Achieving Successful Collaboration in Higher Education

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INTRODUCTION

A great many scholarly books and articles highlight the benefits of academic collaboration, sometimes including anecdotal evidence of successful partnerships. Higher education is evolving in response to cultural changes and the demands of the 21st century economy, with hybrid delivery systems, blended learning models, increasing interest in interdisciplinarity, and other types of collaboration representing just a few of these trends. Nevertheless, these innovative approaches to learning are not as prevalent as we might expect given the attention they have received, and those who decide to engage in partnerships across disciplinary boundaries can find that organizational systems and institutional policies present unexpected challenges. Colleges and universities are making strides to address the factors that complicate collaboration, but the process of changing established systems seldom occurs with rapidity. Fortunately, educators do not have to wait for these changes to occur. By taking a practical, commonsense approach focusing on establishing communication and developing a comprehensive plan of action, it is possible to achieve successful partnerships, alliances, or collaborations compatible with existing institutional structures.

PROBLEM: TEAMWORK VS INDIVIDUAL ACCOMPLISHMENT

The workplace outside of academia has become increasingly collaborative, a trend extending across professional fields, even to those that were historically more solitary. For instance, an electrical engineer employed by Ford Motor Company will likely be part of a design

team, working alongside powertrain engineers, auto body designers, computer scientists and others—one member of a complex group that must know how to innovate and collaborate in order to produce a functional and salable product. Education, too, has become increasingly collaborative in the past decade, with many public school districts requiring teachers to work in Professional Learning Communities, administer common assessments, and plan lessons in teams rather than working alone, as was once the norm. Corporations often refer to their employees as team members, we speak of management or marketing teams, and even contexts dependent on individual accomplishment, such as accounting, organize employees in collaborative work groups.

Furthermore, career trajectories have changed dramatically in recent years. New graduates formerly had a reasonable expectation that they could find employment in their field immediately upon graduation and work for the same company for many years, perhaps even for their entire career, allowing time to transition from an entry-level position up through the ranks, learning the corporate culture and building interpersonal and professional skills along the way. Today's graduates, on the other hand, must be prepared to take their places as effective team members in a fast-paced, competitive corporate environment from their first day on the job. Outstanding disciplinary knowledge is not enough if someone cannot work successfully with others and cannot think broadly and creatively outside of an individual area of expertise.

Although the corporate workplace emphasizes teamwork, and even though we may hold partnerships in high regard and work within a collaborative environment, our culture actually tends to value the rugged individualist, the lone genius, or the visionary leader. For instance, when we consider Microsoft, we think of Bill Gates; and when Apple comes to mind, we remember Steve Jobs, not the teams of individuals who brought these companies to life. Even in an inherently collaborative context such as a team sport like basketball, we laud the star players or the coach over the entire team's effort; in an award-winning film, we talk about the leading actors or the director, even though the film involved scores of individuals all working

together. Contradictory values of teamwork and individualism become apparent in many spheres of activity, higher education being only one among them.

While the corporate sector and other areas of the economy grew more collaborative, colleges and universities sought to refine and enhance their educational product through increasing emphasis on disciplinary specialization. Differences between learning areas grew and evolved over time, leading academic departments to develop their own approaches to the delivery of instruction, research methodologies, and philosophies guiding scholarly inquiry. They became separated from one another, operating in isolation, until the educational landscape came to be characterized by the prevalence of disciplinary "silos." This term is not meant to imply a tower or pit on a farm in which to store or compress green crops—rather, it is employed metaphorically, and critically, to indicate how thoroughly closed off the disciplines can be from one another.

Nevertheless, a focused approach to learning is not without merit. Whether we're considering music, theatre, medicine, engineering, or plumbing, producing students who are strong disciplinarians is beneficial: we surely want professionals who are experts in their fields and who possess a deep understanding of their chosen discipline. Few would argue that physicians, for example, should forego an intense focus on their chosen area of study, since human lives literally hang in the balance once these students embark upon their eventual careers. However, a closed system prohibits or problematizes our ability to produce the kind of robust, adept disciplinarians who can bring their knowledge and skills to collaborative learning and research environments, projects and studies. The 21st century economy demands expert knowledge alongside the ability to work with others towards a mutual and instrumental benefit, improving the quality of life and the world in which we live.

Individual learning is the transcendent value undergirding almost all educational activity, whether we consider this from the perspective of a student or a faculty member. The essential nature of higher education has remained rooted in the acquisition and transmission of

knowledge for more than a thousand years, but for perhaps the past hundred years this activity has been embedded in new layers of organizational structure and policy. Institutions thrive on rules and regulations, on assessment and statistics, and they must therefore find ways to quantify learning, resulting in an emphasis on the observable activities of research, teaching, and service in order to determine the policies, practices, programs, and utilization of personnel in our educational organizations. These activities also determine the basis of rewards through promotion and tenure, which drive the activities of faculty members. However, each of them may be seen to contribute to and support individual learning, which is the central focus of education. Whether we consider research, teaching, or service, each contributes to student learning, either directly or indirectly.

1. The purpose of research is to build upon existing knowledge to create new learning.
2. The purpose of teaching is to improve and expand upon student learning.
3. The purpose of service is to translate learning into action and to provide learning to improve communities and citizens.

An emphasis on individual accomplishment is evident in all facets of education. Beginning in the primary grades, student report cards communicate information about personal academic achievement, a practice that continues through graduate school. At the highest level, doctoral students must complete an individual dissertation and are awarded a degree based on singular academic achievement. Once hired at an institution, entry-level faculty members must strive earnestly towards individual accomplishment, meeting departmental norms if they hope to achieve tenure, and this remains true for tenured faculty members attempting to earn promotion. In many disciplines, longstanding reward systems tend not to accommodate collaborative work well, since it's difficult to discern which parts of a project can be credited to the person who is being considered for promotion and tenure, discouraging engagement in atypical or nontraditional projects. Furthermore, faculty members who do choose to work in ways that

diverge from standard expectations may meet with opposition from their peers, who may prefer the status quo or be reluctant to embrace innovation.

SOLUTION: PREPARING FOR COLLABORATION

Based on these observations, we can recognize the primary challenge to collaboration in higher education: academic culture is built upon the ideal of individual accomplishment, academic specialization, and discrete departmental structures and organizational systems. Institutions recognize the problems with silos and the discrepancy between discipline-focused education and the demands of the present-day workplace, engendering numerous efforts towards collaborative approaches to teaching and learning. Variously, these might be termed:

Interdisciplinary	Intradisciplinary
Transdisciplinary	Inter-collegiate
Multidisciplinary	Intra-collegiate
Crossdisciplinary	Trans-collegiate
Extradisciplinary	Extra-collegiate

Each of these designations has its supporters and, as with many things in academia, the fine shades of meaning between them are sometimes a source of debate, if not simply misunderstanding. For the purposes of this discussion, it's not important to engage in a thorough exegesis of each term; rather, the goal is to build understanding around the more comprehensive idea of collaboration—working together across disciplinary boundaries, whether in somewhat related areas such as art and design, or vastly different areas such as theatre and robotics. As these ideas relate to instructional methodologies, we often speak of collaborative learning, nexus learning, or engaged learning.

We might recognize that the ideas of collaboration, innovation, and technology have become somewhat comingled, but this is not necessarily the case. Collaboration and innovation intersect, but they are not mutually dependent. Certainly, collaboration between siloed disciplines can be innovative, but not all innovation is inherently collaborative, nor is all

collaboration necessarily innovative. Technology similarly appears as an important element of both innovation and collaboration, but it is not an integral or necessary component.

Rather, collaboration should be understood at its most basic level: two or more people working together on a shared project, concept, or venture. This may be a co-taught class, a research project, or another effort, all of which ultimately support the overarching mission of higher education—to promote learning. Fruitful alliances and collaborations share several key factors.

- They are strategic, not tactical, meaning that their success depends on taking a prudent, judicious approach to the implementation of an idea.
- They foster mutual/shared cooperation and responsibility. Both partners must approach the project as active participants, building a professional relationship founded on shared values.
- They exist for the accomplishment of a specific purpose or objective. Collaboration is a goal-driven enterprise.
- They look to the future, considering the continued feasibility of a project, issues pertaining to sustainability, or further collaborative endeavors between partners.
- They feature tight, informed, and mutually beneficial connections between collaborators, which may not always be equal, but which must always be equitable.

Before we can plan for successful collaborations, we must consider the constraints under which each of the proposed partners must work. Expectations between departments are built upon traditional and inherent asymmetries, especially as these pertain to the systems of instructional delivery.

Contact Hours and Credit Hours

More often than not, one of the most significant obstacles to collaboration, especially those involving the arts, lies in requirements for contact hours—the number of hours a student is "in contact" with an instructor—because this is much different in the arts than in other learning areas. Generally speaking:

- One contact hour is usually interpreted to mean one hour of actual time spent in the classroom with students.[1]
    - A 3-hour class might meet for:
        - one hour, three times per week
        - ninety-minutes, two times per week
        - three hours, once per week
- A semester is typically 16 weeks long, with 15 weeks designated for instruction and one for final exams, bringing the total to 48 hours per course. (This may vary between institutions, which sometimes account for the final exam differently.)
- Studio art classes are subject to different methods of calculating time.
    - Studio hours are counted at half the rate of classroom lecture hours.
    - Therefore, a three-credit hour studio course might actually meet for 96 clock hours each semester.
- Colleges and universities have finely tuned this system. If they fail to meet contact hour requirements upon audit, they face scrutiny and possibly corrective measures, so they must be meticulous about these policies.

Impact on Collaboration

Why does this matter for collaboration? If the people who want to work together each teach or work in a field that counts contact hours in the same way, it might not be problematic.

[1] What constitutes an hour of class time may vary between institutions.

However, if the method of calculating contact hours differs between potential partners, this can significantly impact the proposed course or project.

Collaborative Teaching

Let's create a hypothetical illustration. Professor Smith teaches studio art/photography, and he wants to work with Professor Jones, who teaches anthropology. They decide to develop a course in visual anthropology, in which students will create documentary photographs portraying different social groups. Presuming that each of these professors has a 100% tenure-track appointment, depending upon the particular institution, they may only be required to teach two 3-hour courses per semester. For Professor Jones, each individual anthropology class includes three hours per week spent in the classroom lecturing—six hours for the two courses when combined and totaled. For Professor Smith, on the other hand, each individual photography class involves six hours per week spent in the studio—twelve hours when the two are combined and totaled, only a small portion of which might include lecture, with the remainder spent supervising students as they work independently to create photographs. Therefore, Professor Smith and his students have to be in the photography classroom for twice as many actual clock hours as Professor Jones and his students in anthropology.

Professor Jones Anthropology	**Professor Smith Photography**
6 hours lecture (3 per class)	12 classroom/studio hours
10 office hours (5 per class)	10 office hours (5 per class)
4 hours of prep (2 hours per class)	4 hours of prep (2 hours per class)
20 hours for research and service	14 hours for research, creative activity and service
40 total work hours per week	40 total work hours per week

How, then, should their collaborative class be scheduled? Three hours of classroom time as with an anthropology course? Six hours as with a studio art course? Should they split the

difference and meet for four-and-a-half hours? Must both professors be present the entire time? These questions are going to be answered differently by every pair of proposed partners, and this will also depend on the views their administrators take towards the collaboration.

Collaborative Research

Contact hours can also impact research collaborations. As but one hypothetical example, let's say that Professor Johnson of the chemistry department approaches Professor Williams of the graphic design department about working on a collaborative research project involving data visualization. Again, we will presume that they both have 100% tenure-track appointments and a responsibility to teach two courses each semester. Since they're not going to teach together, contact hours shouldn't be a problem, correct? Unfortunately, it's not so simple. Let's compare their actual workloads.

Professor Johnson **Chemistry**	**Professor Williams** **Graphic Design**
6 hours lecture (3 per class)	12 classroom/studio hours
10 office hours (5 per class)	10 office hours (5 per class)
4 hours of prep (2 hours per class)	4 hours of prep (2 hours per class)
20 hours for research and service	14 hours for research, creative activity and service
40 total work hours per week	40 total work hours per week

Therefore, Professor Williams has 30% less available time to devote to the collaborative research project. Unless the two partners agree to limit their time to an equivalent number of hours per week, this may either place Professor Williams at a disadvantage or require him to work overtime, for which he will not be compensated. The logistics of the project might also impose a problem for one partner or the other, since it's likely that their work areas will not be located in the same place, necessitating that one person must spend time traveling to the other's lab, studio, or office in order to work together. Both partners will need to fully document

their participation in order to receive consideration for promotion and tenure, so it is important to achieve an equitable distribution of work and ensure that the partnership will be mutually beneficial.

Administrative vs. Faculty Concerns

When contemplating a collaborative venture, potential partners must consider that their own concerns and those of their administrators may differ. Administrators tend to think in terms of the "big picture" and must constantly bear in mind such things as budgeting, accreditation, legal ramifications, institutional effectiveness, and student retention. Faculty members, on the other hand, might be more concerned with the impact of their work on their particular department, career enhancement, professional reputations, or larger issues such as academic freedom.

A hierarchical structure exists, which is usually beneficial. However, innovative ideas traveling from the top down may or may not be received with much enthusiasm, whereas those that travel from the bottom up can cause administrative concerns if not well-conceived. Moreover, considerations on both the administrative and faculty sides of the equation differ greatly between departments. Notably, a significant asymmetry between learning areas arises in the expectation that most faculty in the arts will engage in creative practice rather than the formal research conducted in other learning areas. For example, a professor in the humanities is judged on the basis of publications—more often than not, of single-author monographs—whereas a professor in the sciences may be judged on publications, inventions, patents, and the level of grant funding he or she is able to secure. Professors in the visual and performing arts are judged on exhibitions or performances. And finally, professors in creative writing or poetry are judged on publication of their written works. When two or more individuals collaborate across these boundaries, administrators and colleagues cannot always account for activities that diverge from the norms they expect to see. How should they evaluate a professor of dance

who is listed among the researchers on a physics project? What kind of credit can they give to a professor of mathematics who co-taught a course in sculpture that concluded with a public exhibition rather than a published journal article? In the absence of precedent or tradition, such considerations can problematize collaboration or discourage interested individuals from even making the attempt.

Inequitable Resources

In addition to asymmetric contact hours and administrative expectations, collaborators from different learning areas sometimes encounter a markedly inequitable distribution of resources. More funding is available to STEM subjects than to the humanities or the arts, and the same is often true of facilities and equipment. In terms of grant funding alone, the arts and humanities combined receive less than $0.50 for every $100.00 awarded to the sciences.[2] STEM professors' research grants might "buy out" their teaching time, freeing them from classroom responsibilities, but this is rare in the arts. Therefore, a scientist who seeks to collaborate with an artist should take this asymmetric state of affairs into account, understanding that the artist's time might be more scarce than her own, the artist may or may not have funding for art supplies or assistants, and that the artist's work within the collaboration might not meet with favorable peer review within the arts or acceptance towards her career advancement efforts.

Just as resources vary widely between departments, they also differ between institutions. Some colleges and universities support collaboration enthusiastically and have made notable inroads towards more equitable systems of promotion and tenure, providing structures to support co-taught or interdisciplinary courses, and establishing centers or institutes where research collaborations can thrive. Others educational institutions, however, continue to maintain a more traditional approach. Prior to entering into a collaboration, potential partners

[2] American Academy of Arts and Sciences, Humanities Indicators. https://www.amacad.org/binaries/hum_report_card.pdf

should thoroughly investigate what resources might be available to them. They may also wish to learn about administrative policies towards collaborative curriculum or research and to determine which administrators are most supportive of innovation. Additionally, it might be helpful to know if similar collaborations have occurred previously, since the ability to cite precedents can be advantageous in discussions with administrators and colleagues.

Practical Solutions

Individuals who wish to attempt collaborative teaching or research, especially when it crosses disciplinary divisions like the examples described above (anthropology and photography; chemistry and graphic design), should fully do their homework before approaching their administrators for approval of their proposed project. Preparation should occur in three stages, although these are not necessary hierarchical. They include:

1. An in-depth discussion of the partners' values and expectations for the collaboration
2. Creation of a detailed plan for the project or course
3. An assessment of institutional resources

These steps will differ somewhat depending on the intended outcome, but many of the general principles hold true for both curricular and research partnerships.

Values and Expectations

Establishing clear communication from the very start of a project is essential to successful partnership. The following interview questionnaire may prove useful for that purpose.[3] Partners should complete the interview questionnaire independently, answering each question thoroughly. At their next meeting, partners should exchange questionnaires and discuss one another's responses, which should hopefully result in a strategic understanding of one another's perspectives, expectations, and values. The questions have been designed to apply to both curricular and research partnerships.

[3] A fillable form of this questionnaire is provided in Appendix 1.

Pre-Collaboration Interview Questionnaire

1. What is my vision for this project? (*Be as specific as possible*)
2. As I understand it, what is the scope and purpose of this project?
3. How will the project be funded? *(If this has not yet been determined, what possible funding sources do you recommend?*)
4. What do I hope to gain from this collaboration? (*Rank the following statements in order, with 1 being your most important motivation for participating in this collaboration. Select only those that are relevant to you.*)

   _____ improved student learning
   _____ improved pedagogical practice
   _____ advancement of personal/professional research
   _____ enhanced creative practice
   _____ discovery of new knowledge that can subsequently enhance student learning
   _____ discovery of new knowledge that can improve the quality of human life
   _____ enhanced professional standing via publication
   _____ enhanced professional standing via an exhibition or performance
   _____ documenting achievement that can be applied towards promotion or tenure
   _____ meeting an external requirement (department, institution, or third-party)
   _____ enhanced status or recognition from/in/among: (check all that apply)
      _____ my department
      _____ the institution
      _____ other scholars in my discipline
   _____ enhanced institutional status
   _____ competition with/emulation of peer institution(s), organization(s), or individual(s)
   _____ direct financial reward
   _____ other (please specify):_____

5. What is my availability? (*Input your weekly schedule below*)

	Monday	Tuesday	Wednesday	Thursday	Friday
8 a.m.					
9					
10					
11					
12 noon					
1 p.m.					
2					
3					
4					
5					
Evening hours					
Weekend availability (if any)					

6. What other commitments do I have that might impact or conflict with this collaboration? (*Ex: speaking engagements, upcoming professional conferences, upcoming performances or exhibitions, personal factors*)
7. What are my expectations regarding our meetings and/or shared work sessions:
    a. Where will we meet?
    b. When will we meet?
    c. How often will we meet?
    d. How long will our meetings be?
    e. Who else should be present at our meetings?

8. Deliverables:
    a. What deliverables do you expect from me, and when?
    b. What deliverables do I expect from you, and when?
9. Though redundant, what is the written timetable and schedule for accomplishment of these deliverables?
10. What challenges or impediments do I anticipate?
11. How do I suggest we prepare for these challenges or impediments?
12. How will this collaboration enhance learning?
    a. How will my students benefit?
    b. How will your students benefit?
    c. What do you and I expect to learn from one another?
    d. How will our learning in the project impact our teaching and/or service?
13. How will this collaboration enhance the reputation or status of the college or university?
14. How will we ensure that this is an equitable partnership?
15. What are my preferences for contact and communication? (*College/university email, personal email, text message, office phone, home phone*).
16. Do I want to set restrictions on contact methods or timeframes?
17. What other information do I feel you should know prior to entering into a partnership with me?

Collaborative Courses

Once the partners have established a mutual understanding of their values and expectations, the next step in planning a co-taught course is to create a comprehensive plan and syllabus for the course, including:

- Outcomes and objectives aligning with the expectations for both departments
- Schedule of lectures and assignments

- Lesson plans
- Quizzes and exams
- Pre- and post-course surveys
- A plan for who will lecture on each topic, and what the other partner is doing at that time
- A plan for who will supervise students during studio or lab sessions (if any)

With this plan in hand, the partners should arrange a meeting with the deans or other administrators, present the plan, and determine a system for receiving appropriate credit for their teaching. They also need to accomplish the following tasks:

- Locate a space or spaces where the class can meet.
- Determine an appropriate way to list the course, one example being cross-listing, whereby students from each disciplinary area can register for separate course numbers and/or titles, but meet in the same place at the same time. For our Visual Anthropology class, students in anthropology might register under ANTH 205 Visual Anthropology, taught by Professor Jones, while photography students might register under ART 205 Visual Anthropology taught by Professor Smith. (The course numbers are fictitious, but hopefully the idea is clear.)

One possible scenario is for Professors Smith and Jones to approach their administrators and request that the proposed class be designated as a lecture course, not a studio course, even though it involves an art-making component. Students would complete all of their creative assignments as homework, not during actual class time, just as they typically write research papers outside of class, thus eliminating the need for a lab or studio component. (Precedent for this exists in online digital photography courses, which do not have a studio component or required lab time.) The course would then meet for two ninety-minute sessions per week.

Because both professors want to receive full credit for their teaching, each must be able to prove that her or she is actively lecturing for the entirety of each class period. Therefore, each professor would prepare a 45-minute lecture for every class period and deliver it twice, switching groups of students halfway through the class. For instance, the students who had registered under the anthropology course number would hear Professor Jones speak about anthropology for 45 minutes, then switch places with the photography students and hear Professor Smith's 45-minute photography lecture. In this way, all students receive the benefit of instruction from both professors, and both professors are teaching for the full class period. Certain class sessions would need to combine both groups, such as for student presentations of their visual anthropology projects. In that case, Professor Smith could address the artistic and aesthetic aspects of the students' work, while Professor Jones would address its anthropological merits.

This structure would require some special considerations for meeting space, using either two classrooms located in the same building—preferably in the same hallway—or in a space large enough to accommodate all of the students and yet provide a way to break into two substantial groups for the lectures, while also allowing them to meet as one group for presentations of student work.

If the administrators and registrar can work with the two professors to lay the structural groundwork for the course—determining the contact hours, providing for the cross-listing, and finding an appropriate space for the class to meet—this partnership has a greater chance of success. Nevertheless, the professors should not approach their key administrators without a fully developed plan in mind. Instead of asking, "How can we make this happen?" they should say, "This is how we want to make our course a reality. Here's what we need from you." A concrete plan will almost always have a greater possibility of gaining approval than a great idea accompanied by no plan at all.

One of the benefits of this particular proposal is that it requires very little in the way of extraordinary physical or financial resources. Students register for the class just as they always do. The professor teaches his or her usual number of credit hours and usual number of students. The class may require standard digital AV equipment, perhaps a stationary computer upon which images can be transferred and shown and appropriate software, but not much more. The only things being asked of the administration are to approve the studio art professor to teach a lecture course rather than a studio course, and to assist the professors in finding a space for the course to meet. The course does not require sweeping institutional change in order to occur—it works within the existing system. Certainly, by taking the bold step of planning and executing a collaborative course, the professors are serving as agents of innovation, but in a subtle manner. Their example sets a precedent that others can easily follow and that could result, over time, in further collaborations.

Collaborative Research

Considerations associated with a collaborative research project are a bit different than those involving teaching or curriculum. Discrepant contact hours and workloads are still a potential problem in terms of finding time to work together, but presuming that the partners are able to reach an agreement regarding a work schedule, the next problem is that of how credit for the research will be determined. In the sciences, physics in particular, it's not unusual for many people to be listed as members of a research team and on subsequent publications by that team, which is a crucial factor in considerations of promotion and tenure for each of those named individuals. As stated previously, in the humanities we might recognize that there is a greater emphasis on individual accomplishment, although research collaborations or partnerships are not unknown or unusual. However, in the arts, research is a different proposition, with its own unique manifestations in each artistic sub-discipline. Arts faculty are recognized for their individual creative practice, whether choreography, dramaturgy, music

performance, production of visual artworks, or another field of making or performance. Although they may well engage in research during the creation of their artistic works or performances, they do not usually document their process or publish in professional journals. Art appears to have "appeared," its process of creation left invisible, while the products of formal research are typically supported by extensive documentation.

Creative presentation of research can facilitate the communication of complex ideas to an audience, much more so than hundreds of pages of text. Growing demand for artists to provide these contributions presents some crucial questions as to the role of the artist in the research process. Systems of recognition and reward are not always prepared to handle the accomplishments of individuals who work outside of disciplinary boundaries, especially if their efforts are intertwined with those of their partners (as noted earlier in this discussion). Nevertheless, partners and collaborators should seek cross-disciplinary recognition for their work in an effort to press the boundaries outwards and effect change from within. This is especially important for artists who work with researchers in conducting data visualization, sonification, or other artistic presentations and embodiments.

Ideally, the artist should be an integral part of the research team from the inception of the project. Even if he or she does not possess expert knowledge of the research subject, an artist possesses the capacity to ideate and conceptualize complex concepts in ways that are both expressive and tangible. Artists can contribute to group discussions by sharing divergent perspectives, and they may be especially skilled in finding and identifying problems, taking unexpected multi-variable approaches to emerging challenges, and finding novel solutions to perplexing research dilemmas. The artist will gain a more comprehensive understanding of the research subject if he or she is part of the team from the start, making the task of visualizing/sonifying/embodying the data more likely to succeed.

Not all researchers realize that they might benefit from an artist's participation in their project until later on in the process, however. When the artist is consulted near the end of the

project, he or she is not always given credit for being part of the research team, but is mentioned, instead, as an illustrator (or similar role). This has little benefit for the artist and can be perceived as demeaning or exploitative. Becoming a so-called "visualization monkey" does not offer the artist substantive consideration towards career advancement in his or her own department in the same way that an exhibition or performance usually would, even if considerable amounts of time and energy have been poured into the project. Therefore, inclusion as a member of the research team is an important accomplishment for arts faculty because it broadens the scope of their professional profiles and enhances their reputation within the community of scholars.

To avoid potential pitfalls, both the researcher initiating the project and the artist invited to participate must be very clear about their roles and expectations, perhaps employing the Pre-Collaboration Interview Questionnaire found in Appendix 1. The artist must advocate for inclusion as a member of the research team rather than mention as an illustrator. Both partners should also meet with their administrators in order to reach an understanding of how this collaboration will be considered in matters of promotion or tenure.

As with curricular collaborations, having a fully-fledged plan in hand can be instrumental in gaining administrative acceptance. This plan should include the participants' best possible estimates of answers to the following questions.

Project Estimate[4]

1. A preliminary estimate of the project's scope and purpose
2. A schedule of meeting times, places, and work to be accomplished
3. An outline of each participant's responsibilities and duties
4. A list of other participants and their roles, including full contact information and professional profiles

[4] A fillable form for these questions is located in Appendix 2.

5. A list of required materials and equipment needed, itemizing supplies already on hand and those that must be acquired, including estimated costs
6. A project budget, including specific funding sources or proposals for securing funding
7. Other considerations unique to the project. For instance, a theatrical production portraying a concept in quantum physics will have different requirements than a project involving the creation of computer graphics to conceptualize a mathematical theorem.
8. A clearly defined schedule outlining expected execution of deliverables

Environmental Analysis

Once the partners have created a detailed plan to present to their administrators, they should work together to investigate the institutional structures and resources that might support or impede their proposed project. The following considerations should be addressed.[5]

Environmental Analysis

1) Have similar collaborations previously occurred at this institution?
    a) Who were the participants?
    b) Can we contact them in order to find additional information?
    c) Was the collaboration successful?
        i) If so, why?
        ii) If not, why not?
    d) What obstacles did the participants face?
    e) How did they overcome these obstacles?
2) Have similar collaborations occurred elsewhere?
    a) What can we learn from these?
    b) Who was involved?
    c) Can we contact these individuals to learn more about their experiences?

[5] A fillable form for these questions is located in Appendix 3.

3) What institutional supports are available to us?
    a) In my department?
    b) In your department?
    c) From other sources within the institution?
4) Which of our departments will be the home of our project?
5) To whom do we report our progress and/or findings?
6) What resources do we have available to us at present?
    a) Facilities and equipment, including specific locations and restrictions to access
    b) Departmental funding
    c) External funding
        i) What are the stipulations or requirements set out by the funding organization?
7) What can we expect from our departmental colleagues in the way of support, encouragement, or opposition?
    a) How will my work be evaluated by my peers?
    b) How does this differ from the way your work will be evaluated?

These questions differ from those in the Pre-Collaboration Interview Questionnaire, which focuses on the partners themselves, and they are also distinct from the Project Estimate, which centers on specifications of the work to be accomplished. Although the questions may appear to overlap, the purpose and focus of each document differs, and all of these issues should be addressed prior to beginning a curricular or research partnership.

Many other questions undoubtedly can and should be asked, but since each instance of collaboration will encompass a unique set of circumstances and involve participants with very different perspectives and expectations at different institutions, it is not possible to create an all-encompassing script appropriate for every circumstance. Instead, the questions above should

be taken as a starting point, priming the discussion between partners and leading naturally to a more complete development of a specific plan of action.

CONCLUSION: WHAT WE CAN ACCOMPLISH

Collaboration is challenging, but it's also very rewarding. Those who have engaged in successful collaborations point to numerous intangible or unforeseen benefits, including the growth of professional relationships between individuals who might not otherwise have had the opportunity to meet, not to mention working towards a common goal. By operating within existing disciplinary systems and beginning to collaborate before comprehensive institutional transformation becomes a present reality, we can accomplish these transformations one project or course at a time.

The phrase, "the landscape of higher education," is often employed metaphorically in describing differing planes of educational existence, but the use of this metaphor connotes differing physical geography, as well. All topography is not the same—that's why the world needs roads and bridges. We can build similar structures to allow us to connect uneven topography between previously siloed disciplines in order to make our collaborations successful. In the future, this may happen on an institutional level, but until then we can embark upon our own collaborations, enhancing our chances of success by engaging in careful planning that takes potential pitfalls into account before they can become insurmountable obstacles.

Significant progress has been made to change siloed learning environments, but the present system of higher education is built upon disciplinary boundaries, individual accomplishment, hierarchical structures and asymmetrical, discipline-specific expectations. Those who attempt to collaborate without recognizing these realities increase the risk that their projects will fail, or at very least falter—requiring adjustment and adaptation. However, a proactive and pragmatic approach that seeks to work within existing structures can increase the chances for success.

Planning for collaboration is crucial to success, and the tools included in this discussion should facilitate that planning and allow potential partners to navigate the terrain of boundary-crossing, allowing them to break free of disciplinary silos and expand scholarship and teaching beyond the confines of their primary departments. We know that the world outside academia demands collaboration, and these steps represent a starting point for those who will lead the way from within.

Appendix 1

Pre-Collaboration Interview Questionnaire

Pre-Collaboration Interview Questionnaire

1. What is my vision for this project? (*Be as specific as possible*)

_____

_____

_____

_____

_____

2. As I understand it, what is the scope and purpose of this project?

_____

_____

_____

_____

_____

3. How will the project be funded? *(If this has not yet been determined, what possible funding sources do you recommend?*)

_____

_____

_____

_____

_____

4. What do I hope to gain from this collaboration? (*Rank the following statements in order, with 1 being your most important motivation for participating in this collaboration. Select only those that are relevant to you.*)

_____ improved student learning

_____ improved pedagogical practice

_____ advancement of personal/professional research

_____ enhanced creative practice

_____ discovery of new knowledge that can subsequently enhance student learning

_____ discovery of new knowledge that can improve the quality of human life

_____ enhanced professional standing via publication

_____ enhanced professional standing via an exhibition or performance

_____ documenting achievement that can be applied towards promotion or tenure

_____ meeting an external requirement (department, institution, or third-party)

_____ enhanced status or recognition from/in/among: (check all that apply)

_____ my department

_____ the institution

_____ other scholars in my discipline

_____ enhanced institutional status

_____ competition with/emulation of peer institution(s), organization(s), or individual(s)

_____ direct financial reward

_____ other (please specify):_____

5. What is my availability? (*Input your weekly schedule below*)

	Monday	Tuesday	Wednesday	Thursday	Friday
8 a.m.					
9					
10					
11					
12 noon					
1 p.m.					
2					
3					
4					
5					
Evening hours					
Weekend availability (if any)					

6. What other commitments do I have that might impact or conflict with this collaboration? (*Ex: speaking engagements, upcoming professional conferences, upcoming performances or exhibitions, personal factors*)

_____

_____

_____

7. What are my expectations regarding our meetings and/or shared work sessions:
    a. Where will we meet? _____
    b. When will we meet? _____
    c. How often will we meet? _____
    d. How long will our meetings be? _____
    e. Who else should be present at our meetings? _____

    _____

    _____

8. Deliverables:
    a. What deliverables do you expect from me, and when?

    _____

    _____

    b. What deliverables do I expect from you, and when?

    _____

    _____

9. Though redundant, what is the written timetable and schedule for accomplishment of these deliverables?

    _____

    _____

10. What challenges or impediments do I anticipate?

    _____

    _____

11. How do I suggest we prepare for these challenges or impediments?

_____

_____

12. How will this collaboration enhance learning?

    a. How will my students benefit?

_____

_____

    b. How will your students benefit?

_____

_____

    c. What do you and I expect to learn from one another?

_____

_____

    d. How will our learning in the project impact our teaching and/or service?

_____

_____

13. How will this collaboration enhance the reputation or status of the college or university?

_____

_____

14. How will we ensure that this is an equitable partnership?

_____

_____

15. What are my preference for contact and communication? (*College/university email, personal email, text message, office phone, home phone*).

    _____

    _____

16. Do I want to set restrictions on contact methods or timeframes?

    _____

    _____

17. What other information do I feel you should know prior to entering into a partnership with me?

    _____

    _____

Appendix 2

Project Estimate

Project Estimate

1. A preliminary estimate of the project's scope and purpose

_____

_____

_____

_____

_____

2. A schedule of meeting times, places, and work to be accomplished

_____

_____

_____

_____

_____

3. An outline of each participant's responsibilities and duties

_____

_____

_____

_____

_____

4. A list of other participants and their roles, including full contact information and professional profiles

5. A list of required materials and equipment needed, itemized by supplies already on hand and those that must be acquired, including estimated costs

6. A project budget, including specific funding sources or proposals for securing funding

7. Other considerations unique to the project. For instance, a theatrical production portraying a concept in quantum physics will have different requirements than a project involving the creation of computer graphics to conceptualize a mathematical theorem.

_____

_____

_____

_____

_____

8. A clearly defined schedule outlining expected execution of deliverables

_____

_____

_____

_____

_____

Appendix 3

Environmental Analysis

Environmental Analysis

1) Have similar collaborations previously occurred at this institution?

_____

_____

   a) Who were the participants?

_____

_____

   b) Can we contact them in order to find additional information?

_____

_____

   c) Was the collaboration successful?

      i) If so, why?

_____

_____

      ii) If not, why not?

_____

_____

   d) What obstacles did the participants face?

_____

_____

   e) How did they overcome these obstacles?

_____

_____

2) Have similar collaborations occurred elsewhere?

   a) What can we learn from these?

   _____

   _____

   b) Who was involved?

   _____

   _____

   c) Can we contact these individuals to learn more about their experiences?

   _____

   _____

3) What institutional supports are available to us?

   a) In my department?

   _____

   _____

   b) In your department?

   _____

   _____

   c) From other sources within the institution?

   _____

   _____

4) Which of our departments will be the home of our project?

   _____

   _____

5) To whom do we report our progress and/or findings?

   _____

   _____

6) What resources do we have available to us at present?

   a) Facilities and equipment, including specific locations and restrictions to access

   _____

   _____

   b) Departmental funding

   _____

   _____

   c) External funding

   _____

   _____

      i) What are the stipulations or requirements set out by the funding organization?

      _____

      _____

7) What can we expect from our departmental colleagues in the way of support, encouragement, or opposition?

   a) How will my work be evaluated by my peers?

   _____

   _____

   b) How does this differ from the way your work will be evaluated?

   _____

   _____