Responsible Conduct of Research:
Collaborative Research

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Introduction

- Over the last two decades or so, scientific and technological advances have changed the knowledge base in every area of human knowledge.

- This change has in turn changed the research environments making it impossible to work in a single specialty. This module focuses on collaborative interaction amongst universities.

Introduction

Factors contributing to the rise of collaborative research include:

- Research has become interdisciplinary.

- The knowledge base has changed.

- Research has become international with more countries investing in research as national strategies with funding agencies providing more funds for international research.

- Large volumes of data (Big Data) are being generated which requires specialists from multiple disciplines to collaborate in analyzing the data and using the data beneficially.

- Collaborations are easier to develop and sustain than they were before.

What Collaborative Research Means

Collaborative research can be defined as research that is conducted by more than one researcher, or research team, either within their institution or with colleagues in other institutions.

As sciences become increasingly interdisciplinary and multidisciplinary, collaborations become increasingly necessary to get the work done.

Establishing Collaborative Relationships

Successful collaboration requires that:

- all participating members work together towards a common goal that has been agreed by all parties.

- Each member of the team is considered an important part of the team and that they understands their role and the expectations from their activity.

In addition to a common goal and scientific competency, good collaboration is based on building a relationship that is based on trust, respect, good communication, and the ability to compromise.

Establishing Collaborative Relationships

Like any other agreement there are details that need to be considered and agreed upon prior to the start of work to make the project beneficial for all parties involved in the collaboration.

- What are the common goals?
- What is to be exchanged through the collaboration?
- How will the work and any products be shared?
- How will any funds available be shared and spent?
- How is responsibility (i.e. who does what) and credit (e.g. publication) shared?
- What are the timelines for each goal?

Collaboration

Roles and Responsibilities

It is important to have a clear understanding and agreement on the roles and responsibilities of each member participating in the collaboration. This should include a clear understanding of the:

- *Leadership*: There should be a clear understanding by all collaborators as to who is ultimately responsible for leading the project and *what are the powers vested on this individual*, or individuals if there are co-leaders.

- *Team Members*: similarly there should be clearly defined roles and expectation for each team member. The specific roles would depend on the scope of the project as well as the expertise of the individual.

Communication

Communication amongst the team members is one of the most important factors in successful collaboration.

- Communicate often and early throughout the project.
- Establish a formal communication structure for reporting on the progress, discussing problems or challenges, etc.

A key component of your communication strategy should include the notification of team members if you encounter any problems or challenges in completing your part of the task as soon as possible.

Negotiating Collaboration Agreement

Negotiating agreements is essentially the art of compromise.

In addition to your research goals there are other institutional and regulatory requirements that each participating team has to address.

When negotiating agreements it is best to address as many of the critical elements *prior* to starting the project; postponing issues on which there is considerable disagreement to a later date is unlikely to be resolved easily.

Discuss Authorship Plans

Discuss issues related to publications arising from the collaborative research in advance and document the agreements. These may include:

- The right to publish (including thesis publications)
- Who writes what
- Who makes presentations of the results (e.g. in conferences)
- The order of the authors
- Acknowledgment of those who are not authors but have contributed to the research
- etc.

Intellectual Property Rights

Intellectual Property (IP) rights are complex and specifics vary from one institutions or country to another. It is extremely important for the collaborators to discuss the IP issues with the responsible individuals at their institutions before entering into, or starting, a collaborative research to make sure that their rights are protected.

The session on Intellectual Property Rights (IP) will cover the topic in more detail.
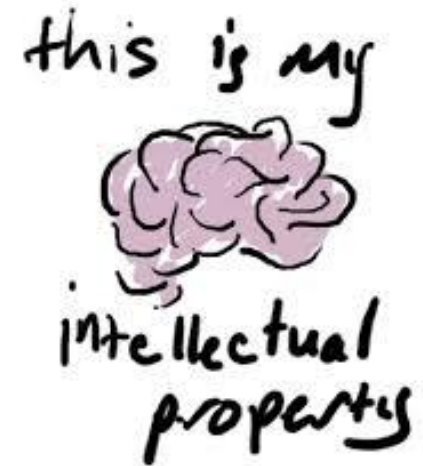
Data Management, Sharing, and Ownership

Many institutions have specific data ownership policies that assign the overall ownership of research data to the institutions. It is therefore, important that the collaborators discuss and reach an agreement in advance on the details of:

- How data is collected and managed to ensure their integrity.
- What is the ownership of the data (i.e. who owns what data?).
- When and how is data shared amongst team members.
- Data security plans.
- Electronic data back-up;.
- Software used to record or manage the data.

The session on Data Management provides more details on the topic.

Conflicts of Interest

The research team members should clearly disclose any potential conflicts of interest that may have, or may be perceived as having, influence on the integrity of the research and the data generated.

The session on the Conflict of Interest provides more details on the topic.

Facilities, Equipment and Supplies

- A collaborative agreement should clearly define the contributions of each member, or team, in terms of supplies, equipment and facilities.

- Each collaborator, or team, should be realistic on the availability of facilities and equipment and consider other active, or planned, projects using the same facilities or equipment.

Conflict Resolution

Conflicts, major or minor, may arise during any collaborative projects due to :

- Different styles and personalities of the individuals involved.
- Different approaches by different specialties in a multi-disciplinary research project.
- Challenges encountered during the project and their causes.
- Inadequate communications.
- Pure misunderstanding.

Conflict Resolution

- While most formal collaborative agreements include terms and conditions on how contractual conflicts will be addressed, they generally do not include provisions on how these types of conflicts will be resolved.

- Options for addressing these issues vary and is dependent on the preferences of the project leadership and can range from an open forum to appointing a conflict resolution leadership team

Regardless of the approach taken, it is important that there is clear understanding in advance and that all individuals involved in the research are fully aware of the process.

Institutional and Regulatory Standards

- Regardless of the nature or scope of a collaborative project, there are specific regulatory and institutional mandates that are often dictated by the funders of the research as well as national regulations.

- This issue is especially important in international collaborations where country specific regulatory mandates may differ significantly.

- Often times the participants are required to adhere to the stricter regulation.

Tips for a Successful Collaboration

- A good collaboration can be ruined by:
  - Misunderstandings about the role or expectations of each participant.
  - Unhappiness with a slow collaborator.
  - Disagreements about interpretations of data.
  - Conflicts about authorship.

- A successful collaboration is based on working with colleagues to achieve a shared goal and be able to navigate the complications of any social interaction.

Tips for a Successful Collaboration

The following quotes are from a number of colleagues, whose careers have included many successful collaborations, in response to the question of "what were your secrets for a successful collaboration":

- It is hard work and you have to constantly monitor the interaction and make sure you are responsive to your colleagues needs.

- Take time to learn the academic, discipline specific, institutional or national culture of your collaborators, and respect the differences!

- Treating everyone as equal and giving to credit to all for the work.

Tips for a Successful Collaboration

- Communication, communication, communication; mainly listening!
- Ability to recognize when everything is going right and praising the contributors; and when things are not going well, bringing the issues up for discussion without blaming anyone for it.
- Being honest about what you can do and what you need your partners help in.
- Always remember why you are collaborating with someone: you have a shared goal in solving a problem; each of you have skills, intellectual capital and resources that is being brought to the collaboration to solve the problem; and you are a team.

Tips for a Successful Collaboration

- Clarify what the roles, responsibilities and expectations of each team are, and regularly check on the progress; be flexible to make changes if they are needed.

- Be democratic, ask for input from all; but when needed make a decision!

- Before starting a collaboration make sure you and the potential collaborator have a common goal, generally agree on how to achieve you goal, and that both of you consider this as a partnership. Many collaborations fail, because the main reason people participate in it is availability of funding; I have never joined a collaboration because there is funding available!

Final Thoughts

- The benefits of collaboration are undeniable, and collaboration is in the best spirit of science.

- Establishing a collaboration can leave scientists vulnerable to the actions — or inactions — of their collaborators. In choosing collaborators, trust and credibility are essential values.

- Choosing collaborators must be based not only on scientific considerations, but also on the likelihood of a respectful, even amicable, relationship in which lines of communication can be kept open.

Together Everyone Achieves More

Resources

- Culture Matters: International Research Collaboration in a Changing World--Summary of a Workshop. http://www.nap.edu/catalog/18849/culture-matters-international-research-collaboration-in-a-changing-world-

- Collaborative Science. http://ori.hhs.gov/education/products/columbia_wbt/rcr_science/foundation/index.html#1

- Overcoming Barriers to Collaborative Research. http://books.nap.edu/openbook.php?isbn=0309067847

- Collaborative Research. http://ori.hhs.gov/education/products/niu_collabresearch/collabresearch/crintro.html