The Networked Design Development Model:
A Pilot Study of Cross-Site School Improvement

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Abstract

Schools typically work in isolation and struggle to sustain traction in solving complex problems of teaching and learning. To address this need, we brought together teacher leaders from twelve schools to be co-researchers in a networked improvement design development inquiry, which draws heavily on the networked improvement community and design development models of school improvement. These co-researchers designed, led the implementation of, and collected and analyzed data on a school-based intervention to address a common problem of practice related to teaching for deeper learning. Through an analysis of surveys, interviews, and observations, we present the following findings: teacher leaders' expectations regarding the time involved, collaboration, and structure of the network were partially met; teacher leaders' capacity to lead school-based improvement efforts was positively impacted by their involvement in the process; and teacher leaders were unevenly engaged in the process: there was high engagement in and value from bimonthly, full-day network sessions, and moderate engagement between sessions at their sites. We discuss the implications of our study and the potential of networked design development as a model for school improvement.

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Introduction

This study sought to evaluate how participation in a networked design development improvement effort impacts teacher leaders' engagement in the design experience and capacity to lead school-based improvement efforts. Additionally, and just as importantly, it sought to evaluate the design process as implemented in order to inform future iterations. Networked Design Development draws conceptually from *Networked Improvement Communities* (Bryk et al., 2015), *90-Day Improvement Cycles* (Park & Takahashi, 2013), *Design Development Research* (Mintrop, 2016), and *Diagnosis and Design Logic* (Spillane & Coldren, 2011) to describe a structured approach to developing educators' collective capacity to engage in iterative improvement work. In Network Design Development, educators from across sites come together to work on a shared design challenge, research the challenge in each educator's respective setting, consult the research literature related to the challenge, design a prototype solution, pilot and evaluate the design, and publish the results. During the 2018–2019 academic year, a diverse group of educators, including teachers, school and teacher leaders, and UVEI faculty was convened around a common interest in improving how educators can teach for deeper learning. Over the year, the network followed a set of design development steps to define a shared design challenge; research the challenge in each setting; collaboratively consult literature related to the challenge; create a prototype design; and pilot, evaluate, and revise the design.

The Research and Professional Knowledge Base Related to School Improvement

Many professional learning and school improvement initiatives fail to penetrate the "black box" of the classroom (Bryk et al., 2010) and impact instruction in the classroom with students (Cohen et al., 2003). Research suggests that effective improvement efforts that depend on site-based professional learning are enhanced when they incorporate cycles of inquiry that include new learning, application of skills on the job, reflection, dialogue with colleagues, and evaluation (Hawley & Valli, 2001; Fullan, 2014; National Research Council, 2000); and engagement of participating educators in iterative, distributed, and collaborative diagnosis and design thinking (Spillane & Coldren, 2011). Such inquiry processes are most efficacious when they enhance teacher knowledge and metacognition (Fullan, 2011; National Research Council, 2000). Participant evaluation of improvement efforts should incorporate multiple sources of evidence and practical measures of outcomes for student learning and/or teaching practices (Hawley & Valli, 2001), and use these measures as a tool for constructing an understanding of problems and evaluating the efficacy of design solutions (Bryk et al., 2015; Spillane & Coldren, 2011) while making appropriately limited inferences based on the evidence available (Mintrop, 2016).

This approach is a response to flawed educational innovation cycles and approaches to improvement in which leaders adopt research-based programs or best practices that ostensibly address a problem, but are not responsive to the complex conditions of classrooms. Innovation

in this context becomes about selecting the right package and attempting to implement it with fidelity (Mintrop, 2016). Professional development in this model tends to be focused on implementation and is episodic, superficial, and disconnected from recurring problems of practice in the school setting (Little, 2006). Further, the on-the-ground politics of change complicate implementation of such programs (Bryk et al., 2010). Despite these limitations, efforts to implement such research-based programs quickly and widely persist, and consistently fail to meaningfully improve instruction (Bryk et al., 2010; Mintrop, 2016).

According to Bryk et al. (2015), "Achieving successful change in complex work systems means recognizing that one cannot predict ahead of time all of the details that need to be worked through nor the unintended negative consequences that might also ensue" (p. 7). As an alternative to the prevailing method of implementing instructional change, this design development study evaluates an improvement process that draws conceptually on two inquiry-based frameworks for improvement work: *Networked Improvement Communities* (Bryk et al., 2010) and *Design Development Research* (Mintrop, 2016).

Conceptual Framework

Networked Design Development draws conceptually from Networked Improvement Communities (Bryk et al., 2015), 90-Day Improvement Cycles (Park & Takahashi, 2013), Design Development Research (Mintrop, 2016), and Diagnosis and Design logic (Spillane & Coldren, 2011) to describe a structured approach to developing teachers', instructional leaders', and site-based teams' capacity to engage in improvement work.

Developed by scholars at the Carnegie Foundation for the Advancement of Teaching, Networked Improvement Communities "unite the conceptual and analytic discipline of improvement science with the power of networked communities to innovate and learn together. In embracing improvement science, educators are able to draw upon a well-established set of tools and deep practical experiences" (Bryk et al., 2015, p. 7). The goal of this networked improvement effort is to "accelerate" and "engage actively many different individuals and institutions in the process" (p. 7).

Design Development Research is an applied approach to improvement research that seeks to connect an actionable problem to an intervention through a theory of action. The task in design development work is two-fold: On the one hand, design developers support educational environments by responding to urgent problems of practice that pose a design challenge in a specific context. On the other hand, they work in a systematic fashion toward designs that can be validated and transferred from one organizational unit to another (Mintrop, 2016).

90-Day Cycles (Park & Takahashi, 2013), which grew out of Networked Improvement Communities work at the Carnegie Foundation for the Advancement of Teaching, are a disciplined and structured form of inquiry designed to rapidly examine improvement needs in context, synthesize knowledge, and produce and test prototypes in support of improvement work. With any type of change effort, organizations inevitably encounter roadblocks to improving

performance and outcomes. Unfolding over distinct phases, 90-Day Cycles are intended to serve as a mechanism for organizing existing knowledge or generating new ideas to address thorny, contextual, and situated challenges. After bringing a team together around a shared area of interest and common "tough" problems, the phases of a 90-Day Cycle include:

1. Scanning: Reviewing the literature, interviewing experts, and data collection across the network of researchers.
2. Focusing: Narrowing the focus, designing an initial product, subjecting the initial product to the review of experts, and conducting initial testing and refining the product based on practical data.
3. Summarizing: Continue to test the revised product, analyze the data, generate a report, and convene the team to discuss how to use the findings of the report.

Once the phases of the 90-Day Cycle conclude, the team decides whether to engage in a new 90-Day Cycle that builds on the findings of the first cycle and/or publish their findings for use by other practitioners.

Taken together, these overlapping models of engaging in improvement work in specific settings, while benefiting from learning across a network of educators, inform the Networked Design Development approach described in this study.

Overview of Networked Design Development Approach to Improvement Work

When it comes to big decisions and strategic directions, effective leaders must seek to understand why things are the way they are in a school setting and use their diagnoses as the basis for mindful design and redesign (Mintrop, 2016). Diagnosis and design efforts are more productive for school improvement when they are the product of a distributed leadership effort (Spillane & Coldren, 2011). This diagnostic and design work is neither simple nor straightforward (Coburn, 2006; Spillane & Coldren, 2011) and requires sophisticated use of evidence, including but not limited to the use of various sources of data to construct an understanding of problems and evaluating the efficacy of design solutions (Spillane & Coldren, 2011).

The Logic of Networked Design Development

According to Mintrop (2016), Networked Design Development intends to respond to urgent problems of practice in specific contexts,

> amplif[ying] improvement work across the network by *sharing learning at every step of the design process across contexts*, creating more robust designs that can be transferred from one organizational unit to another. Practicality, impact, and transferability are the three most important quality criteria. (p. 2)

Networked Design Development constructs an "execution network," which is defined by a commitment to collective action. In an execution network, members come together around a well-specified common goal, work collectively to construct a problem of practice, develop a common set of improvement methods, and commit to sharing the network's innovations in an orderly way (Gomez et al., 2016). Successful execution networks have strong technical

guidance and explicit processes and protocols to develop a common problem, design, evaluation system, and language. In Networked Design Development, the network of teachers and leaders from various schools come together to collectively define a problem of practice in an area of interest or need (such as promoting deeper learning in classrooms), take action to address the problem, and share results among network participants and beyond.

Drawing on the broadly used "plan-do-study-act" framework that is a staple of improvement research (Bryk et al., 2015), Figure 1 summarizes the design development logic. First, a problem of practice is co-constructed by the network, and a design challenge is formulated. To address this problem of practice, design development requires a sound theory of action, a model or conceptualization that predicts how to move from a problematic state to a desirable one. A theory of action is then used to develop an intervention design, which is then implemented and evaluated across the network to see if the predictions contained in the theory of action are correct (Mintrop, 2016).

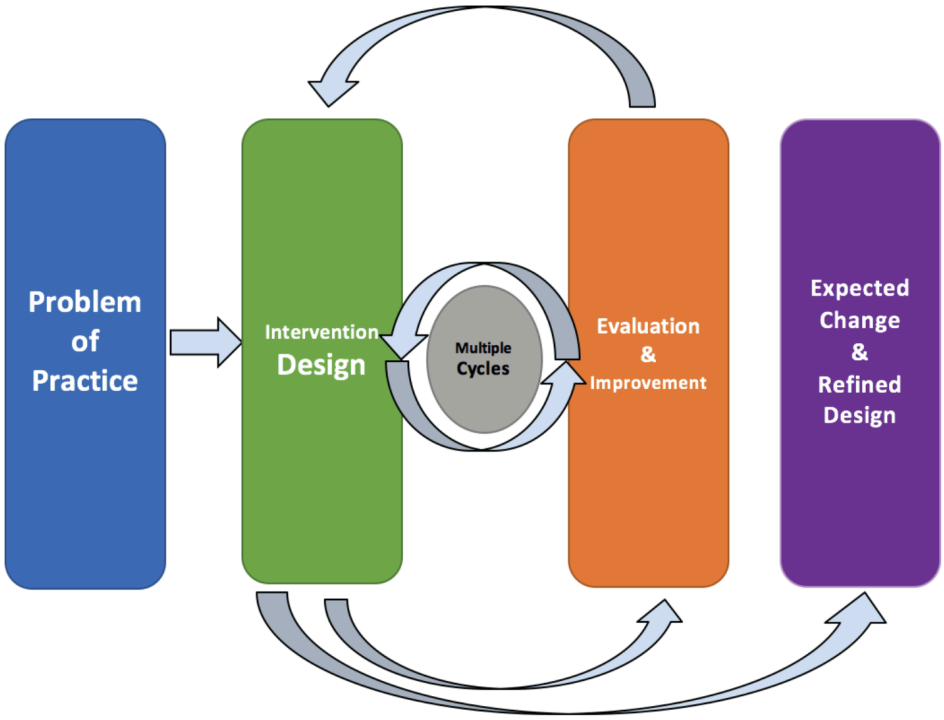


Figure 1: Design Development Logic Model (Adapted from Mintrop, 2016)

Developing the theory of action requires designers to be clear, when considering expected changes, about the design's proximal and distal goals (Mintrop, 2016). A short-term design, which a Design Development Network implements, cannot achieve a distal goal. But it can take an incremental step towards the distal goal. As Mintrop (2016) states, "It is this proximal goal of the intervention that needs to drive its design, implementation, and evaluation of impact" (p. 7).

The assumption underpinning this more incremental approach is that the proximal goals have value because research suggests they are likely to impact particular distal outcomes (e.g., if we increase student academic engagement in the classroom it will contribute to a diminished achievement gap [Bundick et al., 2014; Newmann et al., 1992; Kelly & Turner, 2009]), or that a sequence of interventions over a longer period of time are likely to address the distal outcome (e.g., improved instruction across a range of instructional domains are likely to decrease the achievement gap; we start with improving student engagement in the classroom with the idea that future design cycles focused on high expectations, use of discussion, effective feedback, differentiation, etc. will ultimately address the achievement gap [Skrla et al., 2004]).

This logic model in Figure 1 displays a feasible Network Design Development cycle within a single academic year. Across multiple iterations, which is necessary for incremental improvement, "the design can generate a set of practices that seem to work for an identified problem of practice and that give insight to leaders in other organizations wanting to address a similar problem of practice" (Mintrop, 2016, p. 2). When this improvement cycle is happening in parallel with development activities occurring in different sites at the same time, a network can learn from the ensemble of these experiences. This practice of learning-through-doing across sites leverages the learning of more educators and ensures that each process failure provides an opportunity to learn and to improve both locally and network-wide. At the same time, the testing of prototypes across a network increases the likelihood that the design that emerges will be more reliable at scale (Bryk et al., 2015).

Intervention Design

In this section we will summarize the phases of developing an intervention design in the NDD process. These phases include:

- Phase 1: (a) Choosing a topic and inviting participants and (b) Identifying a Shared Challenge & Developing a Theory of Action
- Phase 2: Piloting, Implementing, and Evaluating the Prototype Design
- Phase 3: Analyzing Data
- Phase 4: Writing Findings and Revising the Design

Phase 1a: Choosing a Topic and Inviting Participants. Preparation for a Networked Design Development process involves choosing a topic of appropriate scope, identifying a group of co-designers with a shared interest in the topic drawn from schools with teams of educators working in the area of interest (these co-designers and site teams form the "network"), articulating the deliverables and expectations for participation, and reviewing initial literature that will serve to develop a common vocabulary as a starting point for improvement work (Ward, et al., 2019). Deeper learning (Noguera et al., 2015) as a general topic was selected by the faculty of UVEI for this study on the basis of interest in related areas such as project-based learning, proficiency-based learning, and personalized learning that faculty members had observed working in schools across New Hampshire and Vermont. An initial invitation was sent through email in October 2018 to hundreds of educators across Vermont and New Hampshire, with several subsequent communications regarding the scope and sequence of the project. The

initial network included sixteen co-researchers drawn from twelve schools. Eleven of the participating schools were from Vermont, with the remaining schools from New Hampshire. Co-researchers included teachers, teacher leaders, and administrators. Six of the co-researchers were also graduate students at the Upper Valley Graduate School of Education. The network included elementary, middle, and high schools. Additionally, five faculty members from the Upper Valley Educators Institute joined the effort as co-researchers. Over the course of the study, three schools and five co-researchers withdrew as the demands of the project exceeded their available capacity. Each of the co-researchers subsequently convened a team of educators at their respective sites interested in co-designing and piloting a design related to deeper learning. The final number of participants included twenty-five site-based educators (eleven of whom were co-researchers and fourteen of whom were participating educators) and five UVEI faculty members.

Phase 1b: Identifying a Shared Challenge & Developing a Theory of Action. The network co-researchers were convened in November 2018 to examine the concept of deeper learning, orient the network to the nature of Networked Design Development methods, and launch Phase 1 of the work: constructing a relevant problem of practice, informed by a needs assessment and by consulting the knowledge base, and developing a theory of action intended to address the identified challenge.

Constructing a Problem of Practice. Networked design development improvement work requires the identification of a shared problem or set of problems that participants would like to solve across the network (Bryk et al., 2010). A problem of practice is an actionable problem of teaching and learning that is collectively constructed and shared across the network (Ward et al., 2019). For this study, UVEI faculty presented the network with a framework of Deeper Learning to guide in deciding on a problem of practice (see Tompkins et al., 2019). Potential problems of practice were explored in the initial convening (November 2018), and were refined prior to the second convening (January 2019) following a needs assessment and examination of the knowledge base. The final problem of practice, along with an initial theory of action, was agreed to by mid-February 2019 and focused on students' current collaborative skills (see "Finalizing the problem of practice" below).

Needs Assessment. In networked design development studies, before jumping into an extended effort, co-researchers must develop a clearer conception at the site level of the potential problems initially identified at the network level. After surfacing initial potential problems of practice, but before settling on a final problem of practice and theory of action, a local needs assessment (Mintrop, 2016), led by co-researchers, was conducted. The needs assessment included all of the sites in the network; and, in order to increase the general relevance of the study and understand the problem at a broader scope of schools, also included four sites engaged in deeper learning efforts that were not participating in the network. The needs assessment aimed to question assumptions regarding the topic, generate data on teachers' current practice in the topic area, and brainstorm potential remedies or solutions. During this phase, co-researchers used a focus group protocol, supplemented with informal

conversations, to bring assumptions and common problems to the surface.

Consulting the Knowledge Base. In addition to a needs assessment, co-researchers consulted the knowledge base to collectively better understand deeper learning, and potential problems of practice related to deeper learning, in order to develop a theoretical and research-based knowledge of the factors that explain and contribute to the problems identified by the network. Another aim of the consultation was to identify high-leverage or promising practices to potentially address these problems (Park & Takahashi, 2013), which would be developed by the network into a research-informed prototype to implement in the subsequent phases. For this study, the research base on transferable- and discipline-specific skills, higher order thinking, and deeper learning generally were explored and ultimately consolidated into a single knowledge brief related to deeper learning (Tompkins et. al., 2019). Once a problem of practice related to "teaching collaboration" was selected, the section of the deeper learning knowledge brief that focused on collaboration was excerpted and more fully developed (Tompkins, Downey, & LaRoche, 2019).

Finalizing the Problem of Practice. Ultimately, two potential, high-leverage, and generally relevant problems of practice were identified, with a the following problem of practice related to students' collaborative skills being selected as the focus for the study:

> The purpose of students' group work is based on decontextualized content and problems. Students and teachers have different notions of the goals and criteria for effective collaboration. Students' thinking in group work is private and not shared with their peers. When working in groups, students use teachers as primary resource for knowledge

Developing a Theory of Action. All this work was consolidated into a theory of action that identified the problem, described a change process, and articulated the desired outcomes. Following the second convening of the network in January 2019, a theory of action focused on supporting teacher practice in teaching collaborative skills was developed and agreed to. That theory of action was iteratively revised over the course of the study.

Phase 2: Piloting, Implementing, and Evaluating the Prototype Design. One of the primary purposes of Network Design Development research is the generation and testing of iterative *designs for learning* that will be taken up and further developed by future users. "An intervention design product consists of a sequence of activities that together, or in combination, intervene in existing knowledge, beliefs, dispositions, or routines in order to elicit new learning leading to new practices" (Mintrop, 2016, p. 7). The second phase of the project was focused on developing and testing a set of tools to support teachers practice related to cultivating students' collaborative skills.

The Design: Instructional Guidance and Professional Learning. For this study, a design was developed between the January 2019 and March 2019 network convenings. Drawing on the literature outlined above, the design was intended to support teachers in developing their

practice related to fostering students' collaboration skills as an aspect of deeper learning. The prototype design included an instructional sequence designed as an enhancement to units of study that include collaboration, an instructional framework that described teaching practices that support the development of students' collaboration skills, and a generic student rubric that described the skills of collaboration together with language stems. The prototype also included a sequence of professional learning collaborations to guide collaborative inquiry teams in exploring their practice together.

The design underwent several revisions but was guided by the awareness that effective designs are always minimalist (Wenger, 1998). The prototype was not intended to provide a script or detailed instructions about what participants should teach. Instead, it was intended to be a guide and the basis for discussion and negotiated understanding. The intention was that the value of the design would be in the deliberate practice, collegial learning, negotiated understanding, and adaptations educators and site-based teams made through their implementation and reflection. The prototype design was piloted between March and June 2019 across six participating sites. A full discussion of this impact and implementation of the design can be found in Tompkins et al. (2019).

Phase 3: Analyzing Data. Beginning with and following the final convening of the network in May 2019, the research team began to analyze and interpret the evidence of the design and its impact on teacher understanding and practice.

Phase 4: Writing Findings & Revising the Design. Following analysis, the penultimate phase of the Networked Design Development process involved writing findings and revising the design. Co-researchers derived conclusions about the impact and efficacy of the design based on the themes and patterns that emerged from data analysis, and drew on what was learned to revise and improve the design. This phase took place over the summer of 2019. The revised design can be found in Tompkins et al. (2019).

Phase 5: Disseminating Findings and Revised Design. Once the design was revised and the manuscript was written (Tompkins et al., 2019), they were shared at multiple conferences and with multiple schools during the 2019–2020 and 2020–2021 academic years.

Data Sources or Evidence[1]

Participants in this design study were UVEI faculty, MEd candidates, and educators in partner schools.

We drew on multiple data sources to evaluate the efficacy of our design:

[1] The purpose of the study was to understand the impact of the Network Design Development process on participants, and therefore the data collected focused on their perception and engagement in the process. Data and analysis on actual implementation of the design developed through the NDD process can be found in Tompkins et al. (2019).

- *Collaborative session exit tickets*: At the end of each of the four collaboration sessions, network co-researchers answered closed- and open-ended questions on the efficacy and value of the session and how they are currently thinking about deeper learning and their own capacity as leaders.
- *End-of-phase questionnaires:* At the end of each phase of the project, network co-researchers answered closed- and open-ended questions on the value of the project, the impact of the project on their leadership, and how their expectations had compared to their experience.
- *Exit interviews:* Interviews were conducted with educators who, for various reasons, left the network during the winter.
- *Artifacts from collaborative sessions*, including mind-maps, draft designs, and notes from discussions.

Findings

This study developed findings related to both the impact of the Networked Development Design on co-researchers' experience and an evaluation of the design process itself.

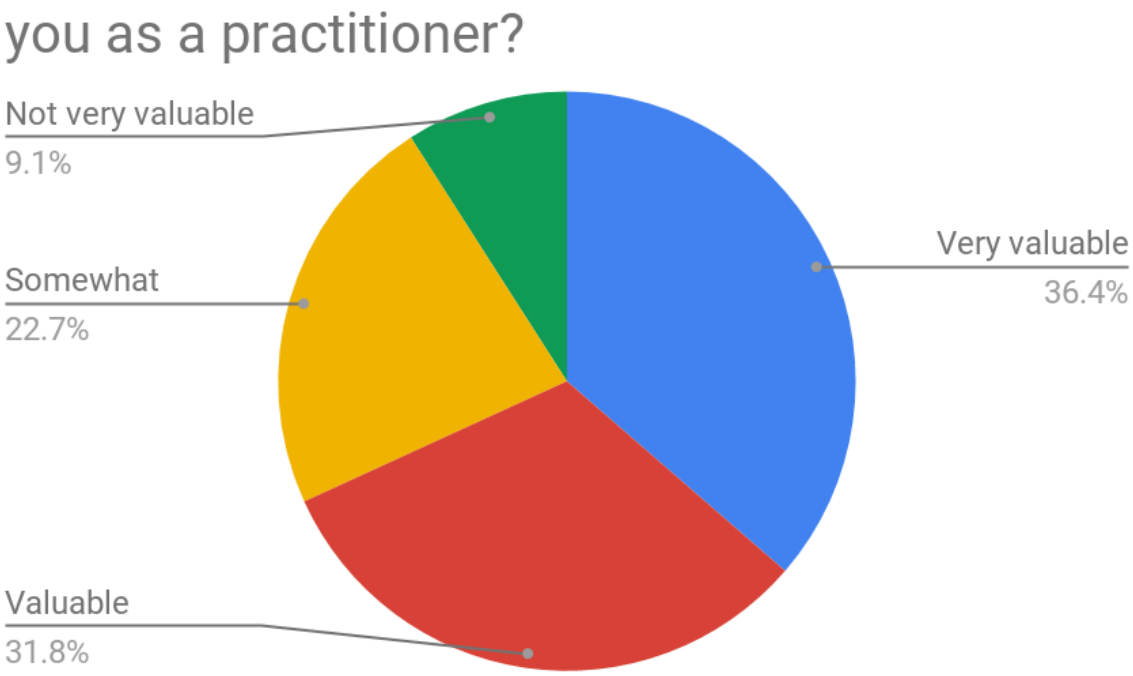


Figure 2: Impact of the NDD experience on participants as practitioners

Impact of the Design on Co-researchers' Experience: Engagement and Value. A clear strength of the design was the collaborative sessions, which took place every other month and marked the transition between phases. Each session was effective at engaging people in the collective work of the network (100% effective), and was almost as effective at meeting each session's goals (98%). A quote from a session 3 questionnaire illustrates this finding:

> I feel like this session brought me back into the work of the group. I feel like the work was focused, the conversation was deep and then the afternoon focused on tuning our morning work. I have a much better understanding now of where we are with the work.

Between sessions, during the phases of the session, engagement was more uneven. One researcher, at the end of Phase 2, stated,

> I don't feel engaged enough with this work. I feel like there has been a lapse between the work of phase one and now, so engaging the staff has been difficult. Thus I am not feeling particularly effective in my role as an instructional leader.

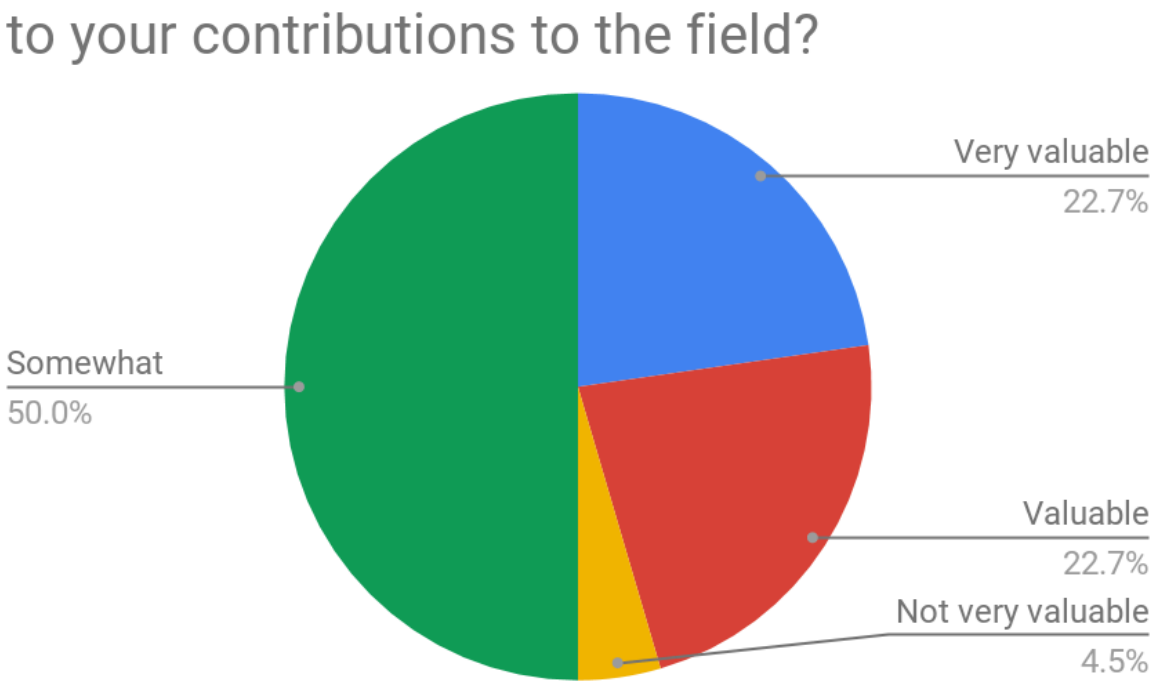


Figure 3: Impact of the NDD experience on participants contributions to the field

On the other hand, another co-researcher at the end of the same phase expressed a different sentiment:

> The teachers working with me on the research have embedded new frameworks/rubrics and initiatives around the collaboration efforts with their students. They are engaged with the process and talking about the effects the research is having on the quality of the learning experiences for their students. Bringing this research to my coaching has given me an explicit goal to focus on with the teachers that I'm working with.

At the end of each phase co-researchers were asked how valuable the network's work was to themselves as a practitioner, their site, and the field. Results from those questions across all phases are in the charts to the right. It is clear that overall there is significant variability in the value of the experience, but it was most valuable to themselves as practitioners (Figure 2, 68% valuable), followed by their site (Figure 4, 50% valuable), then to the field (Figure 3, 45% valuable). However, value to the site was highly variable, with several co-researchers choosing "not at all" or "not very." Toward the end of the project, there was a trend toward seeing the value and impact at their site, for them as a leader, and to the field.

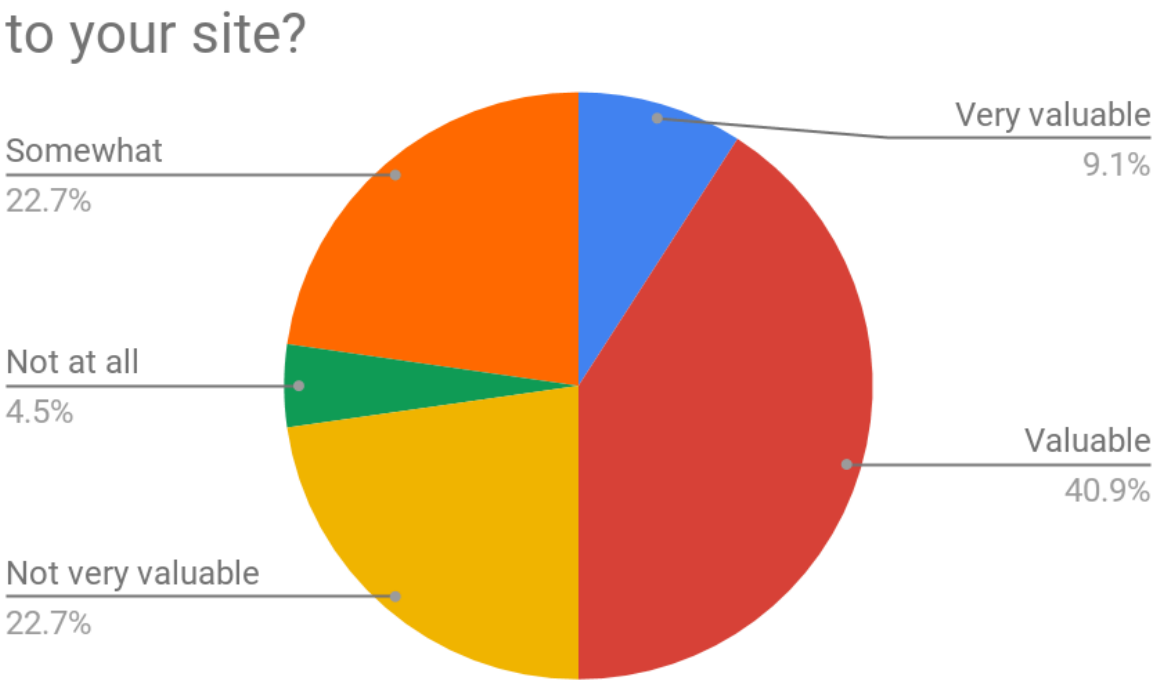


Figure 4: Impact of the NDD experience on participants' school sites

Impact of the Design on Co-researchers' Experience: Becoming a Better Leader. Co-researchers experienced changes in their capacity as leaders quite differently depending on their role at their site--specifically, there were different experiences for teachers and leaders because of varied roles and decision-making authority. Overall, there was a positive impact of the experience on participants' leadership skills.

For example, one participant wrote "The Network Design Development process has been effective in bringing educators at my school together to learn, discuss, and plan for improved collaboration. Already, our site team is talking about using this model as a PLC for next year." Another participant stated, "I now have experience coordinating and facilitating meetings." Those who felt the limitations of their leadership are exemplified by this quote, "I'm feeling pretty

good, but I have realized that being a teacher leader without being an administrator has some drawbacks, as I was not able to find/create good times for my site team to meet."

Impact of the Design on Co-researchers' Experience: Expectations. Co-researchers came into the project with different expectations related to the time and involvement needed to make the project successful, how collaborative the network would be, and how structured the experience would be. These expectations were sometimes met, but overall, as the project proceeded, the experiences of co-researchers diverged from expectations in three significant ways:

Time. Some co-researchers commented that the design process felt rushed, while others felt the process moved slowly. Additionally, some felt that there was not enough time to really make an impact. For example, "I really like the design, but we were not able to implement it in the way I would have liked. I would have liked to have had more time to implement it, instead of just a few weeks near the end of the year."

Collaboration. The process did not feel collaborative at times for some, while it exceeded the collaborative expectations of others. Sometimes the work was not transparent to everyone (especially in the creation of the design). For example, one co-researcher responded, "I feel that I am just giving feedback on a design that the [UVEI] faculty is designing."

Structure. Those who felt the process was somewhat unstructured experienced this as both a positive and a drawback. "I am not sure what I expected when I began this process, but I have enjoyed the collaborative nature. I was surprised with how unstructured it was, but after our first session I better understood the lack of hierarchy that allows all members equal say." On the other hand, "I knew this would be a bit unstructured, so I have been flexible."

Summary of Findings. Overall, the Network Design Development process logistically succeeded: formed a network; identified common problem of practice; developed, tested, and revised a design across sites. Participants in the project had a mostly positively impactful and valuable experience. On the whole, co-researchers were highly engaged with others in the network, but more unevenly engaged at their sites; they found the project to be valuable, moreso to themselves as practitioners; and they found the experience to be collaborative and mostly what they expected in terms of time, commitment, and structure.

Discussion

Below, we discuss three tensions, unresolved questions, and implications that arise from this study.

Scholarly Demands. Formal and informal feedback illuminated that a number of co-researchers were not expecting as much reading and writing during Phase 1 of the project. In fact, five co-researchers exited the network during Phase 1 because of the workload and differences in expectations. Our design expected all members of the network to contribute to

writing part of a knowledge brief. Based on this feedback, we altered our design mid-way through the year and did not expect all network members to analyze data and write findings; only UVEI faculty members and MEd candidates engaged in this work. Future iterations of Networked Design Development are wise to consider different levels of reading and writing demands throughout the project; for example, participants could read and comment on knowledge briefs rather than write them.

The Tension of Co-creation and Implementation in Emergent Design Work. This tension arose multiple times throughout the year. Several co-researchers stated they were not clear on what to communicate to potential site team members early in the process in terms of time commitment and focus area, the broad category of “Deeper Learning”. Furthermore, a few MEd candidates both felt somewhat disengaged from the design process and at the same time wanted to see faster progression. Key to the design process is mutual engagement and co-creation, which precludes coming up with a design ahead of time or even knowing details that would allow educators to make more informed decisions about their participation. A design question becomes, *How can we hold the tension between what we know ahead of time and what can only be known through the network’s mutual engagement?*

Scaffolding Site-based Engagement. The network in a NDD study process is composed of a variety of educators: education faculty, graduate students, school leaders, teacher leaders, and classroom teachers. All have different roles and expectations for design, implementation, and analysis. In this particular study, most partner educators who were recruited into the network did not have formal training in educational or design-based research. Therefore, expectations for site-based engagement were not clear, which led to uneven and minimal work at some sites (e.g., delaying in convening site-based educators, lack of data collection). Another design question is, *How can we scaffold site engagement without increasing the workload for education faculty?* Co-creation is hard and time-consuming, educators’ time is limited, and participants want to be involved. There are specific and complex skills involved in developing and implementing research-based designs in schools, which suggests the importance of training; at the same time, taking inspiration from 90 day inquiry cycles, the design needs to be developed and implemented in a timely manner.

Conclusion

Given the limitations of prevailing approaches to improvement work in schools, there is an urgent need for more sustainable, contextual, and durable approaches to developing teacher capacity and implementing improved approaches to teaching and learning. This study contributes, directly and indirectly, to the literature on Networked Improvement and Design Development research approaches, resulting in new insights into the process of engaging teacher leaders in this kind of work and by offering designs for organizing improvement work to the field.

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