



Distributed Collaborative Research Model: Meaningful and Responsive Inquiry in Technology and Teacher Education

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Abstract

Researchers in technology and teacher education have been charged with designing inquiry methods that speak broadly about the impact of technology in the preparation of teachers, beyond what is possible through the use of localized case studies and small-scale investigations alone. The Distributed Collaborative Research Model (DCRM) is proposed as a way to develop a collaborative inquiry process for conducting research across multiple teacher education institutions, allowing researchers to access larger populations by capitalizing on known contacts in our professional technology in teacher education community. This paper explores lessons learned from past distant collaborations, details the present development of DCRM, and invites colleagues in technology and teacher education to collaborate to demonstrate sound educational research in our field. (Keywords: research, collaboration, platinum standard)

Introduction

Researchers in the field of technology and teacher education have been charged with designing inquiry methods that allow us to speak broadly about the impact of technology in the preparation of teachers, beyond what is possible through the use of localized case studies and small-scale investigations alone. The seemingly elusive goal of educational technology research is the evidence-based demonstration of the effectiveness of educational technology on student learning; compounding this challenge by shifting the perspective back a step to examine student learning through the filter of teacher knowledge and skill, and then back once again to look through a filter of teacher preparation, has proven a puzzle indeed.

To this already uncertain research landscape was thrust the “Gold Standard” research requirement, characterized by research that demonstrates rigorous evidence of improvement with controlled and randomized methods (Coalition for Evidence-Based Policy, 2003). The enactment of the No Child Left Behind (NCLB) Act of 2001 hinged early 21st century educational funding requirements on research that could meet these scientifically based requirements. Unfortunately, children and teachers are not chemicals that act predictably every time a recipe is mixed. In fact, the very nature of randomization—that some receive treatment and others do not—makes experimental research a largely impractical model for school settings. It is difficult to justify denial of a potentially beneficial educational intervention—especially something as engaging as a technology-enhanced teaching strategy—for some students only. Separating children into groups other than intact classrooms presents an organizational challenge, and ensuring that different teachers in different settings with different children will produce equivalent contexts other than the treatment parameters makes controlling for other variables nearly impossible.

Further muddying the waters is the common research convention that dictates that the only way to effectively compare disparate data in a

rigorous fashion is to quantify it. Many educational researchers believe that analyzing only quantifiable data would mean sacrificing rich, localized, qualitative case data. Interestingly, and in striking contrast to the education-political climate of the early 21st century, the rise of qualitative methods was attributed by some as a direct response to a perceived gap in validity in quantitative measures of student performance (Herriot & Firestone, 1983). In fact, early collaborative efforts actually originated in the 1970s due to pressure from the federal government to create such collaborations that would “overcome some of the weaknesses of large quantitative evaluations without being limited by the particularism of the single-site case study” (p. 14). The thought was that quantitative designs in the form of standardized tests prevented the ability to demonstrate positive academic gains for minority students. Instead, ethnographic methods that focused on the complex interrelation of contextual factors were thought to best document program effects (Guba & Lincoln, 1989).

During the late 1990s and early 2000s, the federally funded Preparing Tomorrow’s Teachers to Use Technology (PT3) initiative sought to develop collaborative efforts between and among the nation’s teacher education programs and the larger educational community. Considering the millions of dollars awarded to colleges of education through the PT3 funding, very little research on the findings of these initiatives has been published (Mims, Polly, Shepherd, & Inan, 2006). In fact, the initiative was implemented before the push for scientifically valid results and was instead intended as a practical, rather than theoretical, approach to improving teacher preparation practice (Rockman, 2004). In August 2001, the Electronic Learning Community (ELC) was developed at Johns Hopkins University to “serve a dissemination function, to share the wealth of research, program designs, evaluation findings, resources, and tools that are strengthening preservice teacher education through PT3 funds” (Simard & Lowry, 2002).

The few studies that have examined findings across PT3 projects have shown some commonalities in implications for teacher preparation institutions. For example, faculty must be aware of technologies before they can use them, and must use them before they can integrate them into teaching. Comprehensive professional development is required to bring faculty to the level of understanding that will allow them to use technology to prompt large curricular shifts (Mims, Polly, Shepherd, & Inan, 2006). With support, faculty are able to modify their use of technology and instructional practice, reconceptualize course design, and come to new understandings of what technology knowledge and skills are needed by novice teachers (Rockman, 2004). However, although PT3-funded projects brought to light some of the many elements that contribute to constructing effective teacher preparation programs, as well as the barriers and limitations, there was “no silver bullet to offer those interested in replicating successful programs” (Rockman, 2004, p. iv.). And, further, had the evaluation been approached in a narrow, scientifically based approach, many of the important questions might have remained unanswered.

As a response to this entire research conundrum—methodological idealism versus classroom reality—the editors of educational technology journals provided a signpost to researchers in our field by collaboratively endorsing a “platinum standard” of research, as follows: “The platinum standard requires rigorous research in authentic school settings that approaches idealized designs as nearly as possible given the constraints of schools and real-world learning environments” (Schrum et al., 2005, p. 204). These editors recommended that research based on authentic classroom settings be undertaken as long as it is grounded in theory and builds upon the existing knowledge base. They suggested three areas for further research in the field: (a) teacher beliefs about technology, (b) teacher use of technology, and (c) student learning outcomes.

So, to summarize the state of research in the field of technology in teacher education in the middle of the first decade of the 21st century: Research in real classrooms was messy, research that attempted to isolate the effectiveness of particular educational technology tools used in real classrooms was messier, and research aimed at understanding the effectiveness of the preparation of teachers to use those particular educational technology tools in real classrooms was often so untidy and removed from the end result of student achievement that it was typically avoided completely. Thus emerged our field’s overreliance on “clean” surveys of teacher attitudes and self-report of technology use.

The Genesis of a Research Response

At the 2006 National Educational Computing Conference (NECC), a handful of members of the Special Interest Group for Teacher Educators (SIGTE) reflected on new discoveries and understandings gained from the conference. We spoke about the desire to make a difference with our research in educational technology in order to better understand teaching and learning with modern tools, as proposed by members of the National Technology Leadership Coalition (NTLC) in the form of a the new proactive research agenda (Bull, Knezek, Roblyer, Schrum, & Thompson, 2005). However, we lamented the fact that it seemed nearly impossible to respond to the demands for rigorous research through small-scale, localized studies. We speculated that one way to mitigate constraints of authentic classrooms would be to design studies with sufficiently robust numbers of participants, achieved by pooling our efforts through collaborative research including both quantitative and qualitative studies.

An idea began to form about joining our collective research forces and pooling our populations to approach the capacity required to meet these research benchmarks. Thus, the Distributed Collaborative Research Model (DCRM) was proposed as a way to develop a collaborative inquiry process for conducting research across multiple teacher education institutions, allowing researchers to access larger research populations by capitalizing on known contacts in our professional technology in teacher education community. If conceived effectively, DCRM might provide an arena for satisfying and meaningful research that also meets present funding stipulations.

In this paper, we first explore what others across academic disciplines have shared about previous collaborative and distant research efforts. We then detail our development process with the intent of beginning a discussion in our field of how such a Distributed Collaborative Research Model might contribute to meaningful research activity and understanding. Finally, we suggest next steps as a way of inviting our colleagues to join the discussion.

The Beginnings of Distant Academic Collaboration

Distributed, collaborative research is a subset of a larger body of online-facilitated scholarly work, which also includes such activities as utilizing online databases and collaboratively writing online journals. The collaborative nature of the Internet, pushed to new and exciting depths by the

easy access options afforded by Web 2.0 tools, make it an obvious area for scholarly exploration across disciplines.

Early models of multisite collaborative research began emerging in the 1970s and 1980s. Foote (1999) offers three early categories of collaborations in the geography academic field; however, his emphasis rests largely with publishing and teaching contexts. First is centralized publishing using common guidelines and format, which mimics joint scholarly collaborations of a conventional type, such as edited paper-based handbooks. Second is distributed publishing using common interfaces and protocols, which is described as being used primarily by digital library collection efforts and includes the development of common protocols for indexing and cataloging materials. Finally, informal and formal collaborations are comprised of natural collaborations that create common instructional materials. These categories begin to help classify the nature of collaborations, although they do not provide an obvious template for conducting collaborative research.

Herriott and Firestone (1983) surveyed a series of researchers who participated in early policy-related qualitative studies, and they describe a movement to strengthen the ability of researchers utilizing qualitative methods to generalize results while still preserving the ability to provide rich, in-depth description. Gould (2005) analyzed 502 research studies in 33 journals on the nature of online communications examining theories and methods over the decade 1993–2003. He found that quantitative research increased over qualitative research after 2000 and concluded this might be attributed to the ease of conducting surveys and other number-based data-collection strategies online.

With the advent of collaborative tools on the Internet came new opportunities for joint distributed research. In the field of science, new communication technologies allowed globally separated experts to easily share scientific knowledge as well as to take advantage of a wider range of funding opportunities (Cummings & Kiesler, 2007; Wang et al., 2005).

The 2008 Horizon Report projected that the adoption of online collaborative tools for teaching and learning will hit critical mass in less than one year. Intuitive tools are available to facilitate collaboration like videoconferencing for virtual communication, shared workstations for joint authoring, social networking tools, and wikis. As faculty and teachers begin to collaborate with colleagues across time zones as a ubiquitous part of their professional interactions, it is only natural that this can translate into distributive research among educators.

The small yet relatively long-running tradition of distant academic collaborative work has balanced the benefits of collaboration with considerable and real challenges, and indicates a set of guidelines to frame future joint ventures, including establishing common methods schemes and encouraging faculty participation.

Benefits Derived from Collaborative Research

The bestselling business book *Wikinomics* has heightened the perceived need for collaboration as a competitive advantage for all types of organizations, including education (Tapscott & Williams, 2006). Online research has been proven to be a feasible and rewarding way for researchers to collaborate (Jefferies & Grodzinsky, 2007). Taking advantage of teleconferencing, chat sessions, and e-mail to conduct online discourse analysis allows group members to be more focused during online communication than during face-to-face meetings (Winograd & Milton, 2000). Multi-institutional science researchers benefited from shared resources, collective expertise, and additional funding available for collaborations across universities (Cummings & Keisler, 2007). Variables that made collaboration especially successful included extensive planning (in person); informal authority by the funding agencies; a flexible budget; horizontal,

democratic management style; and frequent and personal communication (Corley et al., 2006).

Factors that Challenge Collaborative Research

Those who have published about academic research collaborations have been clear that the path to partnered success is not an easy one. Multi-institutional science research projects were shown to be not as cost effective as those completed at single locations (Cummings & Keisler, 2007), with increased costs attributed to differences in structure, pay scales, publishing priorities, as well as the slowing effect of global distance on joint decision-making processes. Further, the greater the number of universities involved, the less “division of responsibilities and knowledge transfer activities” (p. 40) there is, leading to fewer project outcomes. Challenges to collaborative success also can stem from a lack of epistemic and organizational evolution of the research group, shown by limited collective planning or participant familiarity with one another (Corley et al., 2006).

Therefore, the dilemma facing researchers interested in using a DCRM is how to maximize the benefits and counteract the challenges. The history of collaborative projects suggests two main recommendations.

Recommendation: Establish Common Methods

The challenge of any partnership is submitting to compromise in order to make the relationship work. Individual studies provide great description on a small scale, whereas studies of larger populations allow results that can be generalized for the purposes of broad understanding. The dichotomous requirements of balancing the two—specific description with generalizability—can create a tension for distant collaborative research. The balancing act might be mitigated by four design issues (Herriott & Firestone, 1983):

- All research parties must agree on structured collection methods yet not let that structure obscure unique aspects of local sites.
- Generalizability is enhanced by multiple sites, yet the greater the number of sites, the farther any given budget must stretch.
- Long-term immersion at a site increases validity, yet increasing time at any one site limits resources for others sites.
- It is vital to blend both site-specific reporting and cross-site, issue-specific reporting.
- Practical local issues will constantly challenge the process of generalization, demanding a constantly shifting balance of attention to local and generalized perspectives.

Corely, Boardman, and Bozeman (2006) examined interinstitutional, multidiscipline collaborations funded by U.S. science and technology agencies. Through case study analysis among two collaborative groups involving hundreds of researchers at dozens of universities, they developed a framework that indicates that the success of these collaborations depends on the consistency of two considerations:

- the epistemic norms within the disciplines represented in the collaboration
- the organizational structure of the collaboration (p. 976)

Epistemic norms refer to the way in which a group of researchers work within their social setting and includes the accepted routines of research methods within a discipline. The organizational structure is the work culture among the research collaborators. Corley et al. found that, for a research collaboration to be successful, there needs to be a high level of development in one of these two dependencies.

Whitt and Kuh (1991) concur that structuring processes for research team formation, participant selection, data collection, and data analysis are vital. They decided at the outset of their multi-institutional project that, due to the large amount of data and the need to analyze data within the individual sites and across sites, common summary and coding schemes would be necessary. In addition, they recommend concurrent data collection and analysis across sites so that existing data can inform further data collection and interpretation. They conclude that multisite qualitative research is time consuming and expensive, and patience, commitment, and good negotiating skills on all parts are critical. Certainly this advice is appropriate for any distant collaborations in the field of technology and teacher education.

Recommendation: Encourage Faculty Participation

Once mutually acceptable research parameters are in place, the next step in the development of a strong collaborative research partnership is encouraging the participation of individual faculty members, each bringing to the project distinct research agendas, needs, strengths, and dedication to the project's completion.

Key to convincing faculty to participate in collaborative research projects is understanding that they must at times take a leap of faith that they will be rewarded for with promotion and tenure for their role in this research. It can be difficult to recruit authors for online publications due to the comparably low number of peer-reviewed journals and the lack of—or, at best, mixed—merit considerations for digital publication activities (Foote, 1999). The seemingly unstoppable sprouting of greater numbers of online journals and other publications will surely force academic institutions to confront the issue of rating print and online publications equally in the promotion process. A larger job may instead be to assist potential collaborators in reframing a particular collaborative research effort that does not obviously fit into an individual's own research agenda so that it can demonstrate relevance.

Evaluating individual contributions to collaborative endeavors and allocating credit fairly among partners while balancing intellectual property to an acceptable level are difficult challenges that frequently plague writing partnerships (Austin & Baldwin, 1992). Most professional societies and higher education institutions do not have set policies for resolving disputes that can result from teamwork, so agreements are typically handled at the individual author level. As collaboration becomes more standard in the academic profession, clear policies are needed to ensure that faculty derive the maximum benefit from working together (Austin & Baldwin, 1992).

Finally, faculty may need to invest significant time to learn new technologies required to collaborate, (Ajjan & Hartshorne, 2008; Foote, 1999; Greenhow, 2007) such as the use of the ever evolving set of Web 2.0 tools. In many cases, faculty may need assistance to see how these modern tools are not simply fancy alternatives to accepted communication tools like e-mail. Instead, the novel capabilities these tools offer to organize information and allow groups to edit documents have significant implications for new strategies in collaborative authoring. Given the realistic time investments that might be required to effectively make use of such tools, attention should be devoted from the outset to specifying the types of collaboration and communication the group desires, identifying what tools match these needs, and exploring how skills might be developed.

How DCRM Could Meet Our Research Needs

On the surface, a collaborative research effort such as DCRM would meet the “platinum standard” recommendations if research questions were asked that aim at understanding how the integration of educational

technology in schools could facilitate learning. The ability to generalize from the findings would be enhanced by the compilation of a large database with studies obtained from a variety of sites. Each study would need to have a strong theoretical base and would add to the knowledge base by expanding the depth of insight that has been generated by a quantitative study.

But, as we began to explore the boundaries of what DCRM relationships could mean for research in technology and teacher education, we speculated that the collaborative nature of DCRM, as well as the characteristics that would be required for its success, had the potential to embed the capacity for rigorous and valid practice, which is specified by the call for “platinum standard” designs, into the research design from the outset. For example, research partners could serve as co-mentors and co-auditors to check methods throughout the process, constantly challenging the collaboration to ask the right questions, align the proper methods, ensure the controls that were possible given the contextual parameters, and push analysis to meaningful and empirically supported levels.

The literature has also recommended the need for consistent methods to make interinstitutional collaborations successful. Not only will consistency smooth long-distance partnerships, but it will also build in factors aimed at increasing reliability. In a sense, this type of planned collaboration would allow for essentially simultaneous study replication.

Finally, researchers acting alone are at too much risk of distraction from other projects, teaching and service obligations, and countless personal circumstances that can steer them off course. The temptation to allow a study to wither after obtaining an initial set of data is great! Working together with peer scholars could enable the persistence needed—the nagging voice over one’s shoulder—to seek the longitudinal data necessary to answer the challenge of the new research agenda. Perhaps that is why federal grant proposals commonly require evidence of real partnerships. The opportunity for revisiting the data with additional inquiries is enhanced by collecting more extensive data.

Of course, these same characteristics can easily lead to trouble, as previous distant collaborators have warned: Partners can get sloppy about the tedious checks of each other’s work; collaborators can bypass consistent methods for localized “quick-fixes” in the face of a practical implementation deadline; and peers can take on just too many projects to maintain long-term plans and contacts.

Developing a Collaborative Research Team

This body of literature suggests that entering into a collaborative research project of this potential size and scope requires a network of interested and committed co-collaborators. In 2006, the SIGTE leadership saw the potential in the DCRM Project and agreed to sponsor a NECC conference session on its development. One of the authors, serving as research team leader, began the process of drafting such a team with an e-mail to the SIGTE listserv in January 2007. In that e-mail, she described the need for and general scope of the project, and then introduced a three-tiered participation structure so that respondents could gauge the time they were willing to invest:

- **Core research design team member.** This small core group would brainstorm initial research topics, methods, epistemic agreement and methodological concerns, instruments, and other logistical considerations.
- **Research site lead.** Once the project was designed, members of this next layer would be needed to implement a pilot study at various collaborative sites according to the central plan.

- **Next layer of implementation.** This third option was listed to solicit interested parties who may not want or be able to get involved at that time but who might join the project for a second iteration of implementation.

We received a total of 39 positive responses to that initial e-mail; 11 indicated an interest to participate in the core design team.

Working Together When Apart

The technical options for conducting a DCRM project were promising and plentiful due to powerful and freely available Web 2.0 tools. Although our core design team began its communication in the familiar e-mail format, we soon transferred our work to a wiki, as we felt this tool best capitalized on the collaborative nature of the project. (See our project space at <http://distr-collab-teacher-ed-research.wikispaces.com>.) Innovation diffusion theory research has consistently found that technical compatibility, technical complexity, and relative advantage (perceived need) are important antecedents to the adoption of innovations (Bradford & Florin, 2003; Crum et. al., 1996). Members of our project—most of whom had not previously used a wiki—found themselves in the role of early adopters of the technology for scholarly purposes, getting up to speed rather quickly so that they could easily view, edit, and add pages and content.

To facilitate our process, the research team leader “seeded” the project wiki with “starter” documents that members could use as a starting point for their participation (e.g., research design, timeline, funding, ground rules). Our core design team seemed to find the best success when adding to lists of items rather than starting with blank pages, and seemed largely uncomfortable with changing others’ text. Because many of the participants did not know each other before working on this project, they may have been somewhat reluctant to fully engage. Being able to see a record of our progress tracked automatically and highlighting changes to previous saved versions gave some members the confidence to make edits to pages. Unexpectedly, the Discussion feature of our wiki tool was used the most, perhaps because it looked the most like electronic tools that members had used before.

In the end, as collaborative and well suited as the wiki tool was to our work, it proved less spontaneous than we would have liked. It seemed that the extra step it took to log in to the wiki account to see new development activity was prohibitive to productive work. Conversation in later months regressed back to e-mail, and as it did, it actually seemed to pull other interested members in along the way. One interested collaborator mentioned that the wiki environment made it seem “difficult to break in” to the collaborative work. Clearly such exclusivity—perceived or not—could be a benefit or a detriment, depending on the nature or stage of the collaboration. It likely makes sense, then, for future DCRM projects to select a communication tool that leads to the most productive and meaningful work for any particular group at any particular stage of work.

Collaborative Design Process

Just as any research study begins, our core design team needed to first identify a research topic and related questions. Our considerations were complicated, though, by the prospect of conducting research at multiple sites, with multiple participants, agendas, needs, etc., as well as by the desire to not only conduct successful research but also to test and validate DCRM as a research approach. Before we could turn to questions of inquiry, we needed to first decide whether to attempt to conduct one common study at multiple venues or to begin immediately with multiple studies.

We managed this discussion by posting to the wiki a “pros and cons” list for each option and asking core design team members to add to each list. Over the course of approximately one month, we debated how starting with one common study would:

- allow us to focus on understanding what the model might help us accomplish across multiple institutions
- allow us to do the kind of significant research that is hard to pull off in small-scale studies
- help us develop a common understanding and theoretical framework so that we are all talking the same language
- potentially provide for deeper methodological debate about the most appropriate way to answer the single question (<http://distrcollab-teacher-ed-research.wikispaces.com/topics-questions>)
- We weighed those “pros” with the downside of a one-study start, which, in short, argued that:
- some who would like to participate might not be as interested in a generic topic
- a single question may not cover the range and diversity of contexts in which we work
- everyone who participates may not benefit in terms of scholarly productivity

In the end, we came to the consensus that, although one common study might initially limit direct individual scholarly applicability, the simpler structure would allow us to test the model in the most expedient manner while still allowing individual benefit to be teased out. Perhaps one restriction on the development of a research study was that the collaborators were initially attracted to the project to explore the potential of DCRM rather than a specific research topic. Ironically, it might be easier to demonstrate the effectiveness of DCRM when a group of researchers identify a common research question and simply implement the model, reversing the process that this group used. The chief contribution of this study turned out to be establishing ground rules for the implementation of DCRM.

Establishing Ground Rules

The clear message we took from the literature was that collaborating across a distance for research and writing purposes is challenging in countless ways, and that the best way to aim toward a successful venture is to collaboratively establish a structured process to which all research members agree, for all aspects of communication; data collection, analysis, and management; ethical considerations; and aggregated versus disaggregated use of data. Therefore, at the same time we designed the pilot research project, we drafted an initial list of common protocols to which anyone interested in participating in a DCRM project would need to agree. It is expected that any collaborative group would devise a way for all members to commit to these agreements, likely in writing or by electronic signature.

The first operational facet of a collaborative project upon which any group would need agreement was the fair and balanced contribution of resources to the good of the project. Resources in this respect might center around graduate assistant or other personnel time for data collection, transcription, analysis, writing, and other data management activities. It would be expected that if one institution’s resources were weighted in one area, other partners would make up the difference in other areas.

Next, members would need to develop a communication plan, including when, how often, with what tools, and for what purposes communication would take place. A progress timeline with clear action items and points for communication would be vital in organizing the communication.

Before too much time elapsed, members should have a conversation about ethical considerations, along with the concomitant plan for joint application for institutional review board (IRB) approval at any participating institutions. The very prospect of juggling multiple and simultaneous IRB proposals may be enough to stop the DCRM model from progressing further! However, delineating such a necessity from the outset should help collaborators plan to write all common elements collaboratively to reduce the burdens on the individuals.

Next, collaborators would need to agree on a plan for access to data. Presumably, participant researchers would offer their local data so that it could be compiled with the larger corpus of data, and together the group would be able to answer those larger national and global questions. However, that should not preclude an individual member or institution from pulling out their own local data to be used to better answer local questions. Presumably, common coding schemes—for both quantitative and qualitative data—would allow for aggregation and disaggregation of data for flexible purposes. Because the data set would be collaboratively generated, it makes sense for everyone who contributed to have equal—or at least agreed upon—access to the data.

A fifth recommendation would be for any collaborative group to establish a clear authorship agreement. Such arrangements are common practice for frequent co-authors but should specifically identify a plan for either rotating first authorship, publishing as a “group” entity, or following some other mutually agreed-upon plan. Developing a list of common descriptors of all participating programs would allow each publication to be introduced to the members.

Plans for a Pilot Study

With the decision to launch a single study and considerations for fair collaborative participation behind us, we next embarked on identifying a common research question to tackle. As with other decisions, we used our wiki as a platform for vetting potential research topics. Preferences for research very quickly settled around measuring the technology skills, proficiency, and preparedness of recent teacher education graduates, a topic that appealed to the research interests of most who voiced their thoughts.

Discussion shifted to what would need to happen logistically to carry out a pilot study. Questions related to these practical and crucially important details abounded. How might we:

- specify common research questions?
- identify relevant theory?
- develop a common method?
- draft a research timeline?
- identify or design instruments for collecting data?
- apply for IRB permission at each research site?
- compile data collected from various locations according to a common scheme?
- return compiled data back to research leads for analysis?
- explore other Web 2.0 tools that might offer intriguing and useful options for communication and collaborative writing?

This list is lengthy yet likely incomplete in terms of defining the depth of collaboration that would be required to carry off successful distributed collaborative research.

In early 2009, we collected initial data from the first study to be formally designed and implemented following the DCRM model and intentions (Cunningham, Bennett, Friedman, & Pierson, in press). Two technology-enhanced teacher preparation programs that had both received PT3 funding designed a survey instrument to assess novice teachers' perceptions of their own preparedness to teach with technology. Researchers collaborated together across institutions to establish common research questions, survey items, population parameters, and implementation timelines. We distributed an online survey to recent teacher education graduates with three years of teaching experience but who graduated since the PT3 funding, so the graduating classes of 2002–2006. Although data had not yet been analyzed by the press time for the present article, the DCRM process itself played out in expected ways.

The researchers had access to this list of logistical and design considerations and ground rules and were able to use it as a structure to guide implementation. For example, common data collection schemes were agreed upon, and one researcher agreed to administer the survey using an online survey tool. The faculty who participated included junior faculty who were balancing their own research agendas with the goals of the collaborative project. It is expected that there are data that can be used in a variety of ways, both for institution-specific study as well as for cross-institution comparisons. As data are analyzed, the list of logistical considerations can be used to guide a systematic analysis of the process.

Next Steps: An Invitation to Collaborate

The 2007 New Media Consortium's Horizon Report listed "new scholarship and emerging forms of publication" as trends on the horizon for the next four to five years. The 2008 Horizon Report continues the conversation:

As the gap grows between new scholarship and old, leadership and innovation are needed at all levels of the academy—from students to faculty to staff and administrative leadership. It is critical that the academic community as a whole embraces the potential of technologies and practices . . . Experimentation must be encouraged and supported by policy; in order for that to happen, scholars, researchers, and teachers must demonstrate its value by taking advantage of opportunities for collaboration and interdisciplinary work (p.5).

Clearly there is a call for the type of collaborative research that could be accomplished by the DCRM. The convergence of the need for large-scale data with the understanding of the value of real collaboration as well as the availability of modern technology tools ideal for collaboration across distances presents an opportunity that is hard to pass up.

However, it should be noted that, as evidenced by the rather obvious absence of any research findings in this paper, many of the suggestions given remain formally untried; thus, the DCRM as an approach to research that could benefit the understanding of technology in teacher education remains, in essence, theoretical. We add our voice to the advice from collaborative studies that came before ours: Collaboration for academic purposes is difficult.

For the authors and others involved in the visioning stages of this project, after a well-received presentation at NECC 2007, when the task of determining real ways to move forward required real action, more pressing work, individually focused research, and myriad other academic responsibilities pushed this project aside. The need for maintained energy for the collaborative research project became evident. Yet the promise of the understanding that could come from collaborative research efforts is so enticing that the model deserves offering to others in our community for their consideration. And, indeed, members of our SIGTE community are involved with various levels and stages of collaborative work that we anticipate will bear exciting results in the coming years.

Certainly newly emerging collaborative tools (e.g., Google Docs, Adobe Buzzword, Microsoft Office Live, wikis, and nings) continue to lessen both technical compatibility and technical complexity of users operating on different computer platforms and skill levels. Scholarly Web sites like My Net Research further simplify the process by acting as something of a matchmaker of researchers, connecting those who want to work together and offering a built-in range of online tools to communicate with fellow scholars, manage project aspects, and analyze data (see <http://www.mynetresearch.com>).

The timing for distributed collaborative research is ideal. This lull in the progression of the DCRM—perhaps the reaching of a plateau—presents an ideal opportunity for enticing others into the process. So, as a conclusion, we invite our colleagues in technology and teacher education to think, inquire, communicate, and otherwise get involved with working together for the common good. Such scholarly collaborations will not only advance our understanding of best practice in technology use for teacher candidates—and, arguably, affect a generation of new teachers—but, with such intentionally designed studies, provide data that can be tailored to meet a wide variety of individual research agendas and tenure ambitions. Certainly, studies employing varying levels of collaboration with the recommendations for common methods and faculty participation are already ongoing in the field of technology and teacher education. We invite those researchers to widely share their findings, as well as their practices, so that the DCRM can continue to be refined to strengthen our research field.

The groundwork is laid and a structure exists. Now, how might we collaborate to demonstrate sound educational research for the better understanding of the use of technology in teacher education in ways that might even influence the larger field of educational research?

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Pierson documents the lessons learned from past collaborations and details a model for collaborative research. In keeping with the international scope of ISTE, authors Ahmet Naci Çoklar and Hatice Ferhan Odabaşı's article, "Educational Technology Standards Scale (ETSS): A Study of Reliability and Validity on Turkish Preservice Teachers," presents the development of a scale that determines how effectively teachers in Turkey are using the NETS•T. Although the scale was based on the NETS•T 2000, the rigor of their methodology warrants dissemination. And finally, in the article titled "Construct Validity for Teachers' Attitudes Toward Computers Questionnaire," Rhonda Christensen and Gerald Knezek present a well-validated and reliable instrument for teachers' self-appraisal of their attitudes toward computers. Combined, these articles strengthen our knowledge base and offer multiple methods and perspectives to improve the integration of technology into teacher education.