnography (Barab et al., 2004) or collaborative autoethnography (Chang et al., 2013) that actively involve local participants in the research process.
- Randomized controlled trials, could explore the generalized impact of a curricular intervention across community contexts. Such research can be important for informing decisions that leaders make regarding adoption of curriculum materials, programs, and practices (Dynarski, 2008). In addition, when studies also include data on implementation and explore heterogeneous effects of interventions with different populations, they can add important information that decision-makers typically want regarding how interventions work with populations like their own (NASEM, 2022a). However, as a recent report of the National Academies of Science, Engineering and Medicine (NASEM, 2022) argued, interventions, and the RCT designs that analyze their effectiveness, however well enacted, may not be sufficient to support sustainable change within contexts. The NASEM authors called for “expanding the choice of research designs for addressing research questions that focus on why, how, and for whom interventions work” (p. 4). When RCTs are organized around questions that matter to interest holders,² and when they gather and analyze data to help explain heterogeneous effects (i.e., what works, when, and for whom), such studies can contribute to knowledge that informs systems transformation.

² We use the term interest holder here and throughout this report to refer to any group with a legitimate interest in the educational matter being addressed in a research project. These interests derive from the fact that they are responsible for or impacted by decisions made related to the matter and that might be informed by research evidence. For a related definition in the health field, see Akl et al., 2024.

Learning Domain 3: Methodological Pluralism

- Methodologies informing the why, how, and for whom of change efforts include the following, most of which could not be usefully classified within the qualitative/quantitative dichotomy:
 - process tracing (Beach & Pedersen, 2019; Bennett et al., 2019) to identify context-specific causal mechanisms;
 - comparative case studies of different sorts (e.g., Rihoux & Ragin, 2009; Bartlett & Vavrus, 2017) to understand how different configurations of conditions can produce different or similar outcomes;
 - social network analysis (Finnigan et al., 2018), agent-based modeling (Miler & Page, 2007, or actor-network theory (Latour, 2005; Fenwick & Edwards, 2010) to trace patterns of interaction within and across complex systems; and
 - critical methodological theories (Dixon-Roman, 2017; Matias, 2021; Young & Diem, 2023), along with decolonial and Indigenous methodologies (Chilisa, 2019; Patel, 2016; Tuhiwai Smith, 2023; Tuhiwai Smith et al., 2019), to ferret out the workings of power within systems, including the research enterprise itself, where exploring different ways of knowing and being can expand our understandings of ourselves and others and our relationships with the social and ecological worlds we inhabit.

Methodologies like these enable alternative ways of conceptualizing and promoting change, from large-scale interventions to smaller shifts in routines or resources to action-orienting critical reflection on current practice.

While this kind of conceptual awareness grows over time as one reviews existing research in areas of interest and participates in research communities that embrace pluralism, it is also useful to have access to resources that can enhance awareness of alternatives.³ Some scholars see this as an ethical obligation to illuminate otherwise invisible exclusions (Abbott, 2001; Bowker, 2005; Moss & Haertel, 2016).

A useful way to support learning about multi-methodological research design is to provide opportunities for learners to:

- Observe, critique, and engage in the design of community-engaged multi-methodological, multitheoretical research and action agendas around phenomena of interest to see pluralism in action. To that end, learners might
 - participate in the development of a proposal for a research project;
 - study, critique and expand on what was done in an existing research project (like the example on restorative justice above), and/or
 - imagine a project of their own with feedback from mentors, peers, and interest-holder colleagues.
- Take an introductory course intended to introduce different methodologies and epistemologies, perhaps with some of the above tasks as course projects.

³ Comparative overviews of a broad range of methodologies can be found in Cohen et al. (2017) and Moss & Haertel (2016); comparative overviews specific to subsets of more recently emerging methodologies can be found in Byrne & Ragin (2009) on case study research; Escobar (2018), emphasizing approaches to research outside the North American and European canon; Fenwick et al. (2011, 2015) on methods that explore evolving interactions among the social and material worlds; and Matias (2021) and Young & Diem (2023), on critical methodologies, to name a few.

Learning Domain 3: Methodological Pluralism

Systematically reviewing relevant research.

It's important to be able to identify and review existing research to see how a phenomenon of interest has been studied, including from different methodological and theoretical perspectives, as well as how community partners were engaged. Like primary empirical studies, systematic reviews of research are expected to be explicit methodologically—that is, about processes of searching and selecting, analyzing, and synthesizing the material reviewed—so that readers can evaluate the warrants underlying the learnings and conclusions. While the most prominent methodology for systematic reviews, meta-analysis, is intended for studies relying on quantitative results primarily from experimental studies like RCTs, there are other well-developed review methodologies conducive to methodological and theoretical pluralism. Useful overviews can be found in Booth et al. (2022), Gough et al. (2017), Suri (2014) and in guidance provided by major international review collaboratives (see Cochrane-Campbell Handbook for Qualitative Research Syntheses). Many of these resources speak to the role of community members in the review process. Reviews of research support others in learning from existing research whether via a published research review, a workshop for people in schools or communities with an interest in the research, or some other means.

This capability could be supported by opportunities to:

- Learn about the methodologies for systematic reviews, especially methodologies that support reviews of studies drawing on different methodologies. Consider how the review methodologies support reviewers to work with school, family, and community partners, frame questions, search for and select texts based on explicit inclusion criteria, analyze and synthesize included studies, and evaluate the validity of the findings from the review.

- Develop systematic reviews of existing research related to a phenomenon of interest, with critical attention to how studies from different methodological traditions have informed it. The outcome of such reviews can be directly relevant to an existing project, can evolve into a manuscript to submit to a journal, and can be shared in multiple formats, including in workshops and discussion groups, relevant to different audiences.

Developing methodological expertise.

Expertise, including methodological expertise, refers to how researchers frame and pursue one or more areas of interest and strength, with the goal of being able to support others' learning and to adapt and innovate in response to new circumstances. Thus, methodological expertise intersects capabilities that cut across all our Domains; reflects a researcher's own history, positionality, and evolving goals for the kind of work they want to engage in; and takes advantage of the resources available in their learning environments.

Deep methodological expertise entails the development of adaptive—not just routine—expertise that allows for creativity in problem solving in novel situations (Hatano & Inagaki, 1986) and preparation for future learning (Bransford & Schwartz, 1999) when the structured resources and apprenticeship experiences of graduate school are no longer available. This kind of expertise requires time and benefits from opportunities to use methodologies in a wide variety of contexts, underscoring the need to imagine preparation for transformative research as an ongoing endeavor, not one that takes place only in graduate school.

Learning Domain 3: Methodological Pluralism

In the context of pluralism, expertise requires being able to contribute to a dialogue with researchers who have different methodological and epistemological orientations, to consider how other methodologies complement and challenge one's own, and to engage in collaborative problem solving. It requires being able to communicate with different audiences—educators and local community members alongside other researchers—in ways that allow them to participate in and learn from the research process.

The development of methodological expertise might be supported by opportunities to:

- Engage in course sequences or guided reading and practice designed to support the development of deep expertise in one or more methodologies. In service of both pluralism and deeper learning, such learning experiences should also include reference to contrasts with key alternatives and criticisms from other methodological and epistemological perspectives.
- Participate in multi-methodological research projects where the methodologies being learned can be put to work in conjunction with relevant theory in serving the project's goals through all aspects of the research process from framing questions to sharing findings with different community members, educators, and policy makers and considering action implications.
- Serve as a teaching assistant or intern in a course or workshop where students are learning the methodology, with opportunities for reflection on pedagogy with experienced teachers.

Contributing to general knowledge.

Also important for programs of transformative research is being able to consider how what was learned in particular contexts of research might be relevant in other places and times (Byrne, 2013) thus contributing to general knowledge without losing sight of the particular (Tsoukas, 2009). One way to conceptualize the relevance of a particular research study or program of research is to assume it's up to readers to consider the relevance to their own contexts. The authors' role is to provide sufficient details about the studied context to support readers' judgments. While useful for questions of elsewhere and elsewhen, this approach does not support learning across many similar or complementary studies—something that is crucial for transformative research to grow as a field. Conventional conceptions of generalization, which rely on a sample-to-population logic, have limited relevance. As Moss and Haertel (2016) note, it can be argued that all studies, including those involving random sampling, are situated in time and place and framed with particular questions in mind (e.g., Campbell & Stanley, 1963; Gomm et al., 2000; Ragin & Becker, 1992). Consequently, all studies can be considered as cases or case studies (Ragin, 1992). In order to develop knowledge across multiple studies, a different conception of generalization is needed: one that relies on theory to carry the generalization. Some methodologies like those underlying comparative case studies (Bartlett & Vavrus, 2017; Byrne & Ragin, 2009), and systematic reviews (see above) can support this work directly (see, e.g., Marsh's 2012 review of studies promoting data use in school for an approach integrating complementary studies that address different parts of a theory). Moss and Haertel (2016) provide an overview of theory-based approaches to generalization.

Learning Domain 3: Methodological Pluralism

An experience that is valuable for learning how to contribute to general knowledge is:

- Review examples of and engage in the development of comparative case studies of transformative work to understand and develop more general theory without losing sight of the particular. Comparative case studies can be developed through systematic reviews (e.g., Hammond et al., 2020) or through primary empirical work where research questions and methods are designed a priori to enable such comparisons (e.g., Bartlett & Vavrus, 2017; George & Bennett, 2005; Rihoux & Ragin, 2009). Importantly, they can also illustrate the ways in which theories relevant to the phenomena of interest are integrated with methods, methodologies, and epistemologies that serve them.

Engaging in comparative and critical analysis of methodologies.

It is valuable to complement growing methodological expertise by seeking challenges from others who draw on different methodologies and have different beliefs about knowledge. Comparing approaches—in terms of how research quality is judged, how researchers and participants interact, how external and local knowledge are used, and how change is understood and made possible in different methodologies—can illuminate the benefits and limitations of each approach. It also supports researchers in considering the benefits and consequences of different approaches for local communities and in exploring methodological synergies and innovations.

Over time, it is also beneficial for scholars to develop a critical understanding of the field's incentives for different methodological approaches. Requests for proposals from federal agencies and private foundations, journals and special issue calls, and hiring within universities all signal what kinds of approaches are valued. In many cases, these incentives are responsive to currents in the field, but some can have the effect of narrowing the field's approach and limiting the possibilities for adopting a pluralistic stance toward methodologies. Critical analyses of canonical methodologies and epistemologies can be found, for instance, in Byrne and Ragin's (2009) critique of experimental design from the perspective of case-based methods and complexity science, in Dixon-Román's (2017) quantitative approaches to critical inquiry from feminist new materialist perspectives, in Reiter's (2018) focus on geopolitics of knowledge, in Tuhiwai Smith's (2023) decolonial critique of the "ethnographic gaze," and in Zuberi and Bonilla-Silva's (2007) exploration of the relationship between privileged methodologies and racism. Becoming familiar with the critical dialogues about the shape of the field, and considering the relevance of the dialogues to one's own practice, prepares researchers both to make decisions about the direction for their own work and, as opportunities arise across a career, to participate knowledgeably in dialogues about incentives, barriers, and other factors that shape the direction of the field.

Learners can benefit from opportunities to:

- Engage in comparative critical study of prominent epistemological and methodological traditions along with examples of relevant research. Consider traditions within and beyond the canon of social science prominent in North America and Europe (e.g., Escobar, 2018; Reiter, 2018).
- Contribute to a research team or institute that is using different methodologies and/or epistemologies, both within and across teams and projects, to study the same phenomenon.

Learning Domains

Ethics in Research Practice



Learning Domain 4: Ethics in Research Practice

Ethics encompasses questions about how we ought to act—both as researchers but first and foremost as human beings—and about our obligations to others that arise from our relationships. It is a crosscutting aspect of transformative research that is present in all that we do and how we carry out our work. In transformative research, community and school partners typically bear more risk than researchers do, when studies fail to communicate back findings in a timely, relevant fashion or when interventions tested do not produce desired results (Chicago Beyond, 2019). That said, the uncertainties and long timeframes associated with partnership work present risks to faculty seeking tenure in universities, because they may publish less often or on different timelines (Shirrell et al., 2023).

Ethics encompasses how researchers ought to conduct themselves in any research involving human participants, as well as some dimensions of conduct specific to transformative research. These dimensions pertain to our engagement of participants as partners in different aspects of research, our obligation to look out for partners' well-being and to be aware of our positionality and power as researchers, our consenting processes, and our accountability to the communities where we do research. By positionality, we mean the social locations of the identities we hold in relation to systems of power. Another area of ethics pertains to interdisciplinary collaborations, which present distinctive challenges and opportunities for building and maintaining ethical relationships.

Why Is Ethics in Research Practice Important?

Ethics is central in transformative research because such research aims to transform relationships among children and youth, educators, families, and communities. Centering questions of ethics invites us to consider how we ought to collaborate in supporting transformation in those relationships. An ethics for transformative research begins from a premise that being in relationship is fundamental to who we are as people (Buber, 1923/1970; Cajete, 2000; Hanh, 2017). Values of care, compassion, and responsibility are central in transformative research as well as in the profession of education more broadly, but it is critical to consider that these values are enacted within inequitable political and economic systems (e.g., Singleton & Mee, 2017; Tronto, 1993, 2010) and within societies that, for the most part, do not extend obligations of care to other species, which are central to many ethical systems, including many Indigenous systems (e.g., Santiago-Ávila & Lynn, 2020).

Learning Domain 4: Ethics in Research Practice

As researchers seeking to engage in transformative research, questions of ethics call our attention to how our actions can bring about relations of care, express compassion, and reflect our responsibility for our collective flourishing as human beings, not simply for the immediate goals we have for our research. These obligations encompass but go beyond the ethical principles of the Belmont Report to which Institutional Review Boards for the protection of human subjects hold themselves accountable. The Belmont Report's principles of respect for persons, beneficence, and justice were designed to prevent specific harms—such as those from the Tuskegee Syphilis Study, where an available treatment was withheld from Black male research participants so as to study the natural course of the disease—from occurring again. However, these principles draw sharp boundaries between research and practice and do not speak to how to avoid harms to communities (Friesen et al., 2017) that can occur throughout the research process. Relatedly, transformative research demands an ethics that recognizes the right of communities to refuse research that has the potential to do harm to them (Tuck & Yang, 2014), that perpetuates colonial relationships with Indigenous and other communities (Tuhiwai Smith, 2007; Tuck & Guishard, 2013), or that raises questions focused on deficit- or damage-oriented stereotypes rather than on systemic inequities and community strengths and resources (Tuck, 2009).

An ethics of transformative research calls on research partners to imagine and engage new relations, between research and practice, among institutions and the communities they serve, across generations, from which all can learn. For researchers, this entails recognizing that we can never stand outside of relations, as neutral observers, and so the question for us becomes how to be in relation as we come to know a situation, a community, or a system. This requires us to consider how an ethics of care can be rooted in an understanding of the sociopolitical contexts of children, families, and educators we partner with and seek to serve through research (Bang et al., 2016; McKinney de Royston et al., 2017; Vakil et al., 2016; Watson, 2018). When partnering with families, communities, educators, or organizations with divergent values and goals (see discussion under Domain 1), or who hold values or beliefs that conflict with one's own, it is important to consider how to do so ethically in a way that both maintains integrity to one's own ethical principles alongside a willingness to understand and be challenged by other perspectives.

Collaborations across theoretical, methodological, and professional boundaries present opportunities for building ethical relations among colleagues with different expertise. They require ethical sensitivities for respecting the expertise and dignity of others and a willingness to engage in mutual learning that are similar to those needed in partnerships with schools and communities. In addition, it is critical to maintain humility in transformative research, with deep appreciation for the difficulty of our undertaking and for the reality that achieving transformation is a complex, slow undertaking with much uncertainty, and that there are limits to what we can know at any given point in time.

Learning Domain 4: Ethics in Research Practice

Capabilities Needed for Ethics in Research Practice

Approaching participants from an asset point of view.

In transformative research, researchers need to develop an orientation that treats the perspectives, experiences, and contributions of partners with respect and dignity. To adopt such an orientation requires adopting a view of participants as intelligent and capable (Campano et al., 2015), with a recognition also that participants bring different experiences, knowledge, commitments, and concerns (de Castell & Jenson, 2010). It also involves observing, witnessing, and learning from partners (Winn & Ubiles, 2011). All of these are contingent on developing an asset perspective toward participants, that is, one that highlights their capabilities rather than their deficits in contributing meaningfully to transformative research.

Experiences that may be beneficial in helping develop an orientation to approach participants from an asset point of view include providing learners with opportunities to:

- Identify and reflect on acts of deficit thinking and how they lead to actions that harm or perpetuate ideologies and stereotypes of groups and communities (Valencia, 2010)
- Gather oral histories and conduct neighborhood walks in communities (McKenzie & Schuerich, 2004)
- Conduct and synthesize interviews with multiple partners related to a design goal or problem intended to elicit a diversity of visions for change

Anticipating and monitoring benefits and risks of research.

Researchers also need to have a deep understanding of how to apply the principle of beneficence in the conduct of research. As called for in the Belmont report (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1979), beneficence refers to the idea that potential benefits to participants should be maximized and risks of harm minimized. In transformative research, benefits are intended for individuals, organizations, and communities, not just for individuals in isolation (Figueroa, 2016; Henrick et al., 2023; Kelly, 2019). Thus, learning how to think about different levels of potential benefit and how to assess benefits is a key ethical capability for transformative research.

Anticipating risks and developing plans to reduce harm also requires attention to the risks faced by participants based on their own positionalities with respect to systems of unequal power and oppression as well, asking questions such as “What is safe to share and what isn’t?” and “Who is made vulnerable by the research?” (Cahill, 2007). It also requires researchers to be able to communicate to participants an understanding of their own positionality relative to systems of power (Cahill, 2006). In intervention research, it requires skill in codesigning with others in ways that support systemic transformation and that attend to imbalances in power (Kelly, 2019; Zavala, 2016). This can be complex in settings where we are engaging with communities who may hold different beliefs about equity and power than we do. Further, in facilitating participation, researchers need to be able to anticipate at least some of the potential risks and tensions associated with how different people are likely to interpret data and act on it (Glass et al., 2018; Minkler, 2004) and to remain vigilant and in dialogue about risks and benefits as programs of research evolve and what is learned is disseminated within a community and beyond.

Learning Domain 4: Ethics in Research Practice

An example of how transformative research can elevate explicit discussions of the risk and benefits of being part of research comes from a study of a partnership that included researchers from the Research Alliance for New York City Schools, a community organization, and several schools (Villavicencio et al., 2023). This partnership was focused on supporting and studying a schoolwide program focused on racial justice in schools. The team anticipated the need for up-front considerations of different perspectives on the work, as well as resistance from different quarters (e.g., school leaders, selected families). Anticipating these risks, the partnership required the commitment of a district leader to support the work of the program and encourage school-level implementation, while also acting as a buffer to resistance. The team also involved soliciting and using feedback on measures, which led to changes to how the team collected identities of participants and to the burdens of data collection. Further, the team involved partners in making meaning of the data and performed member checks before reporting findings publicly. As part of this work, they attended to and protected participants' anonymity during joint sensemaking sessions and in reporting. Further, they collaborated with other interest holders on how to share results to promote their uptake (see also Lezotte et al., 2022).

Experiences that may be beneficial for learning to anticipate and articulate risks and benefits of research include opportunities to:

- Work with community leaders, families, and educators to understand both the perceived benefits and risks of research, and, if relevant, the benefits and risks of proposed interventions and engagement with findings.
- Apprentice to codesign a research study, including framing research questions, developing consenting practices, and determining how data will be managed.
- Submit proposals to IRBs, both at one's own institution and at sites of practice. Good protocols educate IRBs on what is and what isn't acceptable in specific domains (Derry et al., 2010).

- Design and implement research such that all research partners, including researchers, have opportunities to reflect on the process of the research and how it is contributing to change or hindering it, as well as to reflect on how relationships among researchers, educators, and communities are being cultivated through research.
- Engage in routine dialogue with research partners, community participants, and trusted colleagues about the risks and benefits of decisions made throughout the research process.

Maintaining thoughtful and continuous consent.

Another set of ethical capacities pertains to negotiating free and informed consent throughout the research process. To say consent is freely obtained requires a set of conditions that in most research is rarely obtained, as power inheres in all relations. Even when researchers do not coerce participation, other participants can do so explicitly or by exerting subtle pressure (Kelly, 2019). In addition, deciding on compensation can be tricky. On the one hand, compensation should be sufficient to offset time spent and risks faced for participation but also should consider the outsized role compensation might play in motivating participants to be part of research (de Castell & Jenson, 2010). The Belmont report notes that informed consent is most salient and obvious at the start of a research project, when researchers seek permission to include participants in their study (Friesen et al., 2017). However, the dynamics of consent demand continuous attention to the willingness of participants to take part in a long-term study or partnership (Vossoughi & Escudé, 2016) and to illuminating unanticipated risks that may arise as the research unfolds. Last, in projects that involve youth participatory action research, special procedures are required for preparing youth researchers to obtain informed consent from participants in their studies (Teixeira et al., 2021; Whittington, 2019).

Learning Domain 4: Ethics in Research Practice

Negotiating consent is crucial in ethical data management and sharing. The push for “Open Science” promotes free data sharing to advance knowledge (Grand, 2015) but can conflict with agreements that give communities control over their data (Nelson et al., 2015). For example, Grant et al. (2023) describe a complex negotiation required between a school district and a research team about how to reduce risk of individual teachers’ being put at risk for how they implemented an SEL program while making datasets available through the Open Science Foundation. Researchers must understand these tradeoffs and develop skills in crafting collaborative data agreements. As Artificial Intelligence (AI) becomes more common, these agreements are vital since data used to train AI models often require handoffs to different researchers not directly involved in collaborative partnerships. Researchers must also learn emerging models for building and using datasets that maintain privacy (Geyer et al., 2017). Additionally, understanding frameworks like Indigenous data sovereignty offers important ethical perspectives on data stewardship that researchers need to grasp (Walter & Suina, 2019). Balancing these factors is key to being responsible and ethical partners in research.

Experiences that may be beneficial for developing responsive and continuous consenting include opportunities to:

- Document and reflect on the nuances of negotiating consent and revisiting it.
- Participate in negotiations of access to and use of data from research studies.

Practicing answerability.

Researchers must develop practices for answerability to the schools, families, and communities they serve. Answerability involves a necessary responsiveness to people and communities’ hopes and concerns, countering colonial research approaches (Patel, 2014, 2016). This responsiveness is an ethical obligation in transformative research, fostering a “subject-to-subject” relationship rather than treating people as “objects” (Akkerman et al., 2021). Two key practices are regular pauses and checkpoints in participatory research to solicit input and offer opportunities to halt the research, and participatory review of processes to ensure inclusivity and disrupt inequity. These practices embody the ethical ideal of self-reflexivity (Stilgoe et al., 2013), and they extend to collaborative review of participatory processes themselves (Campanella et al., 2022; Ishimaru & Bang, 2022). Reflexivity is crucial because the potential for collaborative research to transform relationships is not guaranteed, but contingent (Diamond, 2021). It also entails accountability for meaningful change. That means designing and enacting research so as to understand the extent to which the desired solutions to problems or benefits to the community are being accomplished.

Learning Domain 4: Ethics in Research Practice

Experiences that may be beneficial for supporting answerability to communities include opportunities to

- Participate in negotiating a data agreement where relevant and authorized interest holders need to be identified, and where community interest holders agree with researchers on how data will be analyzed and presented in a study (Nelson et al., 2015; Grant et al., 2023).
- Reflect on ethical-political dilemmas that can emerge in community-engaged research (London et al., 2022).
- Cofacilitate a participatory analysis of data that attends to power, paying attention to the potential for reproducing harms in how analyses are conducted and presented externally.
- Present research and make it public in accessible ways to realize reciprocity (Campano et al., 2015).
- Participate in codesign and ongoing evaluation of the extent to which intended improvements are manifest in the system and consider next steps accordingly (Henrick et al., 2023).

Engaging across differences with generosity.

Working across different theoretical, methodological, and professional boundaries requires distinct ethical sensibilities. These include intellectual generosity, a mix of confidence in one's contribution to the endeavor with humility as to the partiality of one's knowledge, flexibility to think beyond intellectual boundaries of one's disciplines, and intellectual integrity (Balsamo & Mitcham, 2010). It is critical, too, in negotiations of divisions of labor in interdisciplinary projects, that they not reinscribe disciplinary hierarchies that reinforce the value of some kinds of knowledge over others (Larivière et al., 2016).

Within large teams, negotiations with respect to coauthorship have important ethical dimensions. Authorship problems may have a severe impact on the integrity of the research process (Marušić et al., 2011), particularly when authorship is used primarily as a tool of power (Youtie & Bozeman, 2014). The system of scientific authorship is built on trust that the published work reflects the data and analysis of the authors (Lagnado, 2003). Having an explicit discussion about coauthorship can make it less likely that people report collaborations as poor; large numbers of coauthors make the risk greater that people will have a poor experience (Youtie & Bozeman, 2014). Learning to follow clear guidelines for "contributorship" may be beneficial for providing a basis for negotiations about authorship (Rennie et al., 2000). One emerging practice that addresses a number of ethical issues related to authorship and contributions to a project is to list all the contributors to a study alongside the contributions they made (see, e.g., Bosman et al., 2017).

The learning experiences listed in Domains 2 and 3 regarding theoretical and methodological pluralism are central to this capability as well.

Learning Domains

Digital Technologies Supporting Transformative Research



Learning Domain 5: Digital Technologies Supporting Transformative Research

Digital technologies and their integration into new and ongoing practices influence how systems change is enacted, interpreted, and experienced. The affordances of new tools for gathering, visualizing, and using data can contribute to foundational understandings of learning (e.g., Rosé & Dimitriadis, 2021), as well as provide novel insights into systems change (e.g., Maroulis et al., 2010). While new technologies can expand what we are able to study and how we understand action and participation, and can offer new perspectives on vexing educational problems, it is crucial to remember that technologies can embed biases and unintended consequences into practice that cause harm (Benjamin, 2019a, 2019b; Noble, 2018). Pickering (2013, p. 7) reminds us that much of our understanding of the environment around us is “built on the engagement with the socio-technical world.” And yet, Culkin cautions us that “We shape our tools and thereafter they shape us” (1967, p. 70) Next-generation transformative research will require scholars to remain ethically vigilant and reflective by recognizing and promoting change that conforms with local beliefs and values and shapes technology in ways that are ethical and context-aware.

Developments related to the integration of new forms of data production, new ways to see patterns in data, and new techniques to store and keep track of data into transformative research programs offer important guidance for transformative research, as well as cases to illustrate both the risks and potential benefits of using new technologies (e.g., LeMahieu & Cobb, 2025). What makes these applications particularly salient is their integration of emerging capabilities of digital technologies with everyday practices, activities, and routines of individuals and groups to understand how social structures, tools, and individual agency interact and might be enhanced. These technological and social science trends could be important forces to spur transformative research forward and to keep the voices and empowering of people on the frontlines in view. Also key is that each of these applications include systematic ways to ensure that technology-enabled practice supports local contexts and aspirations.

Last, we understand that technology is not neutral. Every designed implementation of technology in practice is a tradeoff. In 1998, media and culture critic Neil Postman famously said, “Technology giveth and technology taketh away.” In preparing scholars for transformative research, we need to help them to recognize how to consider the various sways that technology embeds power relations; and to understand how local aspirations can be fulfilled through collaborative work.

Learning Domain 5: Digital Technologies Supporting Transformative Research

Digital technology assists educational researchers and practitioners in asking questions and taking up improvement initiatives that have been difficult or impossible to undertake in the past. For example, advances in computational linguistics are enabling investigations of much bigger corpuses of qualitative data from video and interviews (Sun et al., 2019). Current and emerging technologies will offer new opportunities for data gathering, data management analysis, and visualization—provided that the uses of these digital technologies are disciplined explicitly by practice-centered perspectives that emphasize organizing the use of tools in ways that are informed by theory, integrated within sound methodology, and inclusive of people who will use and be impacted by decisions related to technology. Being disciplined by theory is especially important because of the ease with which data can be captured and the sheer volume of data generated within many systems today. Tool use also needs to be disciplined by careful attention to matters of ethics and governance with respect to data control, ownership and sovereignty, sustainability, fairness, participatory democracy, and privacy and surveillance. We organize these technology-enabled opportunities by focusing on how technology can support data generation, data curation and management, and data analysis and visualization.

Data generation.

New data generation technologies have profoundly transformed various fields (e.g., medicine) and services (finance) by enabling unprecedented levels of insight, personalization, efficiency, and innovation. Tools, here, are technologies and techniques that digitally capture, represent and augment the physical world. Within transformative research, educational researchers have begun to use such tools to serve the larger goal of improving systemic change efforts. For example, learning scientists have used rich longitudinal records of users' interactions from digital learning environments to produce and automate analyses of some aspects of learner interactions like identifying learner challenges. These data can be used in providing guidance to teams seeking to improve learning in systems (e.g., Krumm et al., 2018; Wise et al., 2021; Yan et al., 2022). Policy researchers have incorporated agent-based simulations to generate data from “what if” scenarios to explore potential consequences of policies relating to school assignments (Maroulis et al., 2010). And improvement-oriented researchers have developed and tested data visualization systems to support improvements at the scale of a school district to the quality of instruction (Ahn et al., 2021).

At the same time, new data generation technologies highlight vast unresolved challenges related to data ownership and privacy within education. These challenges demand legal, ethical, and technical solutions to balance the interests of individuals, organizations, and societies. Ownership and privacy frameworks prioritizing transparency, consent, equity, and local contexts are essential for responsible use and innovation (Office of Educational Technology, 2024). For example, consider the problem of consent in connection with ever-present cell phones that collect location data even when not in use. Those engaged in efforts to improve educational systems can easily imagine important teaching and learning uses for such data.

Learning Domain 5: Digital Technologies Supporting Transformative Research

However, characterizing the ethical and governance dimension of use requires a new skill set beyond one-size-fits-all data policies. It requires a framework that respects the diversity of communities and productively employs such data for improvement.

Data curation and management.

New forms of data curation and management are another key enabler of transformative research. There are now tools that allow for the curation of datasets and metadata to enable the sharing of data in forms that maintain both privacy and transparency in research (van der See & Reich, 2018). Federal investments in large-scale, longitudinal databases have enabled state education agencies to develop and use “early warning indicator” systems intended to help reduce student dropout (Conaway et al., 2015). Researchers have used a broader set of indicators of equity, too, to create profiles of access, opportunity, and outcomes for schools in large districts (Bowers et al., 2022a). Researchers have also used statistical and psychometric methods to combine data from state federal systems, allowing them to compare scores and build national-level insights, such as those found in the Stanford Education Data Archive (see Fahle et al., 2024). These databases support new analyses that explore how educational resources and opportunities might help explain achievement differences. The growing fields of data science and learning analytics have developed additional ways to curate and analyze large scale data in service of improvement (Agasisti & Bowers, 2017; Bowers, 2025; Bowers et al., 2019; Piety, 2019; Piety et al., 2014; Singer, 2019).

Data analysis and visualization.

Data gathering and management sets the stage for analysis, but most importantly, for description of contexts and behavior. Several emerging technologies and tools are designed for innovative data representation, enhancing how data is visualized and understood. They also portend broader participation in data use and sensemaking. Such tools democratize data exploration and analysis, enabling individuals without coding or statistical expertise to engage meaningfully with data. These tools significantly enhance accessibility to descriptive data analysis for non-technical users by providing, among other things, user-friendly interfaces and powerful visualization capabilities (Bowers, 2021a; Bowers & Krumm, 2021; Bowers et al., 2022b; Fitzgerald & Tipton, 2024; Franconeri et al., 2021; Shao et al., 2024).

Customized visualization tools have been used recently to serve systems-wide improvement efforts in specific subject areas like mathematics. For example, Jackson et al. (2025) describe the development of tools for visualizing student experience data from classrooms, alongside routines for their use, that led to improvements in the quality of instruction in partner districts. Efforts like these build on a long history of exploratory data analysis traditions in social science research aimed toward transformational outcomes, including pioneering visualizations created by W.E.B. Du Bois (Du Bois & Eaton, 1899; Battle-Baptiste & Rusert, 2018). These recent efforts and others like them (see Hinnant-Crawford, 2020; LeMahieu & Cobb, 2025) integrate novel measurement forms, data collection, and visualization tools into transformative research. They are modern instantiations of data science in education that use exploratory data analysis and visualization to enable iterative bottom-up inquiry that hews closely to nuanced and rigorous description rather than confirmatory data analysis that occludes the richness of the setting in early analyses.

Learning Domain 5: Digital Technologies Supporting Transformative Research

Capabilities Needed for Using Digital Technologies

While development of digital technologies requires expertise that specialists would bring to a transformative effort, there are nevertheless capabilities entailed in understanding the potential benefits and dangers of technology that are crucial for all researchers to contribute knowledgeably and ethically to decisions about use. These capabilities include (1) becoming knowledgeable about ethical issues with digital technologies being considered, used, or studied in a program of research, (2) engaging partners in theory-informed design, curation, and visualization, (3) becoming knowledgeable about frameworks and tools for ethical data management and curation, and (4) accessing and learning from large datasets.

Becoming knowledgeable about ethical issues with digital technologies being considered, used, or studied in a program of research.

The exponential growth of digital tools, especially those powered by generative AI, is challenging our ability to know their general implications for education and research in the social sciences. However, researchers can take responsibility for understanding the dangers alongside the affordances of the tools they are considering, using, or studying. By focusing on specific contexts of use and purposes, and the specific sets of tools that have served those purposes, one can learn about key risks and ways in which they might be mitigated in deciding whether and how to use a tool, much as we would do with any other new technical tools. To that end, special issues or collections in field-specific journals can help. For a few disparate examples see the special issues on generative AI and education in *Studies in Technology Enhanced Learning* (in press) and in *Learning, Media & Technology* (2020), the 2019 thematic collection on automation of systematic reviews in the *Systematic Reviews* journal,

and the special section on AI in educational statistics in the *Journal of Educational and Behavioral Statistics* with articles on standards in measurement by Ho (2024) and Dixon-Román (2024) among others. More broadly, these and other resources can facilitate becoming familiar with general categories of risks in generative AI and their implications for specific contexts and uses. For example, recent handbooks focused on ethics (e.g., *Oxford Handbook of Generative AI and Ethics*, 2020; *Generative Artificial AI and Ethics: Standards, Guidelines and Best Practices*, 2025) or journals (e.g., *Critical AI*) and actively maintained websites (e.g., *AIEthicist.org*) can be helpful in this regard. Of course, one can and should seek out colleagues with relevant expertise as a resource for learning. Among the categories of dangers frequently identified are bias in algorithms used to classify or make predictions; amplification of biases, stereotypes or misinformation; violations of data privacy and intellectual property rights; insufficient transparency and explainability; and overreliance on technical solutions without understanding their limitations. These risks manifest differently in different contexts and when used for different purposes. They have been shown to be significantly misleading and harmful to historically marginalized groups (Benjamin, 2019a,b; Costanza-Chock, 2020; D'Ignazio & Klein, 2023; Dixon-Román, 2016; Dixon-Román et al, 2020; Noble, 2018). Particularly relevant to transformative research is becoming knowledgeable about technology tools intended to support systems-level coordination, such as student information systems and large-scale testing. Any research program considering, using, or studying digital technology should seek to understand the ethical issues involved. Beneficial learning experiences might include the following:

- For uses of digital technology under consideration in any research program, work with research partners and colleagues with expertise in digital technologies to identify relevant risks and research that explored them, and to consider ethical principles that might guide their use.

Learning Domain 5: Digital Technologies Supporting Transformative Research

Engaging partners in theory-informed design, curation, and visualization.

Consistent with Domain 1: Community Engagement, practices related to digital technology require engaging people who will use and be impacted by new uses of technology. Education researchers have developed a number of approaches to codesign of digital learning environments (see DiSalvo et al., 2017; Gomez et al., 2018, for reviews). Similarly, the emerging fields of collaborative learning analytics (Krumm et al., 2018; Wise et al., 2021) and improvement science in education (LeMahieu & Cobb, 2025) have developed strategies for engaging collaborating partners in curating and using large datasets. Relatedly, theory should guide decisions about data generation, curation, and visualization. Being disciplined by theory is not straightforward, because of the sheer volume of data generated within many systems today. There may well be a need for multiple theories, for example, a theory of instruction that is coupled with theories of data use and visualization design (e.g., Jackson et al., 2025). Programs of transformative research will have to discover how datasets can best be curated in ways that support researchers and practitioners as they seek to improve learning and teaching and to examine inequities at the systems level (Bowers & Choi, 2023), consistent with Domain 2: Theoretical Pluralism. Finally, scholars have also used participatory design strategies for developing visualization systems that are usable by partners and that highlight matters pertaining to equity (Ahn et al., 2021; Bowers, 2021a).

Experiences that may be beneficial for engaging partners in theory-informed design, curation, and visualization include opportunities to:

- Engage in a comparative analysis of different approaches to codesign for different applications, from digital learning environments to learning analytics systems to sociotechnical systems for curating and using data.
- Apprentice to a codesign project involving use of digital technologies where researchers, educators, and communities have come together to pose new questions and to surface challenges and successes in their education systems to index equity in new data systems as they are developed and deployed (Bowers et al., 2024).
- Consider the theories of learning and teaching, of organizing, and of power that underlie technology use (Selwyn, 2023).

Learning Domain 5: Digital Technologies Supporting Transformative Research

Becoming knowledgeable about frameworks and tools for ethical data management and curation.

There are a number of frameworks, principles and tools that are now available to support responsible data management and curation that are relevant to transformative work. Examples include the FAIR Guiding Principles for scientific data management and stewardship (Wilkinson et al., 2016) and the CARE Principles for Indigenous Data Governance (Carroll et al., 2020). The FAIR principles, promoted by the international GO FAIR Initiative, were intended “to provide guidelines to improve the Findability, Accessibility, Interoperability, and Reuse of digital assets” consistent with the open science movement. The CARE Principles—Collective benefit, Authority to control, Responsibility, and Ethics—provide an important complement to FAIR (Carroll et al., 2020). As the CARE authors at the Global Indigenous Data Alliance note:

The current movement toward open data and open science does not fully engage with Indigenous Peoples rights and interests. Existing principles within the open data movement (e.g. FAIR: findable, accessible, interoperable, reusable) primarily focus on characteristics of data that will facilitate increased data sharing among entities while ignoring power differentials and historical contexts. ... The CARE Principles for Indigenous Data Governance are people and purpose-oriented, reflecting the crucial role of data in advancing Indigenous innovation and self-determination. These principles complement the existing FAIR principles encouraging open and other data movements to consider both people and purpose in their advocacy and pursuits. (GIDAGlobal, “CARE Principles”)

The aspiration for initiatives like these is to significantly enhance the ability of educators, researchers, and policymakers to address exploitation and to improve outcomes through equitable and responsible curation practices. To enact these principles, scholars should consider how to develop and curate interoperable open-access datasets that follow robust data management frameworks (Bowers & Choi, 2023; Thielen & Hess, 2017; Lewis, 2024) while also honoring their responsibility to respect the authority of those who provided the data and to seek mutual benefit (Carroll et al., 2020).

Experiences that may be beneficial for becoming knowledgeable about frameworks and tools for data management and curation include opportunities to:

- Use principles like FAIR and CARE in evaluating the ethics of technology use
- Attend workshops and conferences on emerging technologies and fields, such as data science, learning analytics, artificial intelligence, machine learning, and natural language processing
- Read technology blogs and industry reports to stay informed about the latest advancements, research findings, and best practices in design and uses of digital technology

Learning Domain 5:

Digital Technologies Supporting Transformative Research

Accessing and learning from large datasets.

Today, there are a number of large datasets available through organization and agencies like the Open Science Foundation, the Inter-university Consortium for Political and Social Research (ICPSR), Stanford Education Data Archive (SEDA), LearnSphere (Koedinger et al., 2017), the Item Response Warehouse (Domingue et al., 2023) and—for states at least—longitudinal databases that can be used to better understand patterns of educational inequity and identify leverage points for addressing them. Familiarity with the particular kinds of indicators for which data might be curated is important, as well as what questions can and cannot be answered by particular datasets. Such datasets can also contextualize particular programs of research, explore research questions across programs and contexts, and support practice with approaches to analysis. Recent reports from the National Academies of Science, Engineering, and Medicine (NASEM) identified equity indicators for school districts that call for moving beyond a focus on school outcome data to include student experience data and the causal mechanisms through which student outcomes are enabled and constrained. This move to a focus on student experience and causal mechanisms, has been a focus of several improvement research efforts (NASEM, 2019, 2020). The growing field of data science, a field with deep roots (Donoho, 2017), supports many analytic tools in education (Agasisti & Bowers, 2017; Bowers, in press; Bowers et al., 2019; Piety, 2019; Piety et al., 2014; Singer, 2019).

Experiences that may be useful for developing familiarity with and practicing use of these datasets include opportunities to:

- Participate in a workshop to learn about an existing source of data (e.g., ICPSR) and protocols for accessing it
- Apprentice within a project using a large-scale dataset pursuing questions related to educational equity
- Design a system of complementary measures that relies on a mix of administrative and researcher-created measures, to address limitations in administrative datasets

Learning Domains

Knowledge Mobilization



Learning Domain 6: Knowledge Mobilization

Mobilizing knowledge for policy and practice refers to the flow and uptake of ideas, tools, and findings from research by other researchers, brokers and intermediaries, users of research in systems, and multiple publics. The aim of knowledge mobilization is to enhance the potential for research to benefit the public and positively impact systems (Social Sciences and Humanities Research Council, 2021). Knowledge mobilization is not something that is limited to dissemination: it occurs throughout the research process and is relevant to decisions about what questions to pursue, what methods to use, and how and when to engage knowledge brokers, participants, and users of research in the process (Farley-Ripple & Grajeda, 2019; Lockton et al., 2022). In the past decade, knowledge mobilization has also involved communication of research in new forms of media, such as podcasts, blogs, and microblogs).

A key aspect of knowledge mobilization is research use. Research use encompasses how educators, community members, educational leaders, or policy makers draw on research deliberately or otherwise, to inform or justify their decisions (Coburn et al., 2009; Finnigan & Daly, 2014; Oliver et al., 2014), thinking (Altman et al., under review; Cain, 2015; Farrell & Coburn, 2018), work practices (Bohannon et al., 2024; Honig et al., 2017), and/or visions for possible futures (Bang & Vossoughi, 2016). In this view, research is not necessarily produced external to communities and schools, although it sometimes is. It can also be developed via processes internal to schools and communities or via coproduction.

Policies often explicitly encourage using research to inform decisions, such as what curriculum or programs to adopt, a form of research use referred to as instrumental use (Weiss & Bucuvalas, 1980). Other uses of research involve engaging with general ideas, concepts, or generalizations of research that shift how users think about a problem or a solution (conceptual use, Altman et al., under review; Weiss & Bucuvalas, 1980), justifying decisions (political or symbolic use, Asen, 2013; Asen & Gent, 2018), using research because it is required to secure resources (imposed use, Weiss et al., 2005), and engaging with tools where research is embedded in ways intended to guide ongoing work practices (latent use, Bohannon et al., 2024). Finally, research can be used in what is known as process use, which is when participants contribute directly to aspects of the research itself, such as helping to formulate questions or making sense of data (Nutley et al., 2007).

Knowledge mobilization also includes engagement with different publics—locally, nationally, internationally, and online. Such engagement is referred to as “public engagement,” “public scholarship,” or “engaged scholarship.” It can take many different forms, such as participating in public events to create opportunities for public dialogue about research ideas and findings; involving members of the public as coinvestigators (i.e., community science), and engaging with new forms of media (Besley et al., 2016; Burchell, 2015). Contemporary models of public engagement and communication emphasize the need for two-way dialogue rather than one-way approaches (Davies, 2008).

Knowledge mobilization is also an area of scholarship that is focused on empirical studies of how people engage with research, as well as on strategies for fostering more and better use of research evidence, with interdisciplinary communities and journals such as *Evidence and Policy* that span the social and health sciences. Recent scholarship in the field has focused specifically on the need to attend to matters of power and equity in terms of what knowledge is mobilized, for what purposes, and with or for what communities (Doucet, 2021; Finnigan, 2021, 2023; Kirkland, 2019).

Learning Domain 6: Knowledge Mobilization

Why is Knowledge Mobilization Important for Transformative Research?

Understanding of knowledge mobilization is important because transformative research seeks to be relevant for and have an impact on policy and practice. In this respect, the evidence base suggests some ways that traditional dissemination efforts fall short. In addition, policy guidance promotes the instrumental use of research to select effective programs and policies, but this is only one potential form of research use. In fact, educational leaders are less likely to use results of experimental studies to select programs than to use research that can inform everyday decisions they make related to the design of professional development and implementation of programs (Farrell et al., 2022; Finnigan & Daly, 2014). Understanding when, where, and how decisions are made about key systems components, resources, and incentives for change is critical to establishing pathways for knowledge mobilization.

Being able to engage different publics also has the potential to influence the course of efforts to enact systemic change. At present, think tanks and advocacy groups play a strong role in shaping policy agendas and influencing discourse (Scott et al., 2009; Scott & Jabbar, 2014). But teams engaged in transformative research could play a role in helping shape public discourses in education by, for example, presenting visions for education or proposing different kinds of frames for understanding persistent problems (Eng, 2016). In addition, some social media platforms afford opportunities for two-way interaction that promotes engagement between researchers and practitioners (Rosenberg et al., 2020). Importantly, impact is more likely when groups engage as collectives, drawing on networks that are tied to decision makers in policy and practice, supporting the ways in which research is reflected in policy, and challenging misrepresentations.

Capabilities Needed for Knowledge Mobilization

Given that transformative research aims at impact, it is important for programs that prepare researchers for transformative research to offer opportunities to learn 1) how to develop facility with multiple forms of two-way communication with different publics, 2) how research can and does influence policy and practice, 3) how to support groups' sensemaking activities with evidence, and 4) how power dynamics can undermine collaborative research and harm communities and how the harms might be acknowledged and mitigated in research.

Developing facility with different forms of two-way communication.

There are several different strategies for engaging in two-way communication with different publics, a number of which overlap with capabilities for engaging with communities. For example, participatory research methods and “co-production” of research evidence are often emphasized as important strategies for public engagement (Chilvers & Kearnes, 2015). Others pertain to engaging with particular audiences (e.g., school boards, parent groups), communication with traditional media, or use of social media (Burchell, 2015). Researchers can also engage with different aspects of research governance locally at their own institutions, as well as in public institutions and with private foundations (Fransman, 2018). All these strategies are avenues toward establishing policies, incentives, and infrastructures for transformative research. Some scholars—both individually and collectively—may be effective as “policy entrepreneurs,” that is, actors who seize moments of challenge and opportunity to advocate for major changes to policies (Mintrom & Norman, 2009). A good example in education are scholars who supported the development of and advocacy for the Next Generation Science Standards (Hardy & Campbell, 2020).

Learning Domain 6: Knowledge Mobilization

Some experiences that can support developing capacity for engaging in two-way communication with publics include opportunities to:

- Coproduce resources (e.g., teaching tools, suggested routines) for the transformation of practice (Bell & Rhinehart, 2021).
- Practice communication in different media (Burchell, 2015).

Learning about how research can influence policy and practice.

Understanding and recognizing the qualities of research that make it more likely to be taken up in policy and practice is an important capability for knowledge mobilization in transformative research. We know that research is more likely to be useful and usable when it addresses questions and issues that educators are grappling with (Farrell et al., 2019; Penuel et al., 2018; Schneider, 2014), at the time that they are grappling with them (Akkerman et al., 2021), in a form that communicates clearly (Davies et al., 2000) and helps them contextualize and problem solve, and when accompanied by opportunities for sensemaking (Farrell et al., 2019).

Researchers who seek to do transformative research would benefit from having a greater understanding of the multiple, interactive pathways by which research can influence practice and policy. One of those pathways is through decision-making that happens within systems. Decision-making is not a single event. Rather, decision-making in schools and school districts is distributed, iterative, and unfolds over time in a range of formal and informal settings (Coburn et al., 2009; Farrell et al., 2019; Honig et al., 2014; Weiss, 1980). By understanding more about the work practices and decision-making processes of a range of actors, researchers can begin to understand when and how research can become a part of those work practices. Another major pathway is through social relationships and networks; peers tend to turn to each other and others they already know for research (Daly et al., 2014; DeBray et al., 2014; Finnigan & Daly, 2012, 2014; Hopkins et al., 2019; Neal et al., 2015; Penuel et al., 2017), as well as to researchers they know through participation in research-practice partnerships (Finnigan, 2023; Penuel et al., 2020).

Some experiences that can support learning about how research can influence policy and practice include opportunities to:

- Join projects and partnerships where people are engaged in coproduction of knowledge for policy and practice (Weddle et al., 2024a,b).
- Review the research about the ideas, programs, and practices that have taken hold in diverse educational contexts (Schneider, 2014).
- Study scholarship on deliberation among policy makers for how research is taken up (e.g., Asen et al., 2011).
- Work with collaborators to understand key decision-making processes related to a focal practice, policy, or program and the people that are involved in it.

Learning Domain 6: Knowledge Mobilization

Learning to support sensemaking with evidence.

Yet another capability involves supporting groups' sensemaking with evidence, including groups that include school and community members. Research use is an interactive process that involves complex sensemaking, persuasion, and deliberation. Some actors—whether researchers, community members, or educators—may seek to guide the sensemaking process or to influence what decision makers make of it (Gioia & Chittipeddi, 1991). These processes can be facilitated and structured to support reflection on system actors' theories of change (Cobb et al., 2013), to broaden classroom participation (Reinholz et al., 2024), to support repair in school–community relations impacted by racism (Marshall, 2024), and to guide iterative design, testing, and transformation of systems (Bang & Vossoughi, 2016; Daly & Finnigan, 2016; Santo, 2018; Zavala, 2016), among other uses within transformative research. Those processes need to be designed in ways that are attentive to the organizational conditions for sensemaking, which influence how people interpret research and their ability to use it (Coburn et al., 2020; Farrell et al., 2019; Finnigan & Daly, 2014). Purposeful sensemaking for research benefits from adopting a “learning perspective,” and designing those activities with the idea that to take up ideas from research requires individual and organizational learning (Farrell et al., 2022).

Experiences that can help develop skill in facilitating sensemaking include opportunities to:

- Communicate about findings, transformational designs, and evidence-based practices to a range of audiences and in a range of modalities (Bell & Rhinehart, 2021).
- Engage in joint sensemaking about the research process, findings, and transformational design with practice partners (Cobb et al., 2013; Roderick & Easton, 2007).

Learning about power and uses of research that have caused harms.

Researchers also need to develop an understanding of how power, authority, and status operate in research. For one, powerful brokers of research, such as policy advocates, may argue for particular interpretations and uses of research, reflecting partisan views about how best to reform or improve systems (Reckhow et al., 2021; Scott & Jabbar, 2014; Scott et al., 2014). Often, evidence is used to justify existing inequities, rather than challenge them (Doucet, 2019; Kirkland, 2019). Further, there is a long history of research that is taken up in policy and practice that takes a deficit view of children, families, and communities that—even when it purports to aim toward justice—in fact reinforces those deficit views (McDermott & Vossoughi, 2020).

Even in partnerships where the roles are intended to be more egalitarian, power can come into play (Finnigan, 2023). Power differences sometimes quash perspectives of racially minoritized members of the partnership (Tanksley & Estrada, 2022) or other less powerful actors within the partnership (Denner et al., 2019). Creating conditions for effective research use within unequal systems requires the development of politicized trust. This means developing an understanding of how power and inequality shape interactions in partnerships and the solidarities that need to be established to engage in work together across communities and groups where there are power differences and historically grounded mistrust (Vakil et al., 2016).

Learning Domain 6: Knowledge Mobilization

Relatedly, it is important that researchers learn about the pernicious effects of research on communities.

There's a long and shameful history of research use that stretches from exploitation of minoritized communities (Kirkland, 2019; Saini, 2019), through research that takes from communities without giving back to them (Bang et al., 2016; Chicago Beyond, 2019), to research that propagates damage-centered (Tuck, 2009) or deficit views (Brown et al., 2019; Leonard, 2016; Vossoughi et al., 2023). Understanding this history is crucial for transformative research, so that researchers can work to ensure that their own efforts—no matter how well-meaning—do not contribute to reproducing inequality and reinforcing structures of oppression (Lee, 2009).

Experiences that can help develop understanding of power and harms of research include opportunities to:

- Read about case studies of sites where research has caused harm
- Engage with the stories of communities that have been subjects of research that has not been beneficial to them (Chicago Beyond, 2019)

While, for the purpose of this report, we have presented these six learning domains in separate sections, it is crucial to understand them as interrelating aspects of the practice of transformative research. Any act of transformative research or relevant learning opportunity will always entail, at least implicitly, elements of other domains. Further, as researchers continue learning across their careers, they will weave together threads from multiple domains into their evolving professional identities. And so the next question is: How might the organizations and institutions that provide the infrastructure for research preparation and practice support learning across these domains?

Infrastructure to Support Preparation for Transformative Research

Infrastructure to Support Preparation for Transformative Research

We see the capabilities we have proposed for preparation for transformative research as valuable for graduate students and early career scholars as well as for experienced scholars seeking to engage in more transformative programs of research. Fostering these capabilities may well require rethinking courses, programs of study, apprenticeships, and norms of practice as well as incentives and resources for faculty and professionals. This entails shifts in the infrastructures that support both research and preparation for research.

By infrastructure, we mean all of the components—tools and technologies, principles and standards, roles and relationships, organizational routines, and systems—that don't have to be recreated every time a new learning opportunity or research program is undertaken (cf. Slota & Bowker, 2017). Infrastructures are never neutral; they reflect values, they enable certain kinds of practices and relationships and constrain others, and they can shape how we view the world (Slota & Bowker, 2017). In our introduction, we spoke to some of the ways that the existing infrastructures in the academy may be inconsistent with the goals of transformative research. Supporting the work of transformative research requires illuminating and reconsidering the infrastructural components on which we have come to rely. This work of infrastructuring involves iterative, collective design-work that incrementally reshapes the infrastructure over time (Karasti, 2014; Karasti & Syrjänen, 2004; Le Dantec & DiSalvo, 2013).

Below we offer recommendations for infrastructural components that might best support preparation for and participation in transformative research as oriented by the previous chapters. We have categorized infrastructural components in terms of the organizational structures in which they are primarily located:

- Collaborative research infrastructure
- Program infrastructure
- College/school or university infrastructure
- Inter-institutional infrastructure

An important consideration is how many of the infrastructural components that currently operate primarily within programs, colleges, and universities might be coordinated to give researchers access to a broader range of learning opportunities and interpersonal connections.

Collaborative Research Infrastructure

Given the focus on community engagement, we begin with relational infrastructures that reflect sustained partnerships between local communities, schools, districts, or other educational agencies/organizations and universities, colleges, or other research organizations partnering with them.

Institutionalized Relationships with Mutual Benefit

Long-term institutionalized relationships between universities and local educational organizations, agencies, and communities can support sustained programs of transformative research over time. As we noted in our introduction, our field has a history of research primarily benefiting individual researchers and universities, with little attention to whether and how research is benefiting communities, families, and young people. Attention to mutual benefit entails learning about one another's ways of life and collaborating, aspirations and goals, and institutional incentives and constraints. It also entails exposing and remaining vigilant about the power differentials between institution types as critical dimensions in establishing mutual benefits. This kind of relationship building lays the groundwork for codesigning programs of research that serve each partner's goals and needs.

Indeed, some institutions are developing ways of building such long-term relationships. Such research-practice, research-practice-policy, and community-engaged partnerships tend to be supported, in part, by core institutional funds and involve multiple researchers and at times, multiple partnerships. They provide opportunities for novice and experienced researchers to engage in a range of research practices that are likely to foster impact. Such institutionalized partnerships exist at such institutions as Northwestern University (Office of Community Education Partnerships), University of Michigan (Detroit P-20 Partnership), University of Chicago (UChicago Consortium on School Research), UC Santa Cruz (Educational Partnership Center), and University of Washington (Unite:Ed).

Collaborative Research Infrastructure

Curriculum for Community Entry

Early career scholars would benefit from structured learning opportunities to enter communities ethically and in a spirit of humility and partnership. Established relationships, like those described above, can also help ensure that graduate students and early career scholars have access to participatory learning opportunities. Within a given partnership, newcomers might be supported by community and university mentors to guide them in learning about local community life experiences, aspirations, and perspectives and about how they might establish their own relationships with community partners. Mentors might also support them in learning how to engage collaboratively in partnerships where decisions about what to research and how to research are shared among community and university research partners. For instance, the Strategic Data Project at Harvard's Center for Education Policy Research embeds and mentors research fellows in partner districts and other educational organizations and agencies.

Archives of Shared Data for Use by Research Partners

Here we speak to two types of archives: those that are locally curated and available only to research partners under agreements that respect privacy, safety, and data sovereignty and those that span multiple contexts and are either publicly available or available to researchers who agree to abide by specified ethical principles.

Locally curated data archives, accompanied by structured opportunities to learn how to use them ethically, can support research partners in addressing a variety of questions from different theoretical and methodological perspectives and tracing progress over time. These refer to archives that are locally maintained and governed by carefully negotiated data agreements among partners (e.g., the Youth Data Archive at the John W. Gardner Center at Stanford; McLaughlin & O'Brien-Strain, 2008). Learning to work with local data archives can help newcomers develop technical skills and ethical sensibilities necessary for responsible data sharing, as well as show them the value of transparency in data collection and analysis. A management, communication, and reporting infrastructure is necessary to provide support to all partners and ensure ethical practices around data management and visualization, as well as around presentations and publications. Such archives need data agreements that respect privacy, safety, and data sovereignty.

Collaborative Research Infrastructure

Local data archives are distinct from those from those maintained centrally that are widely available. It can also be useful to have access to data from such open archives, which typically include data from multiple contexts, to situate particular programs of research, to explore research questions across programs and contexts, and to practice approaches to analysis. Examples of sources for data that are either publicly available or available to researchers who agree to ethical terms of use include: the Educational Opportunity Project at Stanford which provides access to data from hundreds of millions of state test scores and NAEP scores over 15 years, the Inter-University Consortium for Political and Social Research (ICPSR) archive of mostly quantitative data, and the Qualitative Data Repository at Syracuse University. Local data archives and centrally managed data archives ought to be connected by data standards that enhance their collaborative use, as we note in Domain 5.

Established Relationships with Policymakers

Advocating for change involves building relationships with policy makers who are in a position to support the effort. Universities and their partners might create or institutionalize a unit or center that builds and maintains bridges to policymakers. Such a unit or center could, for example, have infrastructure enabling ongoing engagement with state or federal policymakers by convening legislators and legislative aides in information sessions to profile recent policy relevant findings and create and disseminate policy briefs. Having a staff person who participates in policy discussions in education in an ongoing way, who maintains relationships with legislators and their staff and can serve as a conduit for university researchers, their findings, and their programs, supports ongoing conversation with policy makers. Gathering spaces (virtual and physical) can be enhanced by networking them together within and across professional associations and universities. The Policy Analysis for California Education (PACE) research center illustrates one way to bring policy and research into regular contact to inform decision making. Where meaningful, relevant policy makers might also participate as active research partners. For instance, there are partnerships with state-level leaders involving the kind of codesign described in Domain 1 (e.g., Weddle et al., 2024a,b).

Program Infrastructure

In this section, we focus on infrastructural components in universities at the program, college, or school level that facilitate learning and teaching the capabilities outlined in our framework.

Expanded Applicant Pools and Criteria for Admissions

Transformative research benefits from participants with a broad range of backgrounds, experiences, and interests, including from researchers who have lived or worked in communities or organizations like those with whom they will partner. Broadening the pool of applicants to graduate and PhD programs is one crucial approach for enhancing diversity in the field.

One strategy to broaden the range of people who become education professionals is to diversify the cohorts of students who apply to graduate programs. This might include providing opportunities for undergraduates to learn about and participate in education research projects and encouraging applications from school and local community research partners who might be interested in professional research preparation.

Making sure evidence sought and used in graduate admissions decisions signals what the program values may also encourage a broader range of students to apply and their recommenders to highlight relevant capabilities. Valued evidence could include experiences like community organizing and development, participatory leadership and governance in civic institutions, and partnerships with youth and their communities.

Mentoring conversations with admitted students can help them make good decisions about whether this is the right program for them. These would include developing a meaningful understanding of the prospective student's goals, background, interests, and commitments, sharing more about the nature of the program and the kinds of opportunities for developing deep expertise and community engagement the program provides, and supporting the prospective student to think through questions of fit.

Program Infrastructure

Coherent⁶ Programs of Study

Well-scaffolded, integrative programs of study enable students to learn capabilities related to each of the domains in our framework, develop deep expertise consistent with the professional identities to which they aspire, and support them in preparing to continue learning after their initial program of study is complete. Programs of study can encompass apprenticeships in community-engaged projects, courses, guided and self-directed reading, short-term workshops, and engaged mentoring. While there are multiple ways to accomplish this, students should have access and support for coherent learning trajectories. In the previous section on the Domains, we illustrated capability-specific learning opportunities; here we focus on infrastructural components that support integration across the capabilities outlined in the framework.

Courses that engage students in integrating theoretical and methodological approaches to address issues relevant to transformative research provide crucial learning opportunities. Among the most valuable courses are those that center on substantive issues and goals—whether those of a specific partnership or those impacting many educational systems and communities, like educating for civic discourse and reasoning (Lee et al., 2021). Where possible, cotaught courses, with faculty who engage in dialogue from different perspectives, are particularly valuable.

Apprenticeships and related courses that prepare students to engage in and co-lead participatory research are crucial as well. In addition to supporting entry into specific community-engaged projects, coursework and other activities might help early career researchers gain an understanding of the history of relations among universities, communities, families, and schools, and of past endeavors to transform educational systems. Studying and critiquing examples of relevant projects can be particularly valuable in early learning opportunities.

Programs will need to make judicious choices about what advanced courses they can routinely offer consistent with faculty expertise and students' interests. Beyond that, short courses and extended workshops on specific topics that are not part of the regular curriculum and that are open to people at different stages of their careers may be designed to support preparation for transformative research and marketed beyond the school/college. Individual students with more distinctive interests might be supported through guided reading, access to learning opportunities elsewhere, and through brokered connections with faculty at other institutions.

Since all programs are limited in the learning opportunities they can themselves offer, it will be important to seek out information about and support for participating in learning opportunities elsewhere. Schools and colleges of education would benefit from maintaining inventories of relevant courses elsewhere at their university or at other universities with which they have reciprocal registration arrangements. Additionally, inventories of institutes, consortia, networks, or professional organizations offering methodological training or internships would be valuable to maintain (see below).

⁶ We use the term *coherent* here and below to indicate learning trajectories that fit with the goals of transformative research.

Program Infrastructure

Supportive Mentoring

Transformative research often entails scholars negotiating and renegotiating their identities, dispositions and mindsets as they encounter new relationships and experiences across their careers. For those aspiring to become transformative researchers, mentorship can provide the support, guidance, resources, and inspiration to navigate these complexities. Mentorship can also be key to novice researchers' coming to view sustained, systemic, and practical change as a foundational goal of education research, one that has not, in our experience, been as widely foregrounded as more conventional scholarly goals that benefit researchers and the institutions where they work.

Scholars learning to do transformative research bring a wealth of prior knowledge and experience to their educational pursuits, which can be leveraged in the mentoring process. A key issue in mentoring is supporting students and early career scholars in productively navigating synergies and tensions among (a) their own identities, histories, knowledge, and commitments, (b) the perspectives, practices, and values of the academic communities or disciplines they are joining, and (c) the perspectives, practices, and values of the communities with whom they are engaging in research. Differences and tensions that arise can become sites for learning.

Roles within transformative research are often fluid, and people may claim some of these roles as central to how they see themselves (Tabak, 2022). For example, for people engaged in transformative research, "researcher" may be one of many professional identities, alongside "community member," "practitioner," "designer" or "activist." An activist identity presents specific challenges of recognition when others view these identities as conflicting with being a scholar (Reiter, 2015). Within many partnerships, participants purposefully pursue pathways from activism into the academy while maintaining a place and identity as a community leader or activist (Ghiso et al., 2019). Students may also experience transformations in familial and communal relations that can be hard to navigate as their professional identities evolve. And the workings of power within the academy can make it harder for students to evolve identities coherent with their own experience, knowledge, and commitments. Scholars' experiences and dispositions influence their willingness to engage and persist through the fluidity of developing a transformative research identity. Mentors can more effectively support mentees' personal deliberation and professional growth by establishing a mentoring environment where they feel comfortable expressing their identities and exploring new ways of thinking, and where they feel valued for their professional work.

The mentor–mentee relationship is not necessarily a one-on-one arrangement. Access to mentors who have differing expertise and are open to the affordances and challenges of alternative perspectives will be important. This can occur in advising teams, where students can access multiple long-term mentors; rotating internships with faculty and community mentors; opportunities to participate in grant proposal development; and ongoing community-engaged projects. Mentor–mentee relationships also entail supporting students with particular interests in developing connections with mentors outside of formal academic programs and pointing them to programs outside the university that can provide such mentoring.

Program Infrastructure

Mentorship can also support learners by guiding them to become mentors themselves. This transition benefits the individuals involved and the larger community and organizational context. This role transition is important because mentees who become mentors will reinforce their learning by teaching others. Also, a cycle of mentee-into-mentor can foster retention in the field and pave the way for the next generation of scholars who are committed to and feel supported in engaging in transformative research in ways that honor their professional identities and commitments.

Coherent Program Culture and Informal Learning Opportunities

Crucial for both students and faculty is the opportunity to participate in a community where the capabilities described in our framework are routinely practiced, not just in formal programs of study, but in informal learning opportunities and interactions.

Informal opportunities for learning together can complement course work and apprenticeship in multiple ways. These include reading groups, brown bag talks, and routine opportunities for students, faculty, and research partners to share work in progress (such as small “design sprints” where faculty, students, or visiting partners present a design problem and then participants brainstorm solutions). These are great places to engage in informal discussions about issues like handling uncertainty and ambiguity when choosing and using different methodologies (Roulston, 2019) or exploring different approaches to protecting the rights of human participants in complex research projects, particularly those involving participants from systemically marginalized communities (de Castell & Jenson, 2010; Dhillon et al., 2023; Panos et al., 2021).

Small, intensive intellectual communities can provide sustained opportunities for engaging in interdisciplinary and multitheoretical discussion, embracing complementarities and challenges, and deepening knowledge. These are also great places to support students in developing strategies for reading and contrasting complex and challenging texts and engaging in respectful dialogue with scholars who have perspectives different from their own. Considering how to engage community and school partners in such endeavors, in places where they gather, and on topics of interest to scholars, practitioners, and community leaders alike enhances learning opportunities.

Providing guidance and routine opportunities for engaging in difficult conversations about controversial topics, including opportunities for post-conversation reflection and learning, is especially important in today's politicized environment. Many universities have programs that support such conversations (e.g., UCLA's Dialogue across Difference or the University of Michigan's Program on Intergroup Relations), and guidance can also be found from various networks and collaboratives (e.g., Facing History and Ourselves; National Equity Project, which addresses dialogue about codesigning for equity).

College/School or University Infrastructure

In this section we speak to the institutional incentives and resources that might encourage the development of teaching and learning infrastructures discussed above.

Credit for Community-Engaged Apprenticeships and Research

Shifting the balance of credit hour requirements in graduate programs so that students can earn more (perhaps even the majority) of their credits through apprenticeships within community-engaged research and research–practice partnerships would support preparation for transformative research. This shift would signal the importance of what can be—and perhaps has to be—learned through participation in collaborative research endeavors. It also invites a rethinking of how to support those apprenticeship programs with the kinds of engagement with ideas, papers, and discussions that are more typical in classrooms and that can help scholars make sense of what they are seeing and doing in their apprenticeships.

Specialized Certificates

Relevant areas of curriculum, in community engagement for instance, could be recognized through certificate programs that acknowledge coursework and research experiences in research–practice and community-engaged partnerships, such as the Graduate Certification in Community Engagement at Michigan State University.

Faculty Support for Co-Teaching and for Program and Course Redesign

Faculty need time, resources, and appropriate instructional credit for working together to rethink programs of study, developing or revising courses, coteaching (which is often more time-consuming than teaching alone), supervising apprenticeships, mentoring, and facilitating informal learning environments. This suggests rethinking the way faculty workloads are conceptualized and credited along with the economics of credit hour generation.

College/School or University Infrastructure

Coherent Criteria for Evaluation of Research and Teaching

A key challenge to advancing transformative research remains the limited incentives for scholars, especially early career scholars, to work this way. Academic reward systems principally favor publications (sometimes solo publications) and grants, often creating disincentives for engaging in the time-consuming work of building and maintaining partnerships and participating in research that addresses partners' concerns and goals. Changes to tenure and promotion guidelines to reward more public and engaged scholarship will be important. Recent reports from national academies and other organizations speak to this issue (Aurbach et al., 2023; NASEM, 2025; Ozer et al., 2023).

Additional incentives, such as providing more funding for the actual labor of cultivating and maintaining partnerships, could signal the importance of such work to faculty. Incentives might also include financial support for attendance and memberships in practice- and community-oriented spaces, such as practitioner-focused conferences. They can provide opportunities to copresent with practitioners and also develop practices for communicating effectively with practitioners and community members. Incentives might also include recognizing, elevating, and rewarding transformative work more explicitly—perhaps through the creation of incentives and recognition like annual awards and fellowships, or other indicators of prestige and institutional valuing.

Inter-Institutional Infrastructure

To the extent that universities and other institutions can network to complement one another's learning opportunities, the learning resources for transformative research across career stages will greatly expand. Such relationships facilitate exposure to different kinds of theoretical frameworks and methodologies and different approaches to and contexts for participatory research. They also facilitate networking among research participants. These can range from short-term opportunities like those available at professional conferences to extended workshops and shared courses. Professional organizations, multi-institutional collaboratives and networks, and national academies are well positioned to offer such learning opportunities and, with the help of funders, can seek ways to make them accessible to a broad population of learners. Below we offer examples of such collaboratives, consortia, and networks that support learning for transformative research.

University-Based Consortia and Other Reciprocal Arrangements

University alliances allow students to register for courses at any participating institution (e.g., Big Ten Academic Alliance). Expansion of these sorts of reciprocal arrangements would serve the field well. Many universities or university-based collaboratives offer summer workshops, some for certification and credit, where researchers can go to enhance their capabilities (e.g., the Inter-University Consortium for Political and Social Research [ICPSR] summer program in quantitative methods based at the University of Michigan and the Institute for the Study of Social Issues [ISSI] summer program in qualitative methods based at UC Berkeley).

Many universities also offer for-credit courses online directly or through platforms like Coursera or EdX. These can greatly expand available learning opportunities in ways that support both advanced study and access to a broader range of theories, methods, technologies, and approaches to participatory research. Participation in such efforts could be incentivized by organizing certificate programs for students and allowing faculty to earn teaching credit at their own institutions for being part of these multi-university efforts.

Inter-Institutional Infrastructure

Structured Learning Opportunities Outside Universities

Many groups outside universities provide opportunities for learning relevant to transformative research. There are networks, collaboratives, and “invisible colleges” (Crane, 1972) of scholars working in specific areas of scholarship (e.g., sociocultural theory, policy research to support just education policy, critical quantitative methods, etc.) and in collaborative research, who organize learning opportunities across institutional boundaries. Efforts such as the learning sciences’ Network of Academic Programs in the Learning Sciences (NAPLeS) and the Just Education Policy Initiative, as well as networks in other disciplines (Institute for Healthcare Improvement in medicine) are examples.

Transdisciplinary organizations like the international Methods Excellence Network (MethodsNET), which supports methodological pluralism across disciplinary and geographic boundaries, offer short-term workshops through an annual conference, summer school courses, and ongoing opportunities for networking around topics of interest. The Global Alliance for Inter- and Transdisciplinarity (ITD Alliance) supports researchers’ collaborations across disciplinary perspectives and has a working groups focused on exploring and developing academic careers for integration expertise (Hoffmann et al., 2022). The Transdisciplinary Training Collaborative created a guide for designing transdisciplinary learning opportunities which is housed on the ITD website (Transdisciplinary Training Collaborative, 2025).

Programs like these acknowledge that we often enter collaboration under conditions of systemic inequality and need to learn critical skills for facilitation to transform power relations between researchers and communities, educators, youth, and families. See, for example, the Building Movement Project, National Network of Educational Research Practice Partnerships, or the European Network of Living Labs. A new infrastructure might entail identifying and linking programmatic opportunities to a broader course of study in facilitation.

Mentoring Fellowships Outside Universities

There are mentoring fellowships outside of universities for which early career researchers can apply. Programs such as the National Academy of Education/Spencer pre- and post-doctoral fellowships provide opportunities for cross-institutional mentoring. Mentoring programs such as the William T. Grant Foundation’s Mentoring Grants to Support Scholars of Color and the American Evaluation Association’s Graduate Education Diversity Internship (GEDI) program provide opportunities for funding for building mentoring relationships that support emerging researchers. Providing such information to faculty prepares them to become effective advocates for students and for connecting them to mentoring opportunities. Another example of institution-level mentoring is the Cultivating New Voices Among Scholars of Color program of the National Council of Teachers of English. Established in 2000, CNV has mentored over 150 scholars. A similar initiative in mathematics education is the EMERG program funded by the Gates Foundation and carried out by the National Academy of Education.

Clearinghouses Cataloguing Learning Opportunities

Clearinghouses of learning opportunities at the institutional and inter-institutional level for specific course work and other opportunities to grow in transformative research are another kind of infrastructure that may benefit transformative research. One or more professional organizations might consider sponsoring the crowdsourcing of such a clearinghouse. Such clearinghouses help people build—with support of others—customized learning pathways to meet their needs, relying on resources outside their departments or schools to help fill in gaps in their learning.

Considerations Beyond Academia

While our emphasis has been on universities and collaboratives as the base for developing these capabilities and infrastructural supports, other entities beyond academia play important roles in enabling and constraining this work. These include publishers and editors of journals, research funders, and policymakers at the state and federal levels, including the Office for Human Research Protections and the Institute of Educational Sciences, which have been among the federal offices with the largest reach over the nature and quality of education research. Among the issues that could be profitably addressed by entities like these are:

- **Extended time horizons for transformative research programs:** Productive partnerships, collaborative research programs that take the complexity of educational systems into account, and capacity-building to sustain high-quality teaching and learning, take time to develop. Conventional project timelines of 3–5 years will need to be reconsidered to support transformative work including the work of partnership building and co-planning. This has implications for funding, including how funders might work together, for research policy, and for quality and productivity expectations to which researchers are typically held accountable.
- **Revised research policies, priorities, and standards:** Prominent research policies, priorities, and standards of entities like the Institute of Education Sciences (IES) at the U.S. Department of Education, the National Science Foundation, the Office of Human Research Protections, National Academies, and the American Educational Research Association have played a major role in shaping the research enterprise in ways that enable or constrain transformative research. Fostering critical discussions among heterogeneous groups of people with a strong interest in research about such guidelines in light of the goals of transformative research—how the guidelines enable and constrain research, what they foreground and what they ignore, how they position researchers and research participants—could prompt productive evolution. (See, e.g., NASEM, 2020, re IES; Hammond et al., 2020, related to organizations and collaboratives that sponsor research syntheses.)

Consideration Beyond Academia

- **Meaningful access to the growing evidence base for transformative research:** Here we refer to how the learnings from particular programs of transformative research—about the process as well as the outcome of research—can become accessible to research partners elsewhere and to the growing field of research partners interested in transformative programs of research (Coburn & Penuel, 2016; He et al., 2020; Vetter et al., 2022; Young & Johnson, 2024). A range of limiting practices underlie this concern: the tendency for researchers (and those who evaluate them) to privilege publications in academic journals, many of which are behind paywalls that limit access and are intended primarily for other academics in the same area; implicit and explicit criteria for review of manuscripts that risk disenfranchising less conventional approaches to research; the tendency for reports of research–practice partnerships to reflect retrospective first-person accounts rather than contemporaneous evidence of how a partnership unfolded (Penuel & Hill, 2019); limited attention to analyses enabling theory development across different approaches to and programs of transformative research. This suggests the value of concerted collective efforts in learning from and imagining alternative modes of sharing research in ways that are meaningful and accessible to the full range of people impacted by the system being studied and/or the research.

An Invitation for Reflection and Dialogue

We close with an invitation for reflection and dialogue about the ideas in this report. Our hope is that faculty and students in colleges and schools of education will use—and expand on—this framework as they reflect on their own learning and teaching. We also hope that organizational leaders will consider how their infrastructures might evolve to better support preparation for transformative research.

To those ends, we offer four suggestions for individual and collective reflection and planning. The first three suggestions focus on the capabilities associated with our Learning Domains; each focuses on a different purpose for reflection and planning. The fourth suggestion focuses on the Infrastructural Components and invites consideration of what components are in place within a given organization and how they might evolve to better support the kind of teaching and learning that prepares researchers for transformative research.

- Individual researchers, from graduate students to senior professionals, might reflect on their own learning and consider additional learning opportunities that they might want to pursue.
- Individual faculty responsible for teaching and mentoring researchers might reflect on a specific course, workshop, or other learning opportunity and how it might evolve to better support preparation for transformative research. Asking recent participants in the learning opportunity to share their reflections could provide additional information.
- Program leaders and faculty collectives might reflect on their curriculum—the set of opportunities available to learners—and explore ways in which the curriculum might evolve to better prepare researchers for transformative research.
- University and school/college leaders might reflect on the infrastructural components currently in place that enable and constrain teaching and learning and how they might evolve to better support preparation for transformative research.

Taken together, these planning/reflection suggestions might support a graduate program's effort at self-study, enabling comparisons across individual perspectives, dialogue about differences, and exploration of ideas for next steps toward preparation for transformative research.

Beyond these local dialogues, the field would benefit from opportunities for program representatives to come together across contexts where transformative research and preparation for transformative research is or might be occurring. Professional organizations and networks, national academies, foundations, and state and federal agencies have an important role to play in fostering these collective dialogues (whether digital or in person), making sure they are productively structured to foster shared learning, and providing resources to support the development of records from which other might also learn.

Field-level reflections reimagining preparation have historically been powerful levers of generational change in how fields conceive of their work. We hope the recommendations for preparation we've provided and the suggestions for infrastructural supports for teaching and learning of researchers will also be an engine for reimagination in education. This report and our task force will have been a worthy effort if it leads to reflection and dialogue within and across graduate programs, universities, research–community partnerships, and those responsible for field-level infrastructure. We invite such cross-institution dialogues as crucial means for growing our collective ability to contribute to transforming educational systems.

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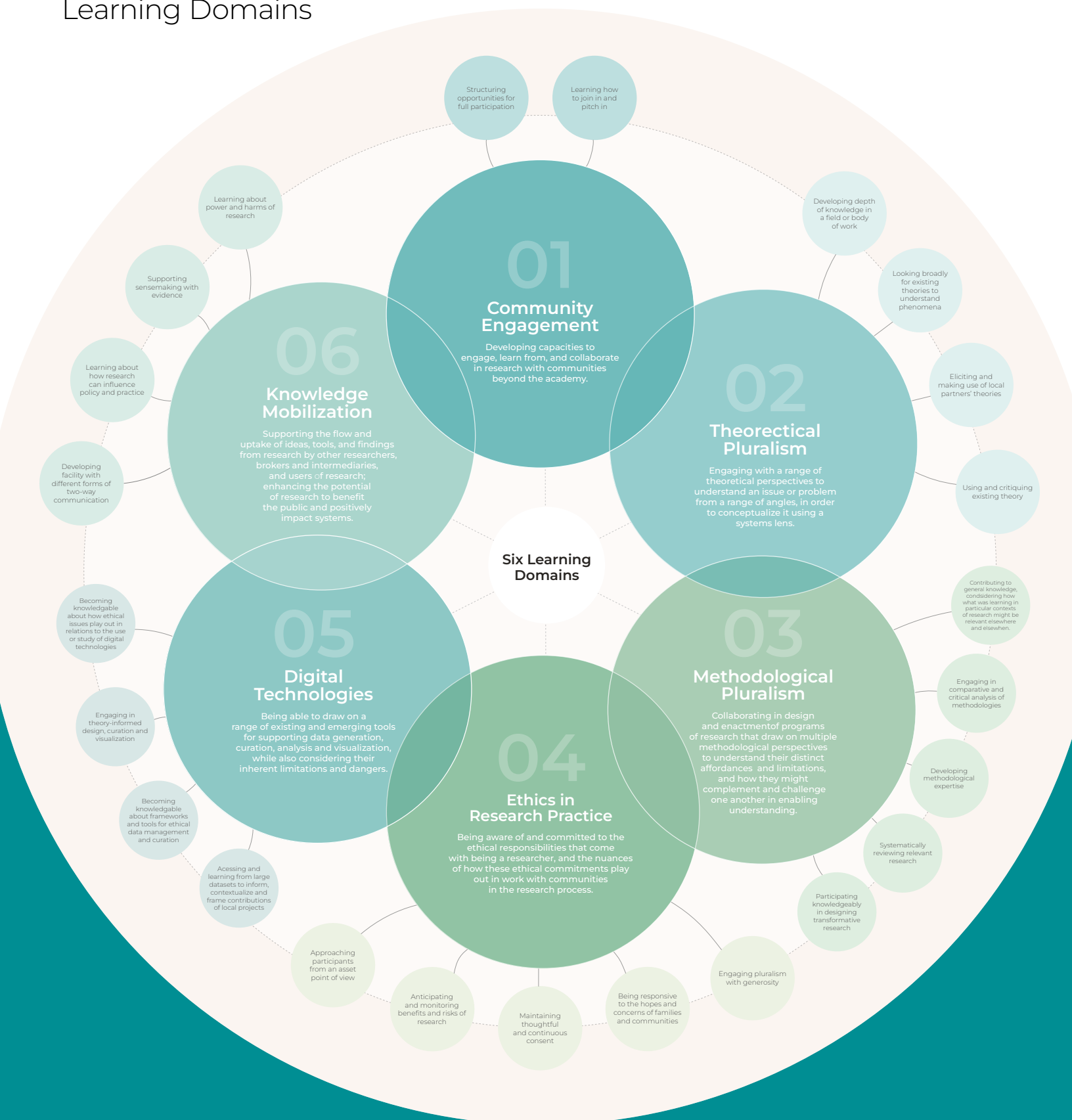
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Appendices

Preparation for Transformative Research Infographic

Learning Domains



Preparation for Transformative Research Infographic

Foundations

The supports, incentives, and infrastructures needed to facilitate researchers' learning and preparation to engage in transformative research.

Institutional Infrastructure

to support transformative preparation

Department heads and faculty leaders should consider infrastructural components at the Program and College or School level that facilitate learning and teach key capabilities for transformative research.

THESE MIGHT INCLUDE:

- Updating graduate admissions policies and procedures to attract a broad pool of applicants, particularly researchers with connection to the community with whom they will partner.
- Developing program-wide expectations for mentoring that support students in developing their own professional identities and expertise relevant to transformative research.
- Providing regular opportunities to engage in aspects of transformative work.
- Designing programs so students have integrated sequences of courses, apprenticeships and other learning opportunities needed to develop the capabilities described in the learning domains.

Institutional Incentives & Resources

to encourage transformative research

Deans and Provosts should consider the institutional incentives and resources at the college or university level that might encourage the development of teaching and learning infrastructures.

THESE MIGHT INCLUDE:

- Shifting balance of credit hour requirements toward apprenticeships within community-engaged research and research-practice partnerships.
- Rethinking faculty workloads to provide appropriate time and resources for co-teaching, for program and course redesign, and for building and sustaining relationships necessary for transformative work.
- Changing tenure and promotion guidelines to reward more public and engaged research.
- Establishing long-term, mutually beneficial institutionalized relationships between universities and local educational organizations, agencies, policymakers and communities.
- Creating reciprocal relationships with other universities to expand the courses and learning opportunities available to students.

Considerations Beyond Academia

Funders, professional organizations and other groups outside of the academy can also serve as critical partners for catalyzing and supporting transformative work.

THESE MIGHT INCLUDE:

- Providing resources for sustained relationships between universities and school and community partners.
- Creating fellowship and mentoring opportunities that build collaborative learning relationships across institutions.
- Creating clearinghouses to help people build customized learning pathways to meet their needs outside of their departments and schools to help fill in gaps in their learning.
- Fostering discussions about revising research policies, priorities, and standards that can better enable transformative research.
- Providing meaningful access to education research for all research partners and interest holders.

Spencer's Charge to the Task Force

It is a critical time in K–12 education and in higher education. It continues to be apparent that our systems are falling short of our goals for fostering deep, equitable, and relevant learning, and that this is occurring as both universities and K–12 school systems face new kinds of headwinds, including continuing funding shortages and disparities and the contentious political context with unprecedented restrictions and risks. There are open questions that will need to be addressed for the education systems we will need for the future: How do we reimagine education systems so that they truly serve all students? How do we lean into teaching and learning in ways that attend to the challenges that the COVID-19 pandemic created and exacerbated? How might education need to shift in the face of global challenges like climate change? How do we prepare students for the kind of civic reasoning and engagement necessary for a multicultural democracy? How do we best utilize new technologies while still attending to learning as a human process?

Education research continues to play an integral role in supporting individuals, communities, and institutions, particularly those that have historically been marginalized. Yet education research remains siloed, and far too disconnected from communities, practitioners, and policymakers, as well as from the challenges and opportunities in education systems. Furthermore, it is important to acknowledge that research has caused harm and has not represented the needs and desires of young people and communities.

In response to these challenges, The Spencer Foundation launched a set of initiatives in 2024 to support visionary programs of research. They hold at their center the goal of transforming education systems toward high-quality learning and teaching that honors students' whole humanity, their developmental needs, and their families and communities (Nasir, 2024). Critical to this is that education systems provide all students with “meaningful opportunities to study challenging material; develop a strong sense of agency and autonomy; make the most of their individual talents, abilities, and efforts; and have an educational experience that builds on their cultural and linguistic resources” (Nasir et al., 2021, p. 56). The goal includes supporting students in becoming “literate, knowledgeable, creative, and interpersonally and interculturally competent citizens and workers,” and prepares all students to participate productively in a multicultural democracy (Nasir et al., 2021, p. 56; Nasir, 2024).

Creating education systems that do this entails programs of research that focus synergistically on how educational systems work and the multiple factors that enable and constrain the quality of teaching and learning. We consider transformative research to be research that embraces these goals and that:

- is conducted in generative collaboration with educators, policymakers, practitioners, families, and community,
- draws on insights from multiple disciplines, theories and methods, and
- goes far beyond solely documenting the current state, to make significant movement toward change in policy, practice, or pedagogy in a way that impacts educational systems.

Transformative research requires transforming how we prepare researchers. As a funder of education research, the Spencer Foundation has a long history in supporting the development of educational researchers through fellowship programs and research training grants. We are committed to ensuring that the next generation of scholars is prepared to conduct transformative research.

Spencer's Charge to the Task Force

While transformation of educational systems necessarily entails many actors working together to create the conditions for change, one critical aspect of this transformation is research that works in service to education systems. Our focus in this charge is on re-envisioning the preparation of education researchers to engage in this work. To that end, the Foundation launched the Task Force on Preparation for Transformative Research and charged it with considering:

- the commitments and capabilities researchers need to engage in transformative research,
- how graduate training and other professional learning opportunities could be more intentional about preparing researchers for transformative research, and
- how the field might evolve its research and training infrastructures to better support these efforts.

The Preparation for Transformative Research Task Force involved scholars from across the U.S. whose interests spanned a broad range of methodological and theoretical perspectives and experience in collaborative work across levels of educational systems. The twelve members of the task force were: Megan Bang, Alex Bowers, Cynthia Coburn, Ezekiel Dixon-Romàn, Kara Finnigan (ex officio), Louis M. Gomez (co-chair), Andrew Ho, Carol Lee, Pamela Moss (co-chair), Richard Murnane, Na'ilah Suad Nasir (ex officio), William Penuel. Their academic bios can be found below.

We asked Task Force members to draw on their deep experience in the field to address these considerations, informed by focus groups with colleagues who brought diverse perspectives and reflected career stages and roles from graduate student to senior scholar. Our intention is to provide a preliminary framework to support those responsible for teaching, learning, enacting, or resourcing the preparation of scholars; to take stock of their progress in supporting preparation for transformative research, to imagine and design the next steps, and to envision possible futures. We hope this work will catalyze a field-wide dialogue that will grow our collective understanding and capacity for action. By doing so, we hope to be a part of a collective that leans into the possibilities of transformative education, for now and for the future.

Na'ilah Suad Nasir

President, Spencer Foundation

Task Force's Methods for Developing Report

Our charge was to draw on our collective knowledge and experience, informed by structured conversations with diverse colleagues, to provide a preliminary framework to support those responsible for teaching, learning, enacting, or otherwise enabling or resourcing the preparation of scholars, to take stock of their progress in supporting preparation for transformative research, to design the next steps, and to envision possible futures.

The Task Force (TF) met eight times between May 2023 and May 2024, with two all-day meetings in Chicago and six two-hour Zoom meetings. Between May 2024 and January of 2025, we worked asynchronously on drafting the report. The meeting agendas for the TF and suggested assignment for asynchronous work were codeveloped by a Steering Committee (SC) consisting of Co-Chairs Moss and Gomez, Spencer President Nasir, Senior Vice President Finnigan (until July 2024 when her term as SVP ended), and TF Member Bill Penuel, who joined the SC in July 2024.

May–December 2023: Learning from One Another and the Field

In 2023, a significant component of the TF's work involved learning from one another and from the field through focus groups and 1x1 interviews. Following a Zoom orientation meeting in May 2023, the TF's June in-person meeting focused on plans for learning from the field, including brainstorming focus group questions and a framework for purposeful selection of colleagues to invite. At the October Zoom meeting, we piloted and refined the protocol for use with the focus groups, learning more about one another's perspectives in the process. The protocol focused on questions for participants about (a) their response to Spencer's vision of transformative research, (b) educational experiences they considered relevant to transformative work, (c) their visions of preparation programs that could accomplish this work, and (d) what they saw as barriers to and leverage points for preparation in the various contexts within which they worked.

In October–November, under SVP Finnigan's leadership, we conducted 17 focus groups (with 5–6 members each) and 11 1x1 interviews with colleagues who could not join a focus group. Participants included faculty at different career stages engaged in education-relevant research with collective experiences spanning a diverse range of methodologies, theories, and contexts of research. They also included education deans, policy makers, program leaders, and current pre- and post-doctoral fellows sponsored by the National Academy of Education (NAEd)/Spencer Fellowships. These 90-minute meetings took place on Zoom except for meetings of NAEd/Spencer Fellows, which took place in person at their November retreat. The Zoom meetings were each co-led by a member of the steering committee and a member of the task force. The in-person focus groups for NAEd Fellows were led by NAEd members and staff attending the meeting. Finnigan conducted the (~45 min) 1x1 interviews.

All meetings were recorded, electronically transcribed, and proofread, solely for the purpose of creating summaries for the TF to use. Key ideas were excerpted and coded by broad organizational categories relevant to the questions. TF members reviewed the coded excerpts as we worked on relevant sections of our report.

At our in-person meeting in December 2023, we engaged in dialogues about ideas for the substance of the report informed by our collective perspectives, our personal experiences of co-leading different focus groups, and the preliminary analyses.

Task Force's Methods for Developing Report

January–December 2024: Planning and Drafting the Report

In 2024, we moved to planning the writing of the report. In January, co-chairs developed a prospectus for TF review based upon the December meeting; TF reviewed and suggested modifications to the prospectus at its February zoom meeting. Subgroups were formed and they worked on drafts of different sections between February and May, with check-in Zoom meetings in March and May (and ad hoc subgroup meetings as needed).

In July–August, coeditors Moss, Gomez, and Penuel developed a first full draft incorporating subgroup contributions. It was reviewed by the TF in early September, revised accordingly by the coeditors, sent to the TF again in November, and further revised by the coeditors. In December 2024 President Nasir invited confidential feedback from a diverse group of nine senior colleagues external to the task force.

January–July 2025: Preparing for Public Release

In January, the coeditors further revised the report in response to the external feedback, shared the confidential feedback and current revision with the TF, and requested a last round of comments from the TF. That draft was also shared with the Spencer Board and in an interactive session at the 2025 Annual Meeting of the American Educational Research Association. The coeditors revised the manuscript in response to the comments we received and sent it back to the TF for a final review and approval before public release.

Acknowledgements from the Spencer Foundation

We are very grateful for all of the collective time, energy, wisdom, conversation, and debate that went into the writing of this report. We started this work with a fuzzy vision of what we were hoping would come out of it; we had a notion that it was a good time for some collective thinking about the future of education research in order to think about scholarship in education could be more widely useful for educators, education systems, families, communities, and young people, guided by the principles of Transformative Research. The Task Force for the Preparation of Transformative Research exceeded our expectations in every way. We could not have asked for a group that was more thoughtful, more collegial, more willing to take up the hard questions in the service of the future of our field. We are also incredibly grateful for the many informants, thought partners, conversation partners, focus group participants, and critical readers whose thinking deeply informed our work. The best of the ideas in this report reflect their input; any errors are ours alone.

Task Force Bios

Megan Bang

Megan Bang is a Professor of the Learning Sciences and Director of the Center for Native American and Indigenous Research at Northwestern University's School of Education and Social Policy. She studies dynamics of culture, learning, and development broadly with a specific focus on the complexities of navigating multiple meaning systems in creating and implementing more effective and just learning environments in science, technology, engineering, arts, and mathematics education. She works closely with Indigenous communities and conducts research in both schools and informal settings across the life course. She currently serves on the Board of Science Education at the National Academy of Sciences and is a member of the National Academy of Education.

Alex J. Bowers

Alex J. Bowers is a Professor of Education Leadership at Teachers College, Columbia University, where he works to help school leaders use the data that they already collect in schools in more effective ways to help direct the limited resources of schools and districts to specific student needs. His research focuses on the intersection of effective school and district leadership, data science and data analytics, evidence-based improvement cycles, and the application of learning analytics, machine learning, data mining, and data visualization analytics to large-scale education data and data dashboards.

Cynthia E. Coburn

Cynthia E. Coburn is the Margaret Walker Alexander Professor of Learning Sciences and Human Development and Social Policy at the School of Education and Social Policy, Northwestern University. She studies the relationship between instructional policy and teachers' classroom practices in urban schools, the dynamics of school district policy making, spread and scale of educational innovations, and the relationship between research and practice for school improvement. She is a Fellow of the American Educational Research Association and an elected member of both the National Academy of Education and the American Academy of Arts and Sciences. Coburn has a BA in philosophy from Oberlin College, and a MA in Sociology and a PhD in Education from Stanford University.

Ezekiel Dixon-Román

Ezekiel Dixon-Román is Professor of Critical Race, Media, & Educational Studies at Teachers College, Columbia University, where he is the Director of the Edmund W. Gordon Institute for Advanced Study. He's co-founder of the Institute in Critical Quantitative, Computation, & Mixed Methodologies and co-founder of the Critical Computation Bureau. His work engages critical and cultural theory, media theory, anticolonial and Black radical thought, and philosophy of technology and science. He is also a co-editor of the Duke University Press book series, "ANIMA: Critical Race Studies Otherwise", a member of the Social Text Editorial Collective and the Communication, Culture & Critique Editorial Collective.

Task Force Bios

Kara S. Finnigan

Kara S. Finnigan is a professor at the University of Michigan. She has studied educational policies at the local, state, and federal level for more than 30 years. Her work focuses on issues of racial justice and equity in policy design, implementation, and outcomes. She has written extensively about accountability and choice, trust and leadership, and research utilization and mobilization. Finnigan's research blends perspectives in education, sociology, and political science and employs multiple methods, including social network analysis. She is currently studying connections between education and housing policies. She began her work in education as a substitute teacher in Alaska.

Louis M. Gomez

Louis M. Gomez is a learning scientist. His research and design efforts are aimed at helping to support community formation in schools, and other organizations, so that they can collaboratively create new approaches to teaching, learning and assessment. This work is aimed at helping the field take a new perspective on design, educational engineering, and development efforts that catalyze long-term, cooperative initiatives. Louis Gomez is Distinguished Professor of Education at UCLA.

Andrew Ho

Andrew Ho is the Charles William Eliot Professor of Education at the Harvard Graduate School of Education. He is a psychometrician whose research aims to improve the design, use, and interpretation of test scores in educational policy and practice. Professor Ho is a developer of a national archive of student achievement data (SEDA) and advocates for using educational tests for low-stakes monitoring in multiple-measures systems. He is the Immediate Past President of the National Council on Measurement in Education. Before graduate school, he taught creative writing in his hometown of Honolulu, Hawaii, and Physics and AP Physics in Ojai, California.

Carol D. Lee

Carol D. Lee is the Edwina S. Tarry Professor Emerita in the School of Education and Social Policy at Northwestern University. She is President of the National Academy of Education (through November 2025), a Past President of the American Educational Research Association, and a fellow of AERA, American Academy of Arts and Sciences, International Society for the Learning Sciences, the Reading Hall of Fame, and National Conference on Language and Literacy. Her research focuses on cultural supports for learning, both wholistic development and disciplinary literacies. She is a former high school English teacher and founder of three African-centered schools in Chicago spanning 50 years.

Pamela A. Moss

Pamela A. Moss is the John Dewey Collegiate Professor of Education in the Marsal Family School of Education at the University of Michigan. Her scholarship engages the critical potential of methodological pluralism in education research: how it is and might be theorized, practiced, taught, supported by organizational and governmental policies, and embedded in the evolving infrastructures through which knowledge is produced and used to orient action in complex educational contexts.

Richard J. Murnane

Richard J. Murnane, an economist, is Thompson Research Professor at the Harvard Graduate School of Education and a research associate at the National Bureau of Economic Research. Over the last four decades, Murnane has studied relationships between the U.S. economy and the U.S. educational system. Murnane is a member of the American Academy of Arts and Sciences and the National Academy of Education and is a Fellow of the Society of Labor Economists.

Task Force Bios

William R. Penuel

William R. Penuel is a Distinguished Professor in the Institute of Cognitive Science and School of Education at the University of Colorado Boulder. He designs and studies curriculum materials, assessments, and professional learning experiences for teachers in STEM education. He also studies how contemplative practices and critical inquiry can support educators in cultivating more compassionate schools. A third line of his research focuses on how long-term research-practice partnerships can be organized to address systemic inequities in education.

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