

Developing an Open Social Scholarship Collaboration: Lessons from INKE

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Article abstract

Many academic teams and granting agencies undergo a process of reflection at the completion of research projects to understand lessons learned and develop best practice guidelines. Generally completed at the project's end, these reviews focus on the actual research work accomplished with little discussion of the work relationships and process involved. As a result, some hard-earned lessons are forgotten or minimized through the passage of time. Additional learning about the nature of collaboration may be gained if this type of reflection occurs during the project's life. Building on earlier examinations of INKE, this paper contributes to that discussion with an exploration of seventh and final year of a large-scale research project.

Implementing New Knowledge Environment (INKE) serves as a case study for this research. Members of the administrative team, researchers, postdoctoral fellows, graduate research assistants, and others are asked about their experiences collaborating within INKE on an annual basis in order to understand the nature of collaboration and ways that it may change over the life of a long-term grant. Interviewees continue to outline benefits for collaboration within INKE while admitting that there continue to be challenges. They also outline several lessons learned which will be applied to the next project.



METHOD

Developing an Open Social Scholarship Collaboration: Lessons from INKE

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Many academic teams and granting agencies undergo a process of reflection at the completion of research projects to understand lessons learned and develop best practice guidelines. Generally completed at the project's end, these reviews focus on the actual research work accomplished with little discussion of the work relationships and process involved. As a result, some hard-earned lessons are forgotten or minimized through the passage of time. Additional learning about the nature of collaboration may be gained if this type of reflection occurs during the project's life. Building on earlier examinations of INKE, this paper contributes to that discussion with an exploration of seventh and final year of a large-scale research project.

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Keywords: collaboration; project management; INKE

Introduction

Collaboration and research teams have been in use in the sciences for a long time (Hagstrom 1964; Jeong and Choi 2014; Olson and Olson 2013; Katz and Martin 1997; Quan-Haase, Suarez & Brown 2014). However, in recent years, these ways of working are surfacing within the humanities as projects become more complex and larger in scale, generally beyond the scope of a single researcher. In addition, these projects often require different perspectives from various disciplines, again requiring a team approach (O'Connor et al. 2003; He and Jeng 2016; van Rijnsoever and Hessels 2011; Siemens and Burr 2013). These trends are reflected through the number and increase in co-author publications and multi-investigator grants (Schleyer et al. 2012; Kraut, Galegher and Egidio 1987). Further, funding agencies are encouraging this work through programs geared to large-scale projects and ones that require multiple disciplines (Office of Digital Humanities 2010; SSHRC 2013; Katz and Martin 1997; Bammer 2008; Jeffrey 2003).

While researchers and other associated team members welcome these collaborations as a way to undertake larger-scale projects (Siemens and Burr 2013; Siemens et al. 2011), work still needs to be done to prepare individuals for working within a team where interdependent tasks must be coordinated, knowledge and progress must be communicated, and an overall research vision must be accepted and enacted (Newell and Swan 2000; Hara et al. 2003; Lawrence 2006). However, little is well understood about the ways to do this, the good practices needed for successful outcomes as well as the characteristics of people who can work well within a team project (Jeffrey 2003). Often research teams assume that ways to collaborate are well understood among the team; this may not be the case (Katz and Martin 1997). While some might look to the private sector for guidance, it cannot provide many useful models since the academy and it are quite different (Jeong and Choi 2014; van Rijnsoever and Hessels 2011).

Few mechanisms exist on how best to undertake this type of collaborative research (O'Connor et al. 2003; Jeffrey 2003; Melin 2000). As highlighted above, some areas of collaboration are not well understood. As a result, many people learn to work in groups through trial and error, which is often an inefficient way to do so (Bammer 2008). To this end, some teams conduct a post-mortem exercise to understand lessons learned about collaboration and develop best practices for other team-based projects (e.g., see Bracken and Oughton 2006; Bryan et al. 2002; Kishchuk 2005; Trnka 2008; Williford and Henry 2012; Dombrowski 2013; Yu, Lau & Lee 2012). Others undertake independent studies of projects both during and at the conclusion of research (Cummings and Kiesler 2005; Lawrence 2006; Pennington 2011; O'Connor et al. 2003; Bammer 2008; Jeffrey 2003; Blythe and Croft 2010).

While useful, reflection at a project's end may mean that some lessons are minimized or forgotten (Jeffrey 2003). Consequently, there is much to be learned by examining a collaboration in progress and gaining knowledge about the best ways to manage teams (O'Connor et al. 2003). Beyond supporting teams themselves, this knowledge becomes helpful for policy makers, funding agencies, and institutions as they look to develop new funding programs (van Rijnsoever and Hessels 2011). As part of a larger study that focuses on the lived experiences within a long-term project, Implementing New Knowledge Environments (INKE), this paper contributes to this discussion with a focus on an exploration of a mature and effective collaboration as it nears completion. It also builds upon earlier reflections (Siemens and INKE Research Group 2012c, b, 2010b, a, 2013, 2014, 2015, 2016, 2012a). This study provides guidance to other academic collaborative projects.

Context

A starting point to understanding best practices within academic teams is to clearly define the term 'collaboration.' By developing a common definition, all involved can understand it in the same manner (Katz and Martin 1997). This end goal is complicated because there are a multitude of definitions and a range of activities within collaboration. For some, at a basic level, collaboration involves advice seeking while others see it as direct participation in a project where involvement is substantial and significant (Katz and Martin 1997).

He and Jeng (2016) suggest that 'academic collaboration is a relationship among scholars' (57). They further suggest that there are different stages of collaboration that range from the conceptualization of a research project, to its design, execution, and finally the dissemination of results. Van Rijnsoever and Hessels (2011) echo this with a definition that focuses on relationships between scholars who intend to create new knowledge from within and across disciplines. Thus, collaboration occurs when people with diverse interests come together with a common purpose and the desire to share information and achieve outcomes (Amabile et al. 2001; Cummings and Kiesler 2007). At a skill level, a person works with another because they have 'perspective[s], skills, resources or some other attribute that contributes something relevant to address the research problem' (Bammer 2008, 867). This is echoed by Melin (2000), who states that individuals work together because they need something from someone else. As can be seen across these definitions, it is people, not institutions, who work together and build relationships (Katz and Martin 1997). Ultimately, success in this context is the ability for a team to reach its goals with a supporting process (Bammer 2008).

This may be easier said than done. Several key factors need to be in place for success. First, team members must have the necessary skills, which include written and verbal communication, among others (Jeffrey 2003). Further, a clear division of labour must be established (Melin 2000) along with agreements around the use of data, funding allocations, authorship, and outputs/outcomes (Bammer 2008). These are complemented by the fact that collaborators must learn to share with and respect each other while seeing the benefits of the differences and similarities between them (Melin 2000).

While there are challenges, as outlined below, many benefits to collaboration exist. At a basic level, academic team research allows involved individuals to produce higher quality research and undertake bigger projects than is possible as individuals (Melin 2000; van Rijnsoever and Hessels 2011) especially when combined with the use of new technology and/or new ways of using traditional technology to create new approaches to problem solving (Cummings and Kiesler 2005; Katz and Martin 1997; Garland et al. 2006). At an even more pragmatic level, collaborations allow individuals to author more papers (Melin 2000) providing extrinsic rewards in the form of increased visibility and impact (He and Jeng 2016). At a more intrinsic level, this type of work provides for learning opportunities and leads to new and different ways of thinking and acting with shared information and the transfer of knowledge (Karlsson et al. 2008; Garland et al. 2006; Katz and Martin 1997; Melin 2000). For some, fun and opportunity to be social can be a benefit (Melin 2000; Katz and Martin 1997; van Rijnsoever and Hessels 2011; Siemens et al. 2011).

Of course, challenges exist for collaborations. First, little incentive, by traditional measures, to collaborate exists because this type of work requires people to work in cooperation which is complicated by individuals'

need for credit for their work (O'Connor et al. 2003). Second, collaboration requires teams to develop a shared understanding of the research, while often working across a variety of disciplines, hierarchies, differences in status, and across distances and institutions. This is not an easy task (Garland et al. 2006; Massey et al. 2006; Katz and Martin 1997). However, this challenge can be mitigated when teams develop common understandings of the research question, encourage teamwork, and manage the assignment of academic credit (O'Connor et al. 2003; Massey et al. 2006). As can be appreciated, this becomes labour-intensive as teams work to coordinate tasks and people, often without the benefit of face-to-face meetings (Cummings and Kiesler 2005; Katz and Martin 1997; Schleyer et al. 2012; Kanfer et al. 2000). These challenges can be balanced by the benefits, something that teams must find a way to achieve.

Case Study: Implementing New Knowledge Environments (INKE)

Funded through Canada's Social Sciences and Humanities Research Council's Major Collaborative Research Initiative granting program (Social Sciences and Humanities Research Council 2010), the INKE research project is a seven year, multidisciplinary project with 35 active researchers plus postdoctoral fellows, graduate research assistants (RAs) and partner organizations across four countries and with a budget of approximately \$13 million of cash and in-kind funding (INKE 2012). Spanning seven years, it is focused on studying 'different elements of reading and texts, both digital and printed' and contributing 'to the development of new digital information/knowledge environments' (Siemens, Warwick, et al. 2009, n.p.; Social Sciences and Humanities Research Council 2010, 2009). The primary research objectives focused on understanding ways to bring together the 'traditional strengths of print' with the advantages and 'flexibility' that come with 'digital reading environments' in order to take advantage of all that the new digital environment has to offer (Siemens, Cunningham, et al. 2009, 3).

The research began in 2009 with four research areas – Information Management, Textual Studies, User Experience, and Interface Design. The Textual Studies area examined the elements of traditional print culture that could be brought forward into a digital reading environment while User Experience explored the ways that readers engage with both print and the digital. The Interface Design team examined the impact of interfaces on scholarship and reading within a digital environment. Finally, the Information Management group explored prototype reading interfaces within a digital context to promote active reading with a base of dynamically produced supporting materials. A fifth area focused on understanding and developing a research collaboration strategy to support this work and integrate researchers and partners alike (Siemens, Cunningham, et al. 2009).

After three years of collaboration, INKE divided into two areas with a focus on Modeling and Prototyping (MP) and Interface Design (ID) (For a discussion on reasons for reorganization, see Siemens and INKE Research Group 2012d, a). In the fourth year of funded research, INKE also underwent a mid-term review where it reported on its research outcomes relative to the grant application, initial project planning, and ongoing yearly plans. Beyond reading the report, the review panel interviewed the administrative team, researchers, partners, and past and present graduate research assistants and postdoctoral fellows to understand research outcomes and collaboration and administrative processes. Ultimately, this review determined whether INKE's research funding should continue for the remaining half of the grant. Based on its demonstrated productivity and collaboration, the project was renewed. Now in its final year of funded research, the team is considering future research directions and partnerships with a focus on open social scholarship within Canada (INKE 2014a).

This research collaboration has been successful by traditional academic measures, with over 140 publications including articles, book chapters, and books and over 450 presentations delivered. In addition, 15 working tools and prototypes have been developed, a measure that is often characterized as non-academic. From a human resource perspective, over 53 graduate research assistants, 19 postdoctoral fellows and 4 staff people were involved in the collaboration (INKE 2018).

To support this collaboration and to ensure that the research was achieved, INKE used an annual planning cycle to plan and implement the overarching research objectives. These plans were further supported by mid-year reporting which compared the actual against the planned and provided direction for the rest of the year.

Methodology

On an annual basis, through semi-structured interviews, members of the administrative team, researchers, graduate research assistants, partners, and others were asked about their experiences collaborating within INKE in order to better understand the nature of collaboration and ways that it may change over a long-term

grant's life. The interviews were conducted primarily through skype and in-person sessions. The interview questions focused on understanding the nature of collaboration and its associated advantages and challenges within INKE's context. These interviews allow the researcher to explore topics more fully and deeply, with probing and follow-up questions, while participants reflect on their own experiences and emphasize those issues that are important to them (Siemens and INKE Research Group 2012c, b). This paper focuses on interviews with the administrative team and centers on the project's seventh and final year.

Data analysis involved a grounded theory approach that focused on the themes that emerged from the data. This analysis was broken into several steps. First, the data was organized, read, and coded to determine categories, themes and patterns. These categories were tested for emergent and alternative understandings, both within a single interview and across all interviews. This is an iterative process, involving movement between the data, codes, and concepts, constantly comparing the data to itself and the developing themes (Marshall and Rossman 1999; Rubin and Rubin 1995; McCracken 1988; Newell and Swan 2000).

Findings

Overall, INKE remains a positive experience; though, there is a realization that collaboration is not as easy as saying 'let's collaborate' (AL3).

Definition of Collaboration

After seven years of working together, the interviewees had some thoughts on the nature of collaboration. In their minds, a collaboration is a group of people working together towards common goals and mutual benefits (AL1, AL3). One of the interviewees suggested that there is a difference between 'cooperation,' which focuses on meeting one's own needs while working together, versus 'collaboration,' which concentrates on putting others' interests first (AL4). Echoing this, another interviewee made the distinction between partners and contractors who are paid to do a job (AL3). Partners are often seen as collaborators where contractors are often not.

At one level, the understanding of collaboration has not changed much over the years, but there have been shifts in the pragmatics. One interviewee stated that work needs to be done to ensure that everyone is on the same page, which means explicitly defining and revisiting terms and agreements (AL1). For another, this collaboration led to a shift in paradigm from solo work to working with others, something that becomes easier over time (AL3). The interviewee often found that this way of working together broke down hierarchies, especially among the role of students. These individuals were able to be more involved in the project than is generally the case. Further, collaboration was even extended into the classroom with student group assignments (AL3).

Benefits

The interviewees indicated several layers of benefits to the INKE collaboration, from individual to project-oriented ones.

Several interviewees indicated that the collaboration provided benefits to them at the personal level. For one participant, they were able to directly link their involvement in INKE to their current position at their university. By being part of this grant, they were able to present at several conferences per year, thus grounding their involvement in the digital humanities community within Canada and beyond. INKE also facilitated the flow of money to their university, which provided funding support for students. It also translated to success with their own grant application (AL3). For another interviewee, they found that their participation in INKE fundamentally changed their way of working as a researcher. They moved from a comfort level as a lone researcher to one who feels more at ease with collaboration and now cannot imagine working any other way (AL2).

At a broader scale, team co-leads were fundamental to collaboration within the grant (AL2, AL3). As one interviewee stated, as a co-lead, they were able to learn from and adapt to the other co-lead and find a way to support each other at busy times (AL2). Another interviewee found that the co-lead provided someone to rely on and relieve anxiety (AL3). In terms of other benefits at the project level, a form of accountability was found within the conference cycle with the preparation of abstracts, followed by the conference paper, and finally the presentation itself. This provided structured work for students which was independent of the yearly planning cycles. Through this process, INKE was able to position itself as an international ambassador for research in the area (AL4). For another interviewee, collaboration across multiple institutions made it easier to locate researchers, postdoctoral fellows and research assistants (AL4). In addition, the relationships developed through these actions often led to other projects (AL2).

Finally, at a larger level within INKE, several more benefits were highlighted. First, the collaboration was an opportunity to (re)articulate research goals and work to shape nascent ideas within that context. This, in turn, led to the development, creation, and shaping of an active research community comprised of partners and researchers. The community was further supported through stakeholder engagement at partner meetings and birds-of-a-feather gatherings. In turn, research was accelerated due to partner involvement (AL1). This way of working contrasted traditional academic work cycles where a larger community only interacts with ideas once they are fully formed and published in journals. As a result, this created dialogue space that was invaluable and something that is not easily measured (AL1, AL2, AL3). It must be noted that, as needed within the academy, research was still published which provided benefits at the individual and partner levels (AL2, AL3). Finally, this collaboration also shaped the understanding of research and what its contribution looks like within the larger community. For example, multiple individual projects can then lead to larger research projects, ultimately providing more benefits to the partnership (AL4), something that is not easily supported through the publication of journal articles (AL1) to a limited audience.

Challenges

Of course, no collaboration is without its challenges. INKE is no different; however, the team has found ways to manage and mitigate these. As one interviewee suggested, they would not be involved if significant challenges existed (AL2).

At a micro level, the challenges were focused on several areas. One ongoing challenge has been the timeliness of funds being transferred to institutions (AL2). Another has been with finding, retaining, and managing students (AL2, AL3, AL4). One interviewee found that negative experiences can flow from working with students (AL3). In one case, the interviewee mentioned that they learned ways to manage RAs that included firing one (AL2). Finally, there was a realization that when RAs do not deliver on time, the project itself can be slowed down. As a result, the interviewee structured projects in such a way that a problem in one area did not stall the entire project. In response, the project became more modular in design (AL2). In terms of the retention of students and postdoctoral fellows, interviewees found that some only stayed with the project for a year or two while others were involved for longer periods of time and in different roles (AL3, AL4). Despite these challenges, this situation was often framed as a positive problem. It showed that students were learning valuable skills that could be applied in other contexts (AL1). The last challenge centered on the need to ensure that certain infrastructure was available to facilitate the movement of prototypes to production, an aim of INKE (AL2).

At a broader level, challenges were associated with creating and supporting teams and collaboration over multiple years and distance (AL1). At a basic level, interviewees learned that true collaboration was not easy and a matter of saying 'let's collaborate.' Even after seven years, most projects were structured as 'I will do this part and you do that part', rather than 'let's do this together' (AL3). The two sub-research teams had wanted more interaction between each other, something that never quite materialized (AL3) because both had different momentums (AL2). Further, not everyone felt comfortable working in a collaboration where ideas were often articulated before fully formed and presented to groups—which included partners, not all of whom were academics (AL1). All interviewees commented that this led to challenges around finding ways to integrate partners and stakeholders in the research that could provide positive outcomes (AL1). One interviewee also articulated that it could be difficult to stay engaged over seven years where the potential for waning interest existed. The yearly planning cycles mitigated this by creating cohesion over the years. This cycle also made it easier to focus on tasks year by year (AL3). Finally, as echoed in earlier years, keeping a sense of team across distance can be hard but this was less of an issue this year as INKE wound down one grant and began to gear up for the next potential one (AL3).

In terms of the research itself, the pace of change in the field under study was different than is typically associated with academic research projects. As one example, at the start of the grant, there were no iPads, iPhones, or reading tablets along with social media platforms (AL4) that then became key areas under research consideration. As a result, INKE moved away from a seven-year planning cycle to an annual one (AL1). Due to this change, flexibility was required from researchers, stakeholders and involved institutions (AL1, AL4). Another challenge focused on the ebb and flow of involved individuals over the life of a grant (AL3, AL4). One interviewee commented that seven years is long time to work with the same people and still stay committed to the overall research (AL3). However, it does speak well that those involved still wanted to work on another team together (AL3). Another interviewee commented that too much stability might not have been a good thing because it could lead to some conservatism. Instead, some dynamic change can be beneficial to the project (AL4).

Lessons Learned

When asked about lessons learned from the seven years of INKE, the interviewees had a few thoughts. These lessons tended to flow from the challenges outlined above. First, change is inevitable. This can be healthy and create opportunities (AL1), but requires some adaptability (AL2, AL4). This change was felt at the level of involved individuals, partner engagement, priorities, and institutions. At the same time, project stability was created through the funding agency and then grounded in the grant's research question (AL1). Second, better outcomes were gained through collaboration, in contrast to those possible by a sole researcher (AL2). However, to accomplish this, those involved had to understand the value of the team (AL1). The next potential stage of the research may further change the ways of working together as partners are further integrated into the research (AL3).

As the team looks forward to next steps, it is apparent that there is much that is positive. First, the team wants to keep working together. One major outcome of INKE has been the creation of space for dialogue with the 'right' people at the table, even if they change over time. While useful, this dialogue space cannot be easily quantified, unlike journal articles (AL1). This space also privileges partners over individual scholars (AL2), which leads to further involvement and integration of these stakeholders (AL3). This requires the need to learn new ways to communicate with partners, and each other, within the new potential team (AL4). Exciting opportunities with changes in scholarship can be created (AL2) with outreach to the larger digital humanities community and hopefully beyond to related industries and countries (AL4). Ideally, the new grant will bring 'new blood,' so to speak, into the project with new research assistants and postdoctoral fellows (AL3). Second, the new INKE project on open social scholarship, if successful at securing grant funding, will mean that the project is prepared for change and knows ways to respond within planning structures (AL1). Disruptive factors will be present but annual planning cycles will support the next iteration of research within the context of the overall research question (AL1, AL3).

Things That the Team Members Wished They Had Known at the Outset

The interviewees were asked what they wished they had known at the outset of their involvement in INKE, bringing forth several important insights. For one interviewee, this knowledge focused on their relationship with their research office and its role. Further, this interviewee wished that they had known ways to mentor students and to structure work flows so that issues with one RA did not impact an entire project (AL3).

At the larger level, the interviewees focused on several different issues. For one, they wished that they had known how much technologies would change, some quite dramatically, and the ways that this would impact the team (AL1). This created a need for flexibility and adaptability (AL4). Within this changing environment and the instability that followed, the stabilizing role of the funding agency was required (AL1). For others, they wished they had been aware of the amount of work that is required within a collaboration, knowledge that they are now taking forward to the next team (AL2, AL3). Furthermore, this work resulted in demands at the intellectual level and within the yearly planning cycle (AL2). Within this context, knowing ways to design projects that span multiple years rather than one year would have been useful (AL3). As highlighted by most interviewees as a final wish for knowledge at the outset, it would have been beneficial to have had a greater understanding of the ways to engage and integrate researchers and stakeholders (AL4).

Discussion

While INKE is but one example of a research collaboration and it may be difficult to generalize to other projects (Jeffrey 2003; O'Connor et al. 2003; Pennington 2011), this case study provides insight into ways to best manage this type of interdisciplinary research (O'Connor et al. 2003).

After seven years working together, INKE is a mature collaboration and is successful by several different measures, including the number of journal articles, conference presentations, prototypes, and other outputs (Olson and Olson 2013; van Rijnsvoever and Hessels 2011; Siemens and INKE Research Group 2015; INKE 2018), despite the odds given the riskiness of this type of endeavor (Cummings and Kiesler 2007; Garland et al. 2006; O'Connor et al. 2003). Among these risks are the complications stemming from coordinating work across institutions and distance, as INKE found for itself as it was spread across several institutions and countries (Cummings and Kiesler 2007). But as discovered, this risk can be managed through structure, legitimacy, and work processes built on a common understanding of the research problem and reasons for collaboration (O'Connor et al. 2003).

After years within the collaboration, the interviewees remain positive about the experience and find clear benefits to themselves as well as the project as a whole, thus reinforcing the intrinsic and extrinsic reasons for collaboration (He and Jeng 2016; Siemens and INKE Research Group 2016). Further, the team also

learned that collaboration can create dialogue spaces which bring together researchers and stakeholders alike, allowing for the development and shaping of nascent ideas and research. Conferences such as the partners' meetings where ideas are shared and then articulated through journal articles and conference papers can assist with the dissemination of ideas (O'Connor, et al. 2003; Jeong and Choi 2014; Cummings and Kiesler 2005; Pennington 2011). This dialogue space also helps with the establishment of common ground (Pennington 2011; Olson and Olson 2000) while reinforcing ways to keep people engaged over distances and periods of time of not seeing each other (Olson and Olson 2013; Lawrence 2006). Further, this space creates opportunities for collaborators to learn from each other (Karlsson et al. 2008; Garland et al. 2006; Katz and Martin 1997; Melin 2000). As articulated again this year, as in other years (Siemens and INKE Research Group 2016, 2015), this has then led to different ways of working within an academic setting where the traditional paradigm of solo work is no longer a desired approach (Newell and Swan 2000; Hara et al. 2003). A final benefit is the creation of larger networks which leads to collaboration beyond the grant itself (Katz and Martin 1997; Siemens and INKE Research Group 2014). However, all these benefits can be difficult to measure in a way that journal articles can be.

As found in other years, with positive experiences come challenges. Some of the challenges are similarly articulated in previous years including the timely transfer of funds (Cummings and Kiesler 2005; Siemens and INKE Research Group 2015) and ways to work with research assistants and doctoral fellows and the inevitable turnover that is associated with this group (Siemens and INKE Research Group 2016, 2012a, 2013). Further, collaborating across vast distances, time zones, and institutions can be difficult and INKE, like other teams, needs to continually find ways to keep people involved and engaged (Cummings and Kiesler 2007; Garland et al. 2006; Katz and Martin 1997; Massey et al. 2006). Yearly planning cycles and partner gatherings facilitated this.

This year, though, new challenges were articulated. These included a realization that collaboration requires careful thought and coordination to ensure that projects within sub-research areas and beyond to the other sub-research team and with stakeholders are more than 'parallel play' (Cummings and Kiesler 2005; Lowry, Curtis & Lowry 2004; Siemens and INKE Research Group 2014). In other words, one challenge is moving beyond cooperation, with the focus on one's own interests, to collaboration, which places others' interests first (Jeffrey 2003). Spiller, Ball, Daniel, et al. (2014) describe this as 'letting go' of individual focus and 'coming together' as a team. Ultimately, collaboration is time intensive and does not just happen without effort (Yu, Lau & Lee 2012; Schleyer et al. 2012; O'Connor et al. 2003). As a final challenge, the research team found that the pace of change with the technology used impacted the project itself, requiring flexibility and adaption in planning cycles and from researchers, institutions, and stakeholders. Olson and Olson (2013) describe many of these characteristics as being collaboration ready.

These challenges then informed the types of lessons learned, ones that will be carried forward to new projects. First, the interviewees remarked that change on a variety of levels is inevitable, some of which can be prepared for in advance. For example, the team members needed to develop new ways to approach the research given the rapid change in technology relative to the start of the project. In other cases, the researchers and partners involved also changed over time which meant that teams needed to integrate new researchers and stakeholders quickly without impacting the research progress (He and Jeng 2016; Olson and Olson 2000; O'Connor et al. 2003; Siemens and INKE Research Group 2013). Second, the interviewees also confirmed that collaboration provides benefits beyond that which can be achieved by a single researcher (Siemens and Burr 2013; Karlsson et al. 2008). This sets the stage for further partnerships to be pursued and be potentially successful.

Finally, reflecting on the benefits and challenges just outlined, the interviewees found that they wished they had some additional knowledge at the outset. As noted, interviewees became intimately involved with their research offices and ways to mentor students, things they did not realize that they would need to know initially. They also learned that collaboration takes time and effort on several levels because it is not a natural way of working for many researchers (Jeffrey 2003; Quan-Haase, Suarez & Brown 2014; Borgman 2007, 2009; Blythe and Croft 2010). Finally, they did not understand the level and pace of change, sometimes quite dramatic, faced during their research. If they had known this, they would have prepared for and structured the team and research accordingly.

Implications for Practice and Conclusion

As INKE moves forward to a new project, hopefully to be funded, on open social scholarship, this reflection on the seventh and final year suggests some lessons that are important to nurturing and supporting collaboration, particularly with partners.

First, a team approach is necessary for a large-scale long-term project to be successful. A single researcher cannot accomplish the broad reaching goals and objectives that a collaborative team can. As this reflection shows, many benefits to collaboration exist at both the individual and broader project levels; however, these come with challenges that must be mitigated. Knowing the range of challenges in advance can mean that teams can prepare for and develop the necessary processes to harness the benefits while mitigating these challenges.

Second, change, sometimes quite dramatic, happens within this type of research. At some levels, this is inevitable which means that teams must be prepared for it. These changes can be managed at several levels. Processes that support the work must be adaptable and flexible. A yearly planning cycle that allows teams to incorporate the latest technology within the framework of the research question can be beneficial. Meetings with researchers and partners further support this by creating a dialogue space for conversation about the collaboration and research. The team members themselves must be flexible and must come ready to work together, to put other team members' interests ahead of their own.

Finally, teams need to recognize that it takes time and effort to develop relationships between researchers and partners. In the case of INKE, it took several years of working together before being successfully funded (Siemens 2010) and then another seven years of funded research to develop the collaboration. INKE has already been engaged in dialogue with partners for three years now to prepare for the next phase of research on open social scholarship (INKE 2014b, c). And teams can never relax their efforts in this regard. Teams must continually reinforce their desire to work together and accomplish their research goals. Ultimately, success in this regard means that the partnership can be extended to other projects. In INKE's case, this is a project on open social scholarship. Bringing together a group of researchers who have already collaborated together as well as partners who have been engaged in discussion and framing of the research question, increases the likelihood for success now and moving forward (Olson and Olson 2000; Pennington 2011).

Competing Interests

LS interviewed members of the INKE research team of which she is a member.

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