

Lessons Learned from an Academic, Interdisciplinary, Multi-Campus, Research Collaboration

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Abstract

Background: The formation of productive academic research groups can be difficult, especially in environments without a robust and existing research infrastructure. Idaho and Alaska, are Institutional Development Award (IDeA)-eligible states, historically receiving low levels of funding from the National Institutes of Health (NIH).

Purpose/Methods: We present a case study highlighting an academic research collaboration established across two-disciplines, three-career stages, and three-campus utilizing distance technology.

Results: One lesson learned from our experiences is that regardless of position (junior or senior faculty) or time at the institution/department (new or established), it is important to reach out to others. Collaborations require conscientious effort to establish and maintain. Second, a psychologically safe space must be created, establishing trust. Lastly, in order to eliminate distractions, optimize team performance, and improve deliverables, the team must have a shared mission. Team members must recognize, appreciate, and fully utilize each other and available resources.

Conclusion: Our experiences and lessons learned can be utilized by others to strengthen opportunities to form and grow interdisciplinary research collaborations and develop a stronger research infrastructure.

Key words: Interdisciplinary Research; Distance Technology; Collaborations

Introduction

The formation of productive academic research groups can be difficult, especially in environments without a robust and existing research infrastructure. We present a case study of an academic research collaboration across two-disciplines, three-career stages, and three-campus in an under-resourced academic environment capitalizing on distance technology. Experiences and lessons learned can be utilized by others to strengthen opportunities to form and grow interdisciplinary research collaborations.

Setting

Founded in 1901, Idaho State University (ISU) has campuses in Pocatello (main campus), Meridian, Idaho Falls, and Twin Falls, Idaho, as well as Anchorage, Alaska. ISU, a Carnegie High Research Activity Doctoral University (R2), is Idaho's main Health Sciences University. Idaho and Alaska are Institutional Development Award (IDeA)-eligible states, meaning that they have historically received low levels of funding from the National Institutes of Health (NIH), indicating an opportunity to develop a stronger research infrastructure.¹

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Background

The collaboration featured in this case study involves three ISU faculty members, each located on a different campus.

- Elaine Nguyen, Pharm.D., M.P.H., is based in Meridian, Idaho and is an Assistant Professor in the Department of Pharmacy Practice and Administrative Sciences (PPRA) as well as the Idaho Center for Health Research (ICHR). She received her Pharm.D. and M.P.H. from the University of Iowa. She completed two years of residency with a specialization in ambulatory care at the Boise Veterans Affairs Medical Center and two years of fellowship in health outcomes at the University of Connecticut/Hartford Hospital. Following her postgraduate training, she joined ISU as a tenure-track faculty member in August 2017. Approximately 70% of her workload is designated for research and scholarly activity. Her research interests include delivery and expansion of pharmacy services and health outcomes in chronic diseases, ambulatory care, and rural areas.
- Renee Robinson, Pharm.D., M.P.H., M.S.Pharm., is based in Anchorage, Alaska and is an Associate Professor, in the Department of PPRA and the ICHR. She completed a residency at Nationwide Children's Hospital in Columbus, Ohio and two postdoctoral fellowships: a Pediatric Pharmacotherapy fellowship at the Ohio State University and a Clinical Research fellowship (K-30) through the NIH. A clinical pharmacist with over 20-years of experience conducting community based participatory research

with pediatric and tribal communities, she understands how to engage patients from underserved and under-resourced communities. She joined ISU as a tenure-track faculty member in August 2018 with 60% protected time for research. Her research interests include public health, health disparities, and health outcomes as well as pediatric pharmacotherapy. She has expertise in the use of mixed-methods, clinical and translational research.

- Xiaomeng (Mona) Xu, Ph.D., is based in Pocatello, Idaho and is an Associate Professor in the Department of Psychology. She received her B.A. in Psychology from New York University, M.A. in Psychology and Ph.D. in Social Health Psychology from Stony Brook University, and completed an NIH-sponsored T32 Postdoctoral Fellowship in Cardiovascular Behavioral Medicine at the Alpert Medical School of Brown University and the Miriam Hospital. She then joined ISU as a tenure-track faculty member in August 2013, earning tenure and promotion in 2018. She teaches undergraduate and graduate students (teaching load in her department is three courses each semester) and spends, on average, 30% of her time in research-related activities. Her research interests include teaching/mentoring, behavioral health, and close relationships.

ISU's College of Pharmacy (COP) is the only pharmacy program in Idaho and Alaska, and offers a Pharm.D., graduate programs (M.S., Ph.D.) in biomedical and pharmaceutical sciences, and an M.S. in clinical psychopharmacology. ISU's Department of Psychology offers undergraduate and graduate degrees (Ph.D.s in Experimental and Clinical psychology, it is the only institution in Idaho to offer these Ph.D. degrees).

As research-focused faculty in the same department, Nguyen and Robinson established a working relationship after Robinson joined ISU. They were both hired into their positions to increase research capacity and collaboration at their respective campuses, within their department, college, and the Kasiska Division of Health Sciences. To assist in their efforts, institutional leadership recommended exploring collaboration opportunities with Xu. Although Xu is not within the Kasiska Division of Health Sciences, she is known for her productive teamwork and collaboration with other health science researchers. Like Nguyen and Robinson, Xu is also an active participant in the Mountain West Clinical Translational Research-Infrastructure Network (MW CTR-IN). The MW CTR-IN is a network of 13 institutions across seven IDEa states (Alaska, Hawai'i, Idaho, Montana, Nevada, New Mexico, and Wyoming), funded by the NIH (NIGMS U54GM104944). In December 2018, Nguyen connected with Xu over email and this initiated the formation of their group work.

Current Group Structure

Since Nguyen, Robinson, and Xu first communicated as a group in December 2018, they have had ongoing ~weekly video conference meetings via Zoom. These meetings are structured (although the structure is dynamic and based on the needs of individuals and the group), typically last one hour, and begin with a few minutes of catching up (both socially and professionally by reviewing progress). The majority of the meeting is then devoted to the prioritized tasks with a few minutes at the end of the meeting to discuss agreed upon next steps and assign tasks in preparation for the next week's meeting. Meetings include discussions of research, teaching/mentoring, professional development issues, and collaborations (e.g., research projects, grant applications, manuscripts). Meetings are also used to keep team members accountable (e.g., protected and collaborative writing time) and support each other's growth and development.

Group members meet in-person (once to twice yearly) in conjunction with other travel opportunities (e.g., MW CTR-IN conference). In-person meetings help to provide additional dedicated time (often several hours) for advancing collaborative work and, more importantly, fostering interpersonal relationship building that contributes to the rapport, trust, and functioning of the group.

Perspectives

Nguyen

This is my first position since completing my formal education and training. During my postgraduate training, I held adjunct faculty positions at educational institutions affiliated with the training programs. I participated in didactic lectures, small group facilitation, and precepting of advanced pharmacy practice experiences. Through the completion of two teaching certificates, I was exposed to fundamentals in teaching pedagogy. While all of my past experiences were beneficial to my career growth and led to my ultimate decision to pursue academia, they were limited to defined time periods (e.g., rotations) and single events (e.g., a lecture but not full course coordination). As a new, young, and female faculty member participating in this academic research collaboration, I benefit most from mentorship in research and academia.

Pharm.D. curricula are designed to prepare clinical pharmacists, but not researchers and I had limited opportunities to pursue external funding in my career up until my position at ISU, where funding was an expectation. Working with successful researchers like Robinson and Xu (with external funding records) allows me to see their approach to grant writing. I witness their diligence in tailoring each word to match funders' priorities and overall attention to detail and congruence in their grant proposals. In today's competitive research environment, collaboration with internal and external stakeholders is imperative. I am able to discuss how to approach collaborations (e.g., who to collaborate with/why and when/how to strategically engage others).

There is a steep learning and assimilation process into the world of academia. This can be especially difficult when located away from the main campus as one cannot fully gauge the culture of the full campus environment as well as easily identify context clues (e.g., body language). Robinson and Xu help in my development as a faculty member given their years of experience in academia as well as Xu's connection to ISU and the Pocatello area. This collaboration facilitates research but also nourishes a supportive, strong, empowering environment, which is especially important for me. Robinson and Xu have helped me realize the importance of self-care, work-life balance, and how I portray myself to others (e.g., use of personal pronouns and words like "I'm sorry").

While I have gained so much from participating in this academic research collaboration, I have also contributed. One of my personal strengths is organization, which I use to help the group continue moving forward and ensure meetings are scheduled as an internal group and with external stakeholders. As a clinical pharmacist and new practitioner, I recognize that I may be better positioned to relate to the clinical and student professionals that our work addresses. This allows me to offer different perspectives and approaches. Lastly, my perspective as a new practitioner also means that I lacked some foundational background that the other group members possess. While I ask seemingly basic questions, this also ensures that processes are appropriately explained in written proposals to external reviewers.

Robinson

This is my second faculty position, having spent approximately nine years at The Ohio State University during my residency, fellowship, and later as a tenured-track faculty member in the Department of Pediatrics. In 2008, I left academia and joined the United State Public Health Service to develop a satellite pediatric pharmacy program. However, within two years my interest in research returned and I started conducting research with and for the tribal community in Alaska. Serving as a principal investigator and co-investigator on numerous funded research projects both within the academic (eight-years) and community (nine-years) setting, I felt comfortable coming back to both teaching and academia. However, I was a little unprepared for navigating the established ISU system which utilizes distance learning technology to synchronously deliver course material and establish research partnerships and collaborations. Familiar with general system expectations and administrative resources, I felt comfortable asking for the support I needed, but was unfamiliar with who to ask, where they were located, and which of the many technology systems the information would be needed. In addition, ISU COP has over 100 years of history and there is significant historical knowledge among the tenured faculty. While I appreciate the stability this history offers, it also comes with challenges such as locating processes and policy documents that are not documented and/or centrally located. Unlike other systems that I had previously worked, where I could walk over to a staff member's

office and ask my question in-person, almost all interactions are remote and I have to take into account a two-hour time zone difference between Alaska and Idaho.

As a faculty member new to ISU, I benefit most from system mentorship and virtual introductions to individuals across the organization I receive from collaborations within and outside of this group. Working with ISU researchers across the different campuses on three grant submissions within the first six-months of my appointment helped connect me with the necessary administrative and support systems I need in order to succeed at ISU. Current and potential future collaborators across programs and divisions serve as mentors for the system, connecting me with necessary supports and individuals and identifying the unique strengths of the organization as an incubator for change within the community.

I have gained so much from participating in this academic research collaboration, which has allowed me to submit proposals to address health concerns and interests that I am truly passionate about. However, it is the impact I have had on others, the faculty and students I mentor, that has been the most fulfilling. Having left and returned to academia I feel I have a more realistic view of the challenges one might face, an understanding of how to deal with them, and the ability to better differentiate what is really important. My diverse experiences have given me a unique perspective, identifying opportunities that may not be readily apparent to everyone, and pursuing them without the sometimes debilitating fear of failure I had as a young academician. I feel fortunate being able to support others in pursuing their dreams, helping them address their fears, and see their potential.

Xu

This is my first position since completing my formal education and training. My training and research background in graduate school and postgraduate training were interdisciplinary (social psychology, behavioral health, neuroscience), and one of the reasons I was drawn to ISU was the general experimental psychology Ph.D. program which was a strong fit for my diverse and multidisciplinary interests. Given my interest and background in behavioral health, I was excited at the chance to collaborate with two pharmacists with a strong track record of health-related work. I was especially interested in their expertise in rural and underrepresented populations, populations I have not had much experience with in the past (my training institutions were in urban areas) but deeply value working with.

In the past year, I've learned so much about healthcare, rural needs, health disparities, and the issues that affect providers from training through their professional day-to-day lives. We have in-depth conversations on issues of access, limited resources, and unique challenges/barriers, and brainstorm ways to help our fields move forward and to improve healthcare in underserved regions and healthcare training for

those interested in working in rural areas and with underrepresented populations. These conversations lead to designing collaborative research together as well as written products for funding and publication. Our weekly meetings provide me with invaluable professional development as I transition to a deeper rural health and teaching/mentoring focus in my work. Nguyen and Robinson have been very inclusive colleagues, introducing me to others in their field or related fields, and helping me network effectively at conferences.

In addition to more tangible professional benefits, our collaboration has also been incredibly beneficial to my wellbeing and overall job satisfaction. From our first Zoom session together, we “clicked”, and getting to spend an hour with these brilliant and compassionate women is one of the consistent highlights of each week for me. No matter how stressful or overwhelming work is (or how chaotic life gets, e.g., the COVID-19 pandemic), I know I get to see their smiling, friendly, and supportive faces every week *and* engage in productive activities together.

We provide each other with a safe space to discuss sometimes difficult topics - openly, supportively, and nonjudgmentally. These include work-life balance, self-care, imposter phenomenon, burnout, rejection, academic guilt, and being a woman/underrepresented person in science. We build each other up, encourage each other to practice self-compassion, freely share our knowledge, promote each other, recognize each other's expertise, and provide constructive criticism (including pointing out negative self-talk or other behaviors like excessive apologizing, that we want to change). Finally, we engage in regular capitalization, sharing positive events with each other and responding in active ways (e.g., celebrating together) that enhance wellbeing above and beyond the events themselves. All these positive interactions have not only benefited me but also helped me become a better teacher and mentor, and to model a more productive and balanced working life to my students and colleagues.

Lessons Learned

We learned the importance of: 1) reaching out to others and creating a psychologically safe space with trust in your collaborators, 2) recognizing, appreciating, and fully utilizing each other and available resources, and 3) sharing a mission to eliminate distractions, optimize team performance, and improve deliverables. Although we are not experts on team science, these lessons learned represent *our* experiences that may be beneficial to others.

Group Formation and Development

Collaborations require conscientious effort to establish and maintain. One lesson learned from our experiences is that regardless of position (junior or senior faculty) or time at the institution or within the department (new or established), it is important to reach out to others to start conversations. In our

case, communication began when one group member asked an administrator (who had strong knowledge of the institution and researchers across departments) for suggested connections. The next step was a “cold” email with a brief introduction, a mention of the administrator (a recognized connection), and a courteous invitation to chat about overlapping interests. Our group was lucky that this communication quickly led to a great working relationship, but we recognize the importance of being ready and willing to continue to reach out (both to colleagues who could provide guidance and networking connections as well as potential collaborations) and to expand our search should there be no response or inadequate fit.

This type of active engagement in group formation takes time, patience, and persistence, and is especially important in rural regions where researchers and resources are less densely concentrated and may not be brought together without concerted effort. We learned to reach out to others and to utilize the opportunities available to us. For example, IDeA program grants, funded by the NIH, such as the MW CTR-IN Pilot Grants support training, research capacity building efforts, and establishment of cross-state partnerships through the formation of virtual teams, groups with a shared purpose that work interdependently on a shared project or research initiative. The support provided helps states with low levels of NIH funding such as Alaska and Idaho conduct research more applicable to the rural and underserved communities they serve. Our involvement with MW CTR-IN through the annual conference, funded pilot grants, and connections with others in the network, provided a helpful backdrop for our group.

Once formed, successful teams “require carefully structured, sequenced, and selected negotiations and interactions.”² Starting with our first meeting, we made sure to clearly, explicitly, and regularly communicate our goals, roles, and expectations (for ourselves and each other), with the understanding that these could all change over time as projects progressed. We also established a regular weekly meeting time (with adjustments as needed understanding that teamwork across time zones comes with unique scheduling challenges) via videoconferencing (Zoom). Over time, we developed a default structure for each meeting that works well for us: A few minutes of catching up and socializing (expanded if support and more discussion is needed), a reminder of what occurred in the last meeting and what has been accomplished in the interim, addressing agenda items via discussion or another productive use of time (e.g., working on a written document together), and a wrap-up including assigning individual tasks to be completed before the next meeting (these tasks get added to the calendar item for easy reference). Using this structure, we can ensure that we are all on the same page, we are efficient with our time (each meeting is an hour), and we are all clear on each person's tasks and our work does not unnecessarily overlap. Our common engagement through the MW CTR-IN network has also been helpful in enhancing our interdisciplinary multi-state partnership. We complement our weekly virtual meetings with

at least one annual MW CTR-IN meeting where we can bond and work together in-person across days. We have also utilized the network to find others who could advise us on research, grant writing, mentoring, and/or who could collaborate with us on specific projects.

The second edition of *Collaboration and Team Science: A Field Guide*, published by the National Cancer Institute, offers guidance on effective team research.³ While the guide's 12 chapters provide advice on a number of topics, one of the important themes is that teams fare well when members build strong relationships with each other. This rapport develops best when there is shared vision, clear communication, trust, and a sharing of success. Based on our experiences, we agree that these factors are extremely important, and especially so for teams such as ours that are formed and function predominantly at a distance. Because we cannot simply pop into each other's offices and will not just happen to run into each other, we very consciously make sure to meet at least weekly and spend some of each meeting deepening our trust and comfort with each other. This has led not only to seamless group work and enhanced productivity, but also to increased morale, strengthened commitment to our institution, and a group culture of support, cohesion, and constructive and compassionate feedback.

Optimization of Interdisciplinary Research Collaborators

Optimization of the strengths and resources of each individual team member allows interdisciplinary research collaborations to be most efficient and effective. To do this, we learned that team members must recognize, appreciate, and fully utilize each other. This process often takes time and we are thankful that we were able to create a psychologically safe space to allow us to get to know each other.

In our experience, most introductions to faculty in other departments are brief covering name, department, and a list of research interests. This introduction can eventually lead to more in-depth discussions and foster collaboration when individuals develop a greater awareness for how they can work together. We learned of each other's strengths and resources offered when we prepared a grant submission together as we had to develop and share biographies, publications, resources, etc. This was especially helpful as we all had access to different resources given our residence at three different campuses. For teams working across different sites, we recommend discussion of institution-specific resources. While the grant process highlighted tangible achievements and resources, it also allowed our individual strengths to become apparent. For example, Nguyen helped organize meetings and utilized her interpersonal relationship skills to establish connections between the team and other collaborators, Robinson led efforts to brainstorm sellable grant ideas and shared resources from previous successful grant applications, and Xu utilized her background in psychology to ensure our ideas were logical and theory-based.

At the same time, our institution was offering Gallup's Strengthsfinder assessment to faculty. Independently of our work on this research team, we all took the assessment and shared our strengths.⁴ Not surprisingly, we discovered that our natural tendencies and roles within the team also matched our identified strengths. While data on the use of Strengthsfinder in interdisciplinary research teams is limited, there is some data to support its use in improving business performance outcomes.⁵ Assessments like Strengthsfinder may be useful to help other teams more quickly identify their strengths and team roles. Similarly, assessments like the Thomas-Kilmann Instrument, which determines how individuals tend to respond to conflict, may also be useful.⁶ While these types of assessments have limitations, we believe they can be useful to help initiate conversations, potentially accelerate recognition of individual tendencies, and increase both intra- and interpersonal awareness, which has been identified as important in team science.³

The recognition, appreciation, and utilization of all team members allows for synergistic outcomes to occur. We believe that differences should be celebrated and capitalized.

Shared Mission

Multidisciplinary research encompasses the interests and diverse perspectives of its group members, and the trend toward multidisciplinary research collaborations within healthcare and academia continues to grow.⁷⁻⁹ The benefits of multidisciplinary research have been long recognized. However, in order to eliminate distractions, optimize team performance, and improve deliverables, the team must have a shared mission.

Mission statements help stakeholders (e.g., providers, researchers, and administrators) reach a shared or common understanding, focusing resources and efforts to achieve a common "bigger picture" goal. It helps us understand why we do what we do, why anyone, including us, should care about and/or get behind the work we do. Mission statements have been shown to have a significant impact on organizational performance.¹⁰⁻¹³ The process of communicating the mission for the organization or program has been shown to energize people, establishing a shared awareness of what is expected, focusing energy, providing direction, and affirming an individual's purpose and position in the decision-making process. In academia, the mission must align with the mission of the organization, the college, the division, and the healthcare systems with which we partner.

An important lesson learned from our experiences, is how to openly and effectively discuss mission (and vision), and come to a consensus that guides our work. Our collaboration across colleges and divisions, is grounded in the mission of ISU, to advance scholarly endeavors "through academic instruction and the creation of new knowledge [and] research", to provide

“leadership in the health professions, biomedical, and pharmaceutical sciences”, and to engage and impact “communities through partnerships and services.”¹⁴ Regular discussions about our values, goals, and experiences helped us establish that this institutional mission fits well with our individual and group objectives, and gave us a shared starting point and overall framework for our collaboration. Further, our group also identified with ISU’s Core Theme Three: Leadership in the Health Sciences, and could easily connect our research and grant application plans with this theme of providing “statewide leadership in the health sciences”, creating new knowledge “through biomedical, translational, clinical, rural, and health services research” and providing “interprofessional education and excellence in patient care” through “teaching, research, practice, and community partnerships.”

The projects we focused on were chosen to capitalize on team member expertise, with a goal of tailoring knowledge and resources to better support our regional and rural communities. Our first grant application aimed to address the perceived (or real) lack of educational support available to underserved rural communities. Within this project team, we capitalized on patient-centered interprofessional team experience, pedagogy (including distance mentorship of health professionals), and community participatory research experience to establish multidirectional mentorship between communities (patients and healthcare providers) and educational institutions (faculty and students). This partnership is essential to provide the necessary support, information, and collaborative environment needed to successfully accelerate rural healthcare.

Conclusion

Our experiences and lessons learned can be utilized by others to strengthen opportunities to form and grow interdisciplinary research collaborations and develop a stronger research infrastructure.

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