Making Waves: Reflections on SEERNet's Progress Towards Enabling Next Generation of Education Research

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Introduction

When Digital Promise was named as the network hub for SEERNet in fall 2021, we set out to create a network through which platform developers, researchers, and practitioners could engage around a shared vision for research that would leverage the capabilities of Digital Learning Platforms (DLPs) in light of their growing use in teaching and learning at all levels of the educational system. We were joined by five initial DLPs, each separately funded by the US Department of Education's Institute for Education Sciences (IES) for their own program of work to enable external investigators to conduct research on their platform: ASU Learning @ Scale, E-TRIALS, OpenStax Kinetic, Terracotta, and UpGrade. In addition, Empirical Education serves as a partner to Digital Promise to lead the network hub's activities.

Distinctively, the collective work of these seven network members aims to enable DLPs to serve as research infrastructure. Our shared vision is that by leveraging DLPs as research infrastructure, researchers will be able to ask and answer important research questions in ways that are grounded in realistic, widespread use of learning technologies. Further aspects of the shared vision are grounded in the definition of the IES program that funds SEERNet and the DLPs. These include lowering barriers to research, increasing the relevance of research to practical uses of technology in education, and more rapidly realizing practical impacts from research by incorporating the lessons learned directly into the teaching and learning components of DLPs that have large scale use.

To advance towards this vision, IES is supporting a network that connects the five DLPs, a forthcoming set of research teams, as well as practitioners who use DLPs for teaching and learning and can shape research questions towards practical benefits. In addition to building the network across their different roles, network participants are further developing and demonstrating their alignment with IES's Standards for Excellence in Educational Research ("SEER") principles. The work of the network will span 5 years, and Digital Promise goals include synthesizing insights across the network, so that the field learns more about the advantages (and any challenges or limitations) of organizing research around DLPs as research infrastructure. Digital Promise also plans to support the network in disseminating its findings and broader impacts to educational audiences by leveraging our extensive, existing networks of school districts, researchers, and other educational stakeholders.

As SEERNet prepares to welcome the first cohort of researchers into the network later in 2023, the current SEERNet community—Digital Promise, Empirical Education, and five DLPs—convened in Chicago to reflect on the successes and challenges of our collective work, and map our future work. We were joined by our distinguished research advisors and IES program officers. Based on the convening, this paper discusses our network's shared mission and then describes the work of the network in three waves.

Mission, Values and Aspirations

The SEERNet community presently consists of teams organized under six different projects (the five DLPs and Digital Promise as the hub) who work both independently and together. The mission, values and vision described here reflect the work the network does together; it is not intended to limit the mission or aspirations of the individual teams, which have missions that go beyond the collective themes. Here we discuss the core of what the network plans to do together.

As discussed above, our vision is about enabling a next generation of research by developing DLPs as research infrastructure for asking and answering educational research questions. As discussed in our Chicago convening among those present, our mission is to create this infrastructure, then to enable and support others to do educational research using the infrastructure. More than just supporting generic educational research using DLPs, each DLP brings a perspective on the types of research questions that are valuable, practical, and distinctive to pursue—as to be expected, these perspectives are informed by the goals of their platforms and thus are distinct to each platform. Although perspectives on valuable research questions vary, it is clear that all DLPs want to support high quality research, as defined by the SEER principles.

Although the DLPs vary in their perspective on the desired topical focus of research on their platforms, they articulate shared values around how DLPs could improve the process of research, as follows:

- **Increasing the timeliness, relevance, and applicability** of research to practice by conducting research on platforms that are regularly used in situations of teaching and learning (in SEERNet, all five DLPs have more than 100,000 regular users).
- **Reducing barriers** for researchers to partner with DLPs to conduct research, for example, by providing well-defined protocols and processes that allow DLPs and outside researchers to work together. Likewise, reducing barriers for practitioners and student involvement as participants in the research.
- **Strengthening scaling and impact** after research shows desirable benefits by specifying well-defined ways that insights, findings, and improvements can be incorporated in platforms and reach more students, as well as through attention to generalizability, replicability, and additional external validity concerns.

Emerging from discussions at our recent convening, SEERNet participants shared two kinds of additional aspirations. These go beyond supporting particular research during the 5-year course of SEERNet towards creating a stronger knowledge base, set of tools, and research over all practices for DLPs as research infrastructure.

First, by working together, the network and DLPs aspire to provide a **set of models for research infrastructure**. The desired models would show how well-designed infrastructure can enable educational research. By specifying "models" and not a singular "model," we acknowledge that each DLP is pursuing different paths to designing its infrastructure and that complete convergence is not within the networks' current scope or desires. Further, SEERNet sees that there are many platforms beyond these five DLPs that could consider themselves as providing infrastructure to research, and believes that, based on the diversity of DLPs in this network, SEERNet can provide a range of examples to others to guide their development of parallel research infrastructure.

Second, both individually and collectively, the participants want to **contribute to new and better ways of doing research in the future**. During the convening, participants articulated four kinds of advances in educational research that they would like to see emerging from efforts by the SEERNet participants, as listed below:

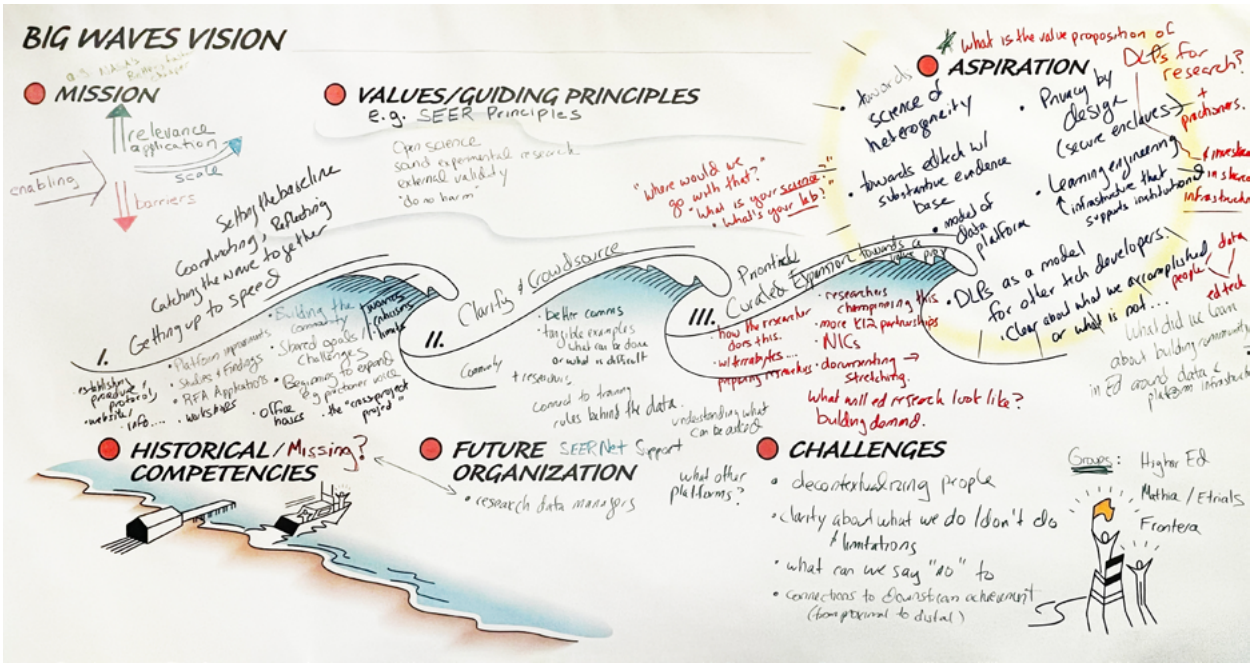
- **Better science:** how infrastructure can enable research with greater openness, external validity, utility, replicability, and other desired properties.
- **Better engineering:** how infrastructure can be engineered to enhance privacy, enable greater uptake of research results into products, and support learning engineers to utilize emerging findings in broader applications, etc.
- **Better contributions to practice:** how infrastructure can lead to research that better involves practitioners and more directly and productively informs their everyday teaching and learning
- **Better community:** how infrastructure can support communities of researchers, practitioners and developers that are more inclusive and work better together.

Three Waves to Our Work

During the 2023 SEERNet convening, participants realized that their vision, mission, values and aspirations are wide ranging, and to focus the conversation and the work, it would be helpful to define three waves of the work. These waves, sequenced in time, would ultimately create the swell needed to achieve important advances over 5 years. The three waves were defined as (1) establishing the foundation, (2) clarifying research opportunities and supporting initial research, and (3) pursuing broader aspirations.

In this paper, we discuss each of the three waves in our work, reflecting on the progress and challenges so far in Wave 1, and looking forward to future priorities, opportunities, and potential challenges. Our hope is that this paper serves not only as a status update, but also inspires researchers, additional DLPs, and practitioners to engage with us in this critical work.

Image 1: Artifact from the April, 2023 SEERNet convening



First Wave: Establishing the Foundation

The first wave of our work took approximately 1.5 to 2 years. This work established the foundation for using DLPs as a research infrastructure. A first set of activities was specific to this goal and included preparing the platforms, defining how researchers could propose studies, and conducting early studies using the platforms. A second set of activities was more general and included building the network community, defining the network's equity focus, including practitioner voice, and considering how and when we would involve affiliate DLPs (affiliate DLPs would share aspects of our vision and mission and be engaged in similar work but would not be funded by IES under this program). We briefly describe what was accomplished below.

DLPs Prepare Their Platforms

Each DLP worked to prepare its platform for use as a research infrastructure. This work differed by platform and included activities such as the following:

- Defining how the research infrastructure portion of their effort would be related to the educational service delivery portions, which required thinking through how research infrastructure and educational services were both separate and related.
- Refining platform software for managing and running experiments, which included understanding the kinds of data collection and analysis issues that would arise when the platforms were used in realistic settings, and designing approaches and algorithms to preserve the quality of the research.
- Developing privacy-protecting mechanisms, which included mapping the kinds of private information in the platform, understanding the stakeholders that would have to sign off on privacy protections, and creating processes and mechanisms to preserve privacy.
- Enhancing the tools and supports for defining, running, and analyzing an experiment on the platform and/or conducting analyses of existing data.

Together, DLPs, SEERNet and IES also worked on the pragmatics of a Request for Applications that would bring third-party researchers into the network and allow them to conduct research on the platforms. IES, of course, has sole responsibility for defining research solicitations but needed to check with DLPs on what would be practical; completely determining feasibility of a research project on a DLP at proposal time would be impractical. Therefore, this RFA required that researchers submit their broad research concept and a request for a letter of feasibility to the DLP, and post-award, to build in a 6-month planning process to resolve any implementation challenges.

As the network hub, Digital Promise, along with Empirical Education, developed two key resources to support researchers in conceptualizing their research and writing their proposals. The first was a research guide, Conduct Research on the Digital Learning Platforms, which provided a comprehensive description of each platform's capabilities throughout the research process. The second resource, 5 Ways SEERNet Can Help You Write a Strong Proposal, was designed to help researchers ensure that their proposal was not only feasible but also aligned to the IES SEER principles. SEERNet and DLPs also hosted office hours to support proposers.

During this preparation phase, some of the DLPs supported specific research projects. By doing so, they both learned more about how to support research and worked towards research insights that were meaningful for their platform. For example:

- ASSISTments supported experiments on remediation, such as Identification, Exploration, and Remediation: Can Teachers Predict Common Wrong Answers?
- A project at Mathia investigated whether a writing guide for the language used in instruction could lead to more effective instruction.
- A project hosted by the Terracotta team explored the effects of retrieval practice on student learning.
- ASU's Learning @ Scale has explored the question "What contributes to a course profile and do those elements have an impact on student outcomes?" as a way for the team to validate their researcher intake and data request/data pull processes in order to streamline all future research requests.

Developing the Network Community

The strongest networks have a strong sense of community, and a strong community is built on relationships. Building relationships takes time, but relationships are also what enable a network to be a change agent (see Axner). Although some DLPs knew one another well, not all participants had equally strong relationships. Thus during the first wave, work of the Digital Promise team as the hub leader centered around relationship building. Network hub leaders met one-on-one with each DLP and got to know their proposals and their platforms. At monthly all-DLP meetings, Digital Promise facilitators dedicated time to celebrating DLPs and the network's accomplishments. Members shared conference travel plans and took every opportunity possible to connect in person. The hub's community building efforts created what Bethany Weigele from ASU called a "safe space of a sounding board" where network members could discuss challenges related to IRB and GDPR and raise other sensitive topics.

The network participants worked on outreach to researchers together, for example, by co-presenting workshops or panels at learning analytics conferences. As it turned out, shared outreach activities were also great community-building activities. In one of many examples, network participants collaborated on a workshop for the 2023 Learning and Knowledge Analytics Conference, and Debshila Basu Mallick from OpenStax shared that it was an enjoyable experience and way to get to know everyone better. Regarding outreach, the network also worked together to develop common processes and to develop resources that would support the call for researchers to join SEERNet (the upcoming section, Expanding the Network: Bringing Researchers into SEERNet, will discuss this in more detail).

A third aspect of the community-level work was defining our equity focus. The 2022 IES Principal Investigators Meeting was centered around the theme Advancing Equity and Inclusion in the Education Sciences, and the keynote from IES Director Mark Schneider explained the addition of the new equity standard. As we unpacked this standard, we worked with the DLPs to develop the definition of equity in the context of SEERNet, to create equity-centered scenarios and personas, and to identify and share examples of what equity-centered research might look like in their platforms. We quickly recognized that this was going to be even more challenging than expected. While we have not yet come to a full understanding of how equity-relevant data could be obtained, merged with platform data, and used to support analyses that

include diversity, equity and inclusion questions, we have started to explore the relevant challenges in the white paper Navigating the Tensions: How Could Equity-relevant Research Also Be Agile, Open, and Scalable?

A fourth aspect of the community-level work was understanding how the community could and should grow. Heeding the call of the National Academies 2022 report that urges, "The research process needs to begin in the field" (p. 80), Digital Promise focused our attention on how we might begin to incorporate practitioner voice into the network. Originally, we set out to develop a database of education partners that would be interested in participating in the research to be conducted by network members. As we learned more about each DLP's modes of engagement with schools, we found that a common database across the DLPs would be unlikely to work. We explored the idea of a "footprint" report, where researchers could get a sense of the districts and states where the DLPs had been adopted, but this posed challenges for some DLPs with the release of customer information. As a result, we developed a broader approach that would not simply identify educators but engage them in SEERNet's work. In particular, Digital Promise as network lead:

- Published Practitioners at the Center: Catalyzing Research on Problems of Practice in Realistic Settings, which proposed guiding principles for practitioner engagement.
- Hosted a series of conversational Office Hours in which researchers and practitioners identified problems of practice relevant to DLPs and co-design of research questions (see Reflections on Researcher-Practitioner Co-design of SEERNet Research Questions).
- Launched a SEERNet practitioner advisory board to engage K-12 educators and leaders in conversations about what is meaningful and relevant to the field and how to disseminate findings, with the goal of them becoming a sounding board that can potentially help broaden our impacts in new ways.

We also thought about how the network might eventually expand beyond 5 DLPs to other platform providers who wish to offer research infrastructure. We recognized that the vision, mission, and aspirations of SEERNet members (as described earlier) are broader than any single funding program. We believed that other DLPs or researchers would have a desire to contribute to the mission, even without the direct stimulus of a DLP grant from IES. Because of the other demands in this first wave, we have focused on articulating low-intensity tactics that can create the foundation for future platform participation, rather than immediately expanding.

Reflecting on the first wave, the greatest challenge was developing the right levels of mutual knowledge and coherence, yet with respect for differences in each of the six projects of the Wave 1 network. Each of the six participants in SEERNet was independently selected by IES peer review, without prior knowledge of each other. Consequently, each has different project objectives, milestones, pacing, etc. Moreover, the approaches to the broad vision of DLPs as research infrastructure are different. Thus, a considerable effort during the first wave has been to understand what the shared core of the network should be and how this shared core necessarily falls somewhere midway between a singular, unified approach and a loose federation of mostly independent efforts. As the first wave now wraps up, we can move forward on the basis of a much better sense of this shared core than when we started.

Second Wave: Clarifying Research Opportunities and Supporting Initial Research

As we move into the next wave of this work, our attention focuses on welcoming new researchers to SEERNet and supporting their investigations. Key activities in this wave will include onboarding researchers and establishing study feasibility; supporting the research processes and sharing progress & outcomes; enhancing network communications; achieving greater clarity about the limits of what research can be supported in the DLPs; and continuing the network's development of ways to engage practitioners, develop equity-relevant research, and connect with related efforts.

Onboarding Researchers and Establishing Study Feasibility

We expect that we will know the results of the RFA for researchers by September 2023. As we enter into work with them, we will be trying out many different approaches to using DLP-based research infrastructure. This parallels what happened in Wave 1 where five different DLPs and the hub were separately chosen; now research projects will be separately chosen and later their objectives, activities, and insights will be integrated into the network's approach. As mentioned above, proposers were required to obtain a feasibility letter from their target DLP; thus, a baseline of feasibility is in place. However, the grant awards will specify a 6-month process of ironing out further specific feasibility issues to ensure that the work can be supported on the DLP. Much of this work necessarily will occur between a research team and a DLP, and yet the network hub will also look for ways in which we can support success across the mix of research awards and host DLPs. This 6-month period will also give the network a chance to understand limitations of/boundaries around what is possible within the DLPs. And if the researchers are pushing the bounds, how the DLPs respond. As a network, we may be able to improve our descriptions of the various capabilities and point to common features/limitations.

Supporting and Tracking the Research Progress

Each DLP will then support one or more funded research projects to do their research. We expect this will entail working out many details within each research team-DLP relationship. In addition to supporting each of these relationships, we want to learn across them. For example, are there any common types of obstacles that arise? Do best practices emerge that might be more widely shared throughout the network? Are some of the values and aspirations of the network easier or harder to achieve? During this time, SEERNet will share updates with the field about progress. We also expect that there may be some good opportunities for webinars about how the work is proceeding and how challenges are being resolved, even before findings surface.

Clarifying What Research Can Be Supported

At the Chicago convening, many DLPs and advisors commented that the idea that pursuing endless possibilities for research questions and approaches using DLPs is probably neither realistic nor most productive. For example, although a given DLP might theoretically support a research question about change in teaching practices, most currently better support research questions about student learning. Although a given DLP might conceivably support research approaches that capture multimodal data (e.g. eye gaze, gesture, body position), most currently better support research approaches that focus on how students directly interact with the platform while they learn.

Realistic infrastructure likely serves some kinds of research approaches better than others, and having a sense of what research would best fit an infrastructure would allow new researchers to more easily propose feasible projects. Hence, the SEERNet hub and DLPs agreed that one goal during the second wave is to become clearer about what kinds of research each DLP infrastructure can best support. Borrowing a phrase from SEERNet Advisor Andy Krumm from University of Michigan's Learning Health Sciences department, "What's your science? Where's your lab?" A related goal can be building capacity for researchers to use DLPs as research infrastructure.

In the second wave, we'll grapple with defining boundaries for each DLP and for the SEERNet network as a whole that accepts limits, understands what the infrastructures best enable, and could result in meaningful research to each type of constituent (e.g. schools, developers, researchers, funders). We also need to understand how to encourage researchers towards approaches for which the process-oriented benefits of using a DLP are most likely to be realized; these may be approaches that build on available infrastructure without too much additional handcrafting of the DLP to suit the research plan. We will seek to describe these boundaries and also to give concrete examples from the funded studies. We will also highlight the ways in which the research opportunities within each DLP can address equity-related questions.

Further Developing the Network

As described in Wave 1, Digital Promise and Empirical Education moved from a "database" of practitioners to a practitioner advisory group. In Wave 2, the SEERNet hub will seek to understand how practitioner advisors (as well as research-based advisors) can help each participant in the network to make their research more powerful. As noted, the important SEER "equity" principle was added during Wave 1. In Wave 2, we will continue to develop an understanding of how each research project aligns with SEER principles, with a special emphasis on understanding how the equity principle can be strengthened in the work. Further, we will begin to connect with DLPs beyond the five currently in the network, so as to understand what they are learning (or want to know) about how DLPs can serve as research infrastructure.

Overall, therefore, developing the network in Wave 2 involves two things. First, as the network lead, Digital Promise will seek to foster strong relationships and collaboration among the funded partners, which now will include research teams. Secondly, we will seek to foster expanded learning among partners within and external to the network. As we develop our communications and outreach plan (described below), we will focus attention on HBCUs, MSIs, and training institutes so that we can continue towards our efforts of broadening participation. Both we as a community and IES value efforts to increase the diversity of those who seek and obtain research funding, bringing a greater range of research skills, experiences and approaches to our field's efforts to serve the full diversity of students and teachers in American schools.

Building Capacity to Conduct Research in DLPs

Related to our network development efforts, participants recognized the need for new types of training that will prepare a diverse set of emerging scholars and future researchers to use DLP infrastructure to conduct research. For example, in a partnership among University of Pennsylvaina's Graduate School of Education (PennGSE), Digital Promise, and the University of Florida, PennGSE is offering a Data Science Methods for Digital Learning Platforms certificate. The 17-week program, with modules facilitated by 14 experts in different areas of learning analytics, provides learners with hands-on experience in understanding

and applying a range of intermediate and advanced data science methods on real digital learning platform datasets, as well as space to develop their professional identity in equity-oriented data science. There will be five cohorts of fellows over three years, with the first cohort beginning in February 2024. There is no cost to participate in this program, thanks to funding from IES (Grant R305B230007 to the University of Pennsylvania).

SEERNet will also explore strategies for connecting platform developers with researchers to discuss the research that can be supported in their platforms. These types of capacity-building workshops and webinars will help researchers better understand the topics and questions that are well-suited to these platforms. As supporting resources, we will also publish working papers that describe families of related investigations, such as a set of hypothetical studies from three DLPs on how clear, precise, engaging, and contextually relevant language might enhance student learning in mathematics. These papers will help build the knowledge base of the types of research possible and build researchers' capacity for writing feasible proposals.

Communicating What the Network Is Learning

Once research begins, there will be more to share about research findings emerging from the network, as well as insights about research processes when DLPs are used as research infrastructure. This includes using the network's breadth and reach to champion the work done on each platform. By publicizing the ongoing studies, we hope to motivate other potential researchers to engage with SEERNet. Where possible, the SEERNet hub will also seek to compile a compendium or synthesis of research insights and findings emerging from the work, so as to provide a starting point for those who want to learn more.

As described above, SEERNet will both make specific research findings, and learn about research processes that emerge when DLPs are used as research infrastructure. A likely focus in annual convenings among the network will be on these processes: What's working? What's still difficult or time-consuming? What can be improved?

Third Wave: Expanding Towards Broader Aspirations

The assembled network participants at the Chicago convening realized that the Wave 2 work is important and will require effort, yet will not necessarily realize all the ambitions that network participants hold (as described as the vision, mission, values and aspirations earlier). Therefore, the participants described a third wave as a place for realizing broader goals. The plans for this wave are necessarily less precise. Nonetheless, it was clear that network participants are passionate about these broader goals. Further, participants see the potential for DLPs and for the network to gain funding from sources beyond the current IES Request for Applications—funding may come from other federal sources, states, philanthropies, and more.

Naming these broader aspirations as a third wave creates space to continue to discuss broader goals and opportunities, even as the network participants move from the specific requirements of Wave 1 (establishing foundations) to those of Wave 2 (clarifying research opportunities and supporting initial research). We describe the third wave in terms of the four kinds of "better" that network participants seek, acknowledging that individual participants vary in which kind of "better" they are most passionate about or where their work is most aligned.

Better Science

At the Chicago meeting, participants noted that the Wave 2 research is being crowdsourced from proposals, and this may result in a diffuse set of research projects. A complementary push could be to "curate" a collection of research projects that would pursue a particular scientific goal cohesively. This would build on an understanding from Wave 2 of what kind of scientific work best suits each DLPs ("What's your science? What's your lab?"). One advisor imagined a "science of heterogeneity" where a DLP infrastructure allowed many research teams to look at the same research question with different approaches to learner variability. Defining multiple successful approaches to achieving equity in diverse populations would be an outcome that is hard to achieve without a shared infrastructure.

Better Engineering

At the Chicago meeting, participants also discussed technical advances to research infrastructure in order to better protect privacy, such as secure data enclaves. These are beyond the scope of Wave 2 as well, yet are important to making equity-relevant research easier to conduct on DLPs. Another idea that was shared is how to organize research so that new alternative supports for student learning compete with the best available supports on the platform; this could establish an engineering process for incorporating insights into the core product more rapidly. More generally, A/B testing is widely familiar to educational software companies but more often deployed for usability testing than for finding the best way to integrate evidence-based insights on learning processes into platforms. Better engineering could support the edtech industry more broadly to expand a successful industry practice but with a shift in focus from usability to learning processes.

Better Practitioner Engagement

As mentioned earlier, deeply engaging practitioners in research can lead to research with stronger impacts in practice. As SEERNet develops traction in its specific research projects, it will be easier to frame a next set of questions that not only further engages practitioner perspectives but also leverages the clarity from Wave 2 about what kinds of research questions are best supported in the DLPs. We can imagine opportunities arising in existing researcher-practitioner partnerships (such as those who belong to the National Network of Educational Research Practitioner Partnerships) or Networked Improvement Communities (such as those launched by the Carnegie Foundation for the Advancement of Teaching). We can also imagine opportunities where particular state education agencies or local education agencies have invested in a DLP and would sponsor research using that DLP infrastructure to address questions of importance at the local level. Finally, we note that so far it has been easiest to imagine practitioner engagement in K-12, but this needs to be expanded to include higher education over time.

Better Community

The Wave 2 community for SEERNet includes the five DLPs, some number of awarded research projects, and the SEERNet hub team of Digital Promise and Empirical Education. We imagine that one expansion to the community could better include diverse emerging scholars (for example, those who participate in IES training programs). In addition, the SEERNet hub team would like to better include scholars at HBCUs and minority-serving institutions through specific outreach. Better community also likely includes more intentional relationships with DLPs who share an interest in the SEERNet vision.

Conclusion and Call to Action

At the conclusion of a first wave of work to establish the foundations for a SEERNet research community, participants in SEERNet met in Chicago to review what was accomplished and what lies ahead. Our shared vision is that by leveraging DLPs as research infrastructure, researchers will be able to ask and answer important research questions in ways that are grounded in realistic, widespread use of learning technologies. Underneath this vision, there is both very specific work ahead (in Wave 2), and there are more ambitious goals to pursue (in Wave 3). Much as ocean waves have no clear beginning or end, these waves will not necessarily be sequential; they may overlap.

The broadest aspirations resonate with the well-known categorization of science via Pasteur's Quadrant (Stokes, 1997). Pasteur's Quadrant is named for Louis Pasteur, who conducted research that was both foundational and inspired by use (and applicable to practical problems). Likewise, SEERNet participants seek research that is both use-inspired and foundational. By positioning DLPs as research infrastructure, use-inspired research questions become easier to investigate—because DLPs are systems used widely in education. Yet the desired research would go beyond A/B testing as it is deployed to improve the usability of educational technologies; the desired research would explore how foundational principles can lead to better learning processes and outcomes, and conversely, how the principles need to evolve to better account for the nuances of learning processes as they occur on digital platforms. Seen through this lens, developing DLPs to better serve as research infrastructure could lead to a next generation of educational research in Pasteur's Quadrant, a generation of educational research based around the learning platforms where learners now spend much of their learning time.

It's also clear at the end of Wave 1 that the broadest aspirations in the SEERNet community will not be realized by the present network members alone. Therefore, we welcome additional developers, researchers, and practitioners who share the vision to join us, learn alongside us, and to share their insights about how we could achieve not only Wave 2 but more of Wave 3.

We encourage readers to follow SEERNet on social media (@SEERNet_org) and to sign up for our interest list. We hope that additional researchers, practitioners, and platform developers will join our conversation and explore ways to work with our DLPs or on broader shared aspirations.