Chapter 4

Research Management, Ethics and Culture

A research university focuses on research, and hence must promote and support research not only as part of its mission but also operationally. However, unlike education, which is a collective responsibility and effort of the university, research is largely done by small groups of faculty along with their students. Consequently, the role of the university is more about facilitating research. Towards this end, all research universities have management units for research—some large universities may have elaborate structures and multiple units looking after different aspects of research promotion and management. In this chapter, we will look at the key aspects of managing research in a research university. We will discuss research management at an institutional level, and not those elements of research management that are done by researchers themselves. (It should be appreciated that a considerable amount of research management is actually done by the faculty and staff executing research projects, usually within the frameworks defined by the institute-level research management (Kirkland 2008).)

The main goal of research administration in a university is to increase the volume and quality of research, especially sponsored research. For this, it has to perform key functions such as developing a strategic research plan, promoting sponsored research grant management and research advancement, providing research

infrastructure, promoting the research done, etc. (Johnson 2013). We will discuss these in the next section. The research administration also needs to provide support for the commercialization and use of research in the society. We have discussed this aspect, which has become increasingly important, in more detail in the chapter on the third mission (Chapter 5).

Another function of the overall research management in a university is to provide support for research ethics and ensure that they are being followed. This is naturally a crucial aspect of conducting research involving live (human, animal and plant) subjects. Ethics has become increasingly important even in areas such as technology, as technology impacts all aspects of life and often has undesirable uses. Also, research sponsors often require that the ethical practices of research are strictly followed. We will discuss research ethics later in this chapter.

Finally, research thrives if a university can develop and support a culture of research. We will discuss this vital aspect also later in this chapter.

4.1 RESEARCH ADMINISTRATION

Research administration covers all aspects of managing and promoting research in a university. The funding in most research universities comes from sponsored research projects. Hence, providing support for managing such projects is a major goal of mainstream research management. Besides research projects, research universities often have research centres—these are entities that have focused research goals, which are sometimes interdisciplinary. Research centres may last for decades. They may have been created through some grants, but once created, they are the responsibility of the university and have to be supported till they are closed.

While providing support for projects and centres, the research administration should also proactively advance research. The goal is to promote high-quality research and research excellence and

to help get more sponsored projects. This involves identifying emerging areas in which a research university should take a leadership role, obtaining funding for it and planning to develop it. Research administration should also promote the research done in the university among external and internal stakeholders, which indirectly helps the cause of research advancement.

Finally, the administration needs to provide a suitable infrastructure for research, which can be anything from space for labs, to high-performance machines, to digital libraries, and so forth. The administration can also support researchers in tasks necessary for the main research for which the faculty member may not have the expertise, for example, programs to be written to analyse data in a particular manner for some medicine-related research.

Universities also have to organize their research management structure suitably. We have not discussed this aspect here. The literature is available on this aspect. For example, how an organization managing university research might be organized and what might be suitable research management structures are discussed in Huong Nguyen and Meek (2015). Similarly, some issues related to managing research are discussed in Mintrom (2008). The OECD has also produced documents on this topic (Connell 2004; Hazelkorn 2005).

4.1.1 Strategic Planning

One of the responsibilities of the research administration is to develop a strategic plan for research (Bushaway 2003; Kirkland 2008). However, unlike a corporation, where research may be goal-driven and the research team can be asked to work on stated goals, in academia, the administration has no real authority to guide faculty members on the type of research they should pursue, and there are often no end goals for research other than generating new knowledge. Hence, all types of research have to be encouraged. In other words, there is an inherent tension between academic freedom and any centralized planning for research. Hence, the role of strategic planning is limited.

Although it is challenging to evolve a suitable and actionable strategic plan for research in an academic institution, not having a plan may lead to missing opportunities for getting research funding or becoming a leading player in some area.

At the institutional level, the main goal of strategic planning is to help an institution become a leading research centre in specific areas, which helps build its prestige, something that every university seeks. This goal often translates into plans for the establishment of research centres and groups in some areas where the university has some advantages and which are important areas.

In an established university, a new initiative for research is generally based on the availability of some talent in an emerging opportunity for research. For example, it may be that some existing faculty are working in an area that becomes more important, with more funding available. In such a situation, the university may wish to bring such faculty together to form a group and augment the faculty suitably. At other times, the university may plan to enter some new areas of research and then recruit some senior people to drive research in those areas—this may also require establishing new labs or centres or even departments in some emerging disciplines.

Strategic planning may also be opportunistic. For example, a university might be able to attract a senior faculty who has a well-established reputation in an area. In such a case, the university can develop the area around the senior faculty and include it in its strategic vision.

A basic strategic research plan is to identify a few emerging areas with some advantages for the university, for example, location, availability of talent, proximity to an industry, and so forth, and then plan to establish centres or groups in those areas. This plan has to align with the plans of the different departments involved. The plan may include providing and pursuing some seed funding for the group or centre from the government or from other funding agencies. The plan has to be reviewed

periodically to ensure that it remains cognizant of the emerging opportunities.

Often, research groups for specific areas in a discipline are established within departments. However, at an institutional level, often, centres are set for significant research initiatives. These centres usually work on some problem areas which require multidisciplinary research. Thus, they become a unit that brings researchers from different departments together to work on the said problems. Often, incentives are provided to faculty with respect to PhD students, grants, support, and so forth, to contribute to the centre's research goals. Research centres are particularly useful for leveraging faculty strength from multiple departments to create an entity focused on some research areas.

A research university, therefore, needs special mechanisms to start research centres and operate them, as often, centres employ people who are neither university employees nor working on a project. A centre typically is provided some physical space and has a few administrative staff and a centre head, which makes its management quite different from the management of a typical project. This gives rise to a host of related issues—source of funding, motivation and incentives for the faculty to work in the centre, and so forth. If a certain source sponsors a centre, as is often the case for starting a centre, there must be plans to support the centre after the funding runs out, as such funding will typically support the centre for a few years. A research university must have specific guidelines for managing centres.

It is desirable to have the possibility of closing centres, perhaps when the research theme of the centre ceases to be an important research area. For this reason, most universities do not have regular faculty positions in the centre, but faculty are recruited from within the academic departments and participate in centres. Therefore, the space allocation for centres should normally be for some duration and should be reviewed after that. This can prevent situations wherein some old areas, though unimportant, with not much funding, still occupy space and the centre continues to exist.

4.1.2 Securing and Managing Research Projects

No research university can survive without successfully and aggressively competing for and getting research grants from various national and international agencies that provide funds for research. Most research-sponsoring agencies expect a central unit in a research university to serve as an interface through which they can monitor the appropriate use of funds. All research universities necessarily should have such a unit for managing research projects. In India, this unit is often the office of Dean of Research—also sometimes called Research and Development, or Innovation, Research and Development (IRD).

The IRD management needs to provide support for different phases in a project cycle (Kirkland 2008). The most fundamental support is to help prepare proposals with a suitable budget and submit them to a sponsoring agency. If a project is approved, the research management needs to provide necessary support for receiving funds and ensure their proper use, compliance with all regulations and submission of necessary reports, including the final project closure report, to the agency.

Sponsored projects are the main source of research funding, and in many universities, the overall sponsored project revenue may be as big as a quarter or more of their total yearly expenditure. The rules for the use of these funds are sometimes different from those of regular university funds. Also, the financial authority of approving the use generally rests with the principal investigator (PI) of the project. Therefore, the office of research usually has a separate accounting system and balance sheet, with dedicated staff for managing funds and accounts.

The support includes systems that can assist faculty in applying for projects and also facilitate the execution and closure of projects. Some of the requirements are:

- **Identifying project opportunities:** Often, calls for proposals are floated by agencies on their websites; faculty are not expected to monitor all such websites. The IRD unit should keep track

of all such opportunities as they emerge and keep the faculty informed.

- **Facilitating proposal preparation and submission**: Although the PI is responsible for preparing the proposal, the IRD unit can help in various ways. For example, the IRD unit should save a copy of earlier proposals funded by different agencies and use them to prepare new proposals. Also, frequently, proposals may need some general information regarding available facilities, university support and administration. The IRD unit can also provide these standard details. Policies for many items are generally decided at the institutional level. The IRD unit can help in the budgeting and appropriate costing of these items.
- **Providing flexible support to execute projects**: Project execution, which is the responsibility of PIs, may require recruiting staff for the project, purchasing equipment, arranging meetings, scheduling visits, and so forth. All these activities require efforts. If the IRD unit supports the PIs in these activities, PIs can focus more on the actual research. The IRD unit can further support PIs in ensuring that the funding agency conditions are met, if there are any.
- **Helping in smooth project closure**: All projects close after their predefined duration (typically 1–3 years). Closure requires a host of activities, such as making the closure report, closing the account and balancing the funds, taking care of the equipment purchased during the project, and so forth.

All these are standard functions performed by different universities in their own way. We will not discuss them further.

4.1.3 Research Advancement and Promotion

The purpose of research advancement is to take initiatives to advance research in the university. One way is to seed research in some upcoming area, where either expertise in the university does not exist currently or research funding has not yet started in that area. Universities are keen to work on futuristic problems;

in fact, often, these problems are exciting and offer possibilities for new achievements. Often, funding for such emerging areas is lacking. Hence, a university may start some initiatives to get some faculty interested in these areas and develop research groups and leadership so as to tap research funds and projects when (and if) funding becomes available.

Research is no longer a solo effort, given the vast knowledge that already exists, the complexity of problems and the need for faster knowledge creation. Hence, a critical mass of researchers must work on defined problem areas to make a mark in a shorter time. Forming research groups for problem areas is a proven method for making substantial contributions—multiple faculty working in similar areas along with their students form this group. A university can try to form research groups or labs in emerging areas by bringing related researchers together.

When taking this proactive approach towards research by identifying some research directions to pursue, often, such directions may require interdisciplinary effort. In such cases, besides providing initial support, the university may also facilitate matchmaking across departments so that complementary strengths can be pooled for forming a strong interdisciplinary team suitable for the chosen area.

A university can follow a similar approach even if it does not currently have expertise in an area that it considers important. In such a case, the university may invest funds and recruit faculty already working in that area. Further, the university can help some existing faculty members to migrate to or include this research area in their portfolio by providing them suitable support. With such initiatives, a new research group can emerge which can then bid for research funds.

These top-down approaches can be complemented with bottom-up approaches in which faculty can be asked to submit proposals for emerging areas or interdisciplinary work, particularly where some funding at an initial stage can help them reach a level where they can submit proposals to funding agencies.

Promising proposals can then be provided with some seed funding. Many universities have such funding programmes; the expectation is that some research proposals will be submitted to funding agencies as a result of the seed funding.

A research university needs to promote excellence. Though most research ends up making a modest contribution, if mostly mediocre-quality work is done, it is almost impossible to make a mark. Given the size of the research enterprise and the growing competition globally, as an increasing number of countries and universities are improving their research capacities, a university must have excellent research output to be noticed. Far too often, administration systems are geared towards the output, including papers published, and so forth. However, the goal of excellent research is actually to have an impact—impact on the body of knowledge or impact on the society, directly or indirectly, through the transfer of technology. Research advancement can support efforts for impactful research.

Another aspect of research promotion is to build industry partnerships leading to collaborative research on problems of interest to industries as well. This approach has been successfully employed by many universities in Australia, USA and elsewhere. However, these partnerships are not easy to build. Industries are preoccupied mainly with their business development. Their research needs are likely to be short-term in nature—opposite to academic research needs, which are long-term and more conceptual in nature.

For collaborating with industries, multiple approaches should be tried. Any progress in this direction can only be made if both sides acknowledge and accept each other's value systems and aspirations, identify common areas and problems that they can work on and develop mechanisms that facilitate the research, while working within the constraints of both sides. The most obvious approach is to have regular sponsored research projects from the industry. Another approach is to get into arrangements between a company and a university for funding research in certain areas,

with some agreement about the intellectual property sharing. There are also models of industries supporting PhD and master's theses on specific topics, which can provide low-cost engagement to industries. Collaborative centres with industry, particularly if there is support in terms of matching grants available (as in the Industry-University Cooperative Research Centers (IUCRCs) in USA [Berman 2012]), is an excellent way to engage in long-term collaboration with industry.

The goals of research are helped if the research being done and its impact are visible to the society and various stakeholders. In other words, for advancing research in a university, the research done in the university has to be promoted. Promoting research is therefore another function in which the goal is to promote research done in the university externally among the public and other stakeholders, as well as internally among its faculty, staff and students. This can be in the form of newsletters, media posts, advertising, social media drives, and so forth. This function is sometimes handled separately.

4.1.4 Research Infrastructure

Clearly, research universities need to provide a strong research infrastructure. While funding and specialized equipment for research projects may come from research grants, researchers and funding agencies expect universities to have a strong and facilitating research infrastructure. The research infrastructure is essential to ensure that even areas that do not get sufficient funding from sponsors but are of interest to some faculty are supported. Most universities focus on broad-based general research infrastructure while relying on sponsored projects to get specialized facilities needed for specific projects. Some of the basic research infrastructures include the following:

- Computing and networking infrastructure, including high-performance computing;
- Library with journal subscriptions, books, etc.;
- Support for international connections and collaboration;

- Policies to support research; and
- Seed funding for research.

Another support that scientists often need is software support for their research project, which is different from IT support. All disciplines need various kinds of software support to do the work and answer their research questions—developing some software scripts for data processing or visualization, configuring some software systems, developing websites, and so forth. Researchers can focus on the main research questions if they are supported in all their software needs, as software development is often challenging for people from non-engineering fields. An example of this kind of support is the e-research unit of QUT in Australia.

Support for intellectual property (IP) management and commercialization is another area that has become increasingly important for universities. There is now an increased desire that while research generates new knowledge, where possible, the knowledge should be applied for the betterment of societies and peoples also. Commercialization of IP and its management needs support in terms of filing patents, protecting them, getting into IP-sharing arrangements with companies, and so forth. However, these are complex issues involving lawyers and dedicated IP management units. This aspect has been further discussed in the chapter on the third mission (Chapter 5).

Here it will be good to separate generating value, and benefitting from this value. Given the financial needs of a university, it may be important for a university to benefit from the value that may be generated from the research done at the university. At the same time, as a university is involved primarily in generating knowledge as a public good and is often supported through public funds, it can also be argued that the main goal of a university should be that the knowledge it creates must generate value for the society. This is different from the goal of new-knowledge creation by a company. A company is interested in generating value for itself, though it may also generate value for the society. For a university, it should be the reverse—the main goal is to generate

value for society, and where possible, this value generation should also benefit the university financially. These two factors will have to be balanced by a university in its policies regarding the commercialization of the IP it creates.

4.2 RESEARCH ETHICS

Research is the pursuit of creating new knowledge through systematic inquiry. Ethics provides guidelines regarding what actions in the pursuit of knowledge are proper. Hence, ethics guides researchers and also provides the philosophical framework for universities to evolve their guidelines for their faculty, students and staff involved in research.

Ethics, in a very general sense of the term, refers to the study of what ought to or ought not to be done. It can consist of guidelines regarding right actions or decision-making. Research ethics is a form of applied ethics, that is, the study and formulation of guidelines for ethical behaviour in the context of research. Research ethics can define parameters and standards that will help researchers strive to maximize benefits and minimize harm in research activities (Anderson and Corneli 2018).

Ethical conduct of research is also commonly referred to as responsible conduct of research. Responsible conduct of research (RCR) is 'simply conducting research in ways that fulfill the professional responsibilities of researchers, as defined by their professional organizations, the institutions for which they work and, when relevant, the government and public' (Steneck 2006). For the responsible conduct of research, a way to view ethics is that it raises issues for the research project along three dimensions: (a) truth or scientific integrity; (b) fairness with respect to colleagues, subjects and the institution; and (c) wisdom or social responsibility for conducting the research (Pimple 2002). These three dimensions can be further divided into multiple domains.

A host of ethical issues come up when research uses human and other living subjects, and there is a risk of harm to the subject,

for example, in medical research or some types of social science research. This is a big issue in itself—there are guidelines in countries on how human or animal subjects should be used for such studies, and there are books and articles which discuss them. Many of the dimensions relating to fairness fall in this category (Pimple 2002). We will not discuss this issue, other than saying that if living subjects are involved, a strong compliance with suitable frameworks should be the norm.

Research ethics can also be viewed as having two aspects—procedural aspects that deal with the processes to be followed for approvals, etc. and ethics in practice, which deals with issues that researchers face during their research (Guillemin and Gillam 2004). We focus on the practice aspects here and discuss some research ethics issues in the three main stages of research, namely, research problem formulation, execution of research and making claims and publishing research results. We then briefly discuss mechanisms a university should employ to support ethical research. For a deeper discussion on many of the issues, we refer the reader to Koepsell (2015).

4.2.1 Research Problem Formulation

This is the first stage of research—formulating a research question and planning the methodological stances that one would adopt to seek an answer to that question. In general, any question could be a research question if there is a good enough justification that it is 'research-able'. But there has to be an additional dimension to this stage of question formulation: Is the research in itself ethical? For example, it might sound interesting to a researcher to explore the hypothesis that states 'the number of girls in engineering colleges is less due to their poor math skills', but this research question formulation in itself is based on a gendered assumption of different intellectual abilities. Is that ethical? Does it carry the potential of misrepresenting a specific section of the society?

The main ethical issues that arise during this phase of research include:

- **Formulation of research questions or hypothesis that is fair and unbiased and is not intended to harm subjects**. This is the key issue while conducting research, and it relates to the social responsibility aspect of research. History has shown that, often, research questions are formulated in a manner that is not neutral and which leads to biases against groups (e.g., a question about whether people of some races have lower intelligence).
- **Methods or instruments used for answering the question**. It is the ethical responsibility of the researcher to ensure that the method used does not have inherent limitations or biases which can result in incorrect results. For example, the intelligence quotient (IQ) test used earlier to study the intelligence of people was itself shown to be biased against some groups of people. This issue is also related to scientific integrity.

While research in itself is a search for answers, it may or may not be beneficial for mankind to pursue some research questions. In such a case, while a scientist is clearly within his/her rights to pursue a question in the pursuit of science, he/she is faced with an ethical issue of whether it is worth pursuing (social responsibility dimension). There are many research questions that a scientist may have, but he/she pursues only those which according to his/her view and priorities are worth pursuing—this may be based on the possible impact, availability of funding, personal liking of the problem, etc. For research questions whose outcomes may harm mankind, the 'worth' question should also be asked from an ethical perspective.

4.2.2 Execution of Research

Once the research problem and questions are determined, the researcher may gather data pertaining to his/her research concerns. The data might be gathered through performing experiments involving subjects, compiling data from different sources, monitoring systems or people, etc. Then the data is to be analysed to obtain knowledge, which can be extracted. There are many

ethical issues that come in during this phase of research. Some of the key ones are:

- **Use of human subjects.** Human subjects are also used in studies that have 'minimal risk of harm', for example, administering a questionnaire to study the habits or preferences of people. For such research also, research ethics dictates that some guidelines should be followed. This issue relates to the fairness dimension. We discuss some of these.

  Such research projects should follow a protocol which requires 'informed consent' by the human subject, that is, an acknowledgement that the human subject is fully aware about the research and the potential consequences of him/her participating in the research as a subject. Respondents should also be made aware of the rights they have as participants of the study. They should be informed about the possible steps of following up on how and where data/information extracted from them would be used.

  Another general guideline is that of privacy. The identity of the person should be kept hidden, and in no way should the privacy of the individuals be violated. Moreover, confidentiality of information/data gathered from the participants has to be ensured. Breach of confidentiality or sharing of information with third parties (not involved in the study) is a serious breach of research ethics.

  While the research may have minimal risk of direct harm, there may be other types of impact on the subject, for example, emotional, psychological, economic or interpersonal. Some psychological harms—sadness, embarrassment, anxiety—may be caused by the way data is collected. Other types of harms—breach of privacy, economic harm, harm to dignity—may occur if the researcher does not respect the will of the participants in terms of confidentiality of identity and data. It is important to identify the possible risks, consider the likelihood and magnitude of the risks and determine methods to minimize them. Further, the risk should be clearly explained to the subjects as part of informed consent.

- **Use of publicly available data**. There is currently a lot of data available on various platforms, which reveal much of it to the public. It is known that by combining data from various platforms, it is possible to find out more about a person—perhaps much more than what the person intended to make public. Should such data be inferred and made available? In such situations, an ethical response is that if the data reveals more than what the person had intended, then the consent of the person should be sought.
- **Fabrication or falsification of data**. A lot of studies start with some hypothesis that has to be established through data. Sometimes, some of the data that is collected (as a result of experiments or other data-gathering exercises) does not fully fit the hypothesis. If there are some data points that are 'the culprit', it is tempting for the researcher to ignore the data in order to prove the hypothesis, or worse, 'adjust' the data so it suits the hypothesis. The worst case of this is when data is not obtained but manufactured artificially to prove the hypothesis. All such falsifications or fabrications of data are clearly unethical. The ethical response should be to let the data speak for itself and not manipulate or manufacture it in any way, and if any data points are omitted (as outliers or special cases), this should be made clear when making research claims. In this discussion, data does not just refer to tables and numbers—an image is also data, and modifying images is also data manipulation.
- **Responsible management of the side effects of executing the research**. Research may result in waste. While not central to the research being pursued, it is the responsibility of scientists to ensure that waste and other side effects are managed properly.

4.2.3 Publishing Research Results and Claims

The final stage of research involves communicating one's findings with the larger academic community. Of course, there are possibilities that there might already exist research dealing with

the same subject matter as one's own. There exists a proper procedure of acknowledging such prior works in one's own writing. Claiming someone else's finding as one's own is a serious ethical breach, and every researcher needs to be wary of it. Having said this, it is also a matter of concern that many a time, such incidents of plagiarism happen due to lack of awareness. Researchers require proper training on legitimate procedures of quoting and citing other research writings without coming under the risk of penalization for their own work being judged as plagiarized. There are many issues relating to communicating research results and making research claims. Some of these are:

- **Publication ethics**. There are some general rules which researchers are expected to follow when submitting their work for possible publication in a journal (of conference). The first is that the research paper should not be submitted to multiple journals at the same time—the ethical behaviour is to submit it to one place at a time. Second, the research paper should not be a 'rehash' of older works but should contain substantially new results. Third, the authorship for the paper being submitted should be claimed by those who have contributed significantly to the research results being reported and their writing. While the first two can possibly be checked by journals, the third issue can only be ensured by the researchers/authors; this is also an area where, perhaps, violations are more common (it is known that some names are added in the author list—generally known as ghost authors—for extraneous reasons).
- **Plagiarism**. This is perhaps the most common violation of ethical standards. The plagiarism violation has a few different aspects. The first is what we will call as text plagiarism—picking up text (or a diagram, photo, etc.) verbatim from an earlier publication without permission and without attributing it to the source. This also often violates the legal copyright provisions. The second is what we will refer to as concept plagiarism—some earlier published ideas are used without giving credit to the original authors. The worst form of this

is when the main ideas or results in the paper are plagiarized but are claimed to be the author's own (e.g., an idea in a paper published in Russian/French is used by an author in a paper written in English, who claims it as his own). Finally, there is the concept of self-plagiarism—in this, text or ideas published earlier in works by the current authors are used without properly attributing them to the original publications. Most journals have clearly stated policies regarding plagiarism, including what actions it may take in case plagiarism is detected (e.g., guidelines by Nature).

- **Authorship and credits**. Researchers involved in a research need to ensure that in their paper, credits are given suitably. Any person who contributes significantly to a paper/research needs to be acknowledged as an author, while those providing minor support can be mentioned in the acknowledgements, and persons who have not contributed significantly to the research should not be listed as authors (this aspect is often violated, where a 'head' or a 'senior' person's name is added even if the person has not contributed to the research). The order of authorship—first, second, third or guest—has to be based on mutual consent among all the contributors involved. This holds true even if the contributor is a student.
- **Overclaiming and not clearly explaining the limitations**. Most often, research results are valid only in some circumstances. As an ideal for a researcher is to get general results that will hold true in a large range of circumstances, there is often a tendency to make larger claims than reasonable. It is the ethical responsibility of the scientist to not make an overgeneralized claim and clearly explain the limitations of the results and the assumptions made while conducting the research.

4.2.4 Institutional Mechanisms for Supporting Ethical Research

While it is the responsibility of the researchers/scientists to ensure that they follow the ethical guidelines of their profession and follow the standards/frameworks, it is the responsibility of the university (or the organization the scientist works for) to provide

support for this. In addition, there are some issues that a scientist cannot himself/herself determine, as there might be a resultant conflict of interest—for example, if an experiment they want to conduct with human subjects is acceptable or not. In such cases, there is a need for an approving body, which can ensure that approval for a research is given only if it complies with their standards and there are no violations of the ethical guidelines. These committees are generally referred to as institutional review boards or IRBs. IRBs are present and functional in most research-based institutions to ensure that research is conducted safely and ethically.

The task of an IRB is to review, prior to its initiation, all research involving human participants. It has the authority to assess, approve, disapprove, monitor, make suggestions for or request changes in a research work per the ethical standards of the institute. The IRB usually has a few members from varying backgrounds to review a research's institutional, legal, social and scientific implications. For taking a holistic and unbiased view, the IRB should contain some scientists but also some non-scientists and someone with no affiliation to the institution. The requirements of a sound IRB composition are different in different countries.

Besides the IRB, an institution also needs mechanisms to investigate claims of unethical behaviour that might be brought to its notice and, based on the investigation, determine responsibility and recommend a course of action. Universities generally use committees for this purpose—often constituted based on the nature of the claim.

4.3 BUILDING A RESEARCH CULTURE

Universities have a culture that distinguishes them from other organizations, and the foundation of this unique culture rests on the unique missions of the universities—knowledge creation and dissemination. This culture is a shared set of values and beliefs that are taken for granted and which help the university faculty in

defining who they are, what they are expected to do, the purpose of their work and how their community is different from others (Silver 2003). From this notion of culture, we can say that the research culture of a university refers to the set of shared beliefs, values, attitudes, practices, customs, etc. of the institution that support and promote research. The set of beliefs includes the views of faculty regarding levels of support for research, time for doing research (i.e., teaching load must be modest), importance of research in promotion, type of research expected, social norms in the university, etc. (Pratt et al. 1999). A supportive and thriving research culture is indispensable to achieve excellence and higher research productivity. All other things being equal, the universities having a strong culture of research will be more productive and conduct more impactful research than others.

The research productivity of researchers is influenced by their own capabilities and motivation and traits but is far more impacted by environmental factors (Bland and Ruffin 1972). Studies have shown that even very productive researchers become less productive if they move to environments that are not conducive to doing high-quality research. A study identified various environmental factors that affect research productivity. These include: clear goals and their communication, an emphasis on research, *culture*, group climate, participative and decentralized governance, leadership, etc. (Bland and Ruffin 1972). The NEP of the Government of India also recognizes that besides lack of sufficient funding for research, there is also a lack of research mindset and culture, which does not encourage the best minds to take up careers in research. It suggests that a basic goal of the national research foundation to be established should be to promote a culture of research in universities, besides providing funds for research in universities (NEP 2019).

Building a research culture is a concept involving social processes which are influenced by individuals and the past. Hence, it is hard and involves time and sustained efforts. Further, it requires commitment from all members of the university, particularly the faculty, PhD scholars and the leadership. Preserving and

strengthening the research culture is even harder and also needs continuous effort and care. There are many examples in India and across the world where a flourishing research culture degenerates to one where mediocrity thrives. The various structures and stakeholders of the university have to be vigilant to preserve the culture and avoid the temptation of taking expedient steps and decisions that may avoid immediate unpleasantness but can damage the cultural fabric.

Higher education scholars have studied research culture over the years. The report of Hanover (2014) provides a background to the issue and some faculty and institutional characteristics. Some key characteristics of a research culture in a university are discussed here. These points are largely for the context of Indian universities, but most should be generally applicable.

- **Expectation of high-quality academics**. Any culture of an organization must start with what the organization expects from its employees. In a university, if the expectation is of high quality and excellence in academics, only then can it expect that people will try to achieve it. If modest expectations are set, then human nature will ensure that only small achievements are made. Therefore, to establish a thriving research culture, suitable expectations must be established. This means that internal policies for promotion and rewards are aligned with this expectation and that they are followed year after year. Just stating them and then not following them is of no value. Only when the expectations are consistently communicated and all internal systems and policies align with the expectations can excellence thrive. Most globally respected universities have achieved this. Often, the quality of venues of publication, impact of work, in terms of citations or other measures, and recognition of contributions by professional associations and peers are used to establish expectations.
  A key challenge in countries like India lies not only in articulating the expectations but also in aligning the policies and practices with these expectations. Sometimes, expedient

decisions are made, which can hurt the research culture. For example, if some faculty with mediocre records are promoted, it becomes a benchmark for future decisions and drives the expectations towards mediocrity. In such a situation, excellence survives only due to individual commitments and drive.

- **Strong motivations of faculty and research scholars for research**. There are umpteen examples of faculty and PhD students who have no strong reasons to be in the research profession—they may be there mainly due to the benefits they perceive. There are several examples of faculty in many universities across India and other countries who are in the profession mainly for teaching young minds and therefore engage minimally in research. Such faculty may be assets in teaching-focused universities, but they are not suitable for research universities. The faculty in a research university must be committed to conducting research and must have a strong personal motivation for the same, as only then can the drive be sustained over decades. The motivation can be enjoying research work and the respect that it accrues, collaborating with researchers across the world for exciting research, having a large research group and the name and fame associated with being a great researcher, having the fellowship of reputed associations, making an impact through research, participating in expert committees, and so forth. Ensuring suitable motivation requires care in faculty selection, so that only suitable candidates are appointed as faculty. Extra care should be taken during promotion and other evaluative processes to ensure that those who are excelling and improving their research performance are adequately rewarded.

  Similarly, students having adequate motivation for conducting research should be enrolled in the PhD programme. Again, the motives can be varied, but students should have strong personal reasons that motivate them to conduct research and they should put in the necessary efforts to obtain a good PhD. Those who are pursuing PhD just to get a title, perhaps for their career progression, are likely to do the least required to obtain a PhD. While such candidates also need access to the

PhD programme, it is important to have a majority of PhD students with a strong motivation to do high-quality work and build and support the research culture.

- **Institutional respect for peer recognition**. Almost a defining characteristic of faculty from research universities is that they cherish and seek recognition from peers. This recognition comes in the form of fellowships from academies and professional societies, awards from these societies, awards for their papers given by conferences and journals that publish their work, prestigious responsibilities, such as being the editor of a journal or chairing an important conference, and so forth. These recognitions are often viewed as the pinnacle of a career by many. It is important for a research university to support and strengthen the peer recognition–based value system. In other words, the administration set-up should serve as a facilitator with necessary powers to facilitate and support the work of the faculty, hence leading to their greater peer recognition. Therefore, although peer recognition is outside the university's direct purview, the university and its administrative set-up can support this value system by internally recognizing and suitably rewarding achievers.
- **Opportunities for casual interaction between researchers and a hierarchy-less structure**. It is known that many of the great research ideas emerge at odd times, often during casual conversations among researchers. Most faculty members, being autonomous and independent agents, have private offices of their own. It is desirable for a research university to provide opportunities, spaces, events, platforms, and so forth to facilitate casual interactions and discussions among researchers—not social interaction but academics-related interaction. Many business organizations are supporting this by creating open spaces in which multiple people sit across each other at the same table. Since such mechanisms are not suitable for academics, regular interaction opportunities should be created through events and informal meetings.

  Such interactions are even more important for interdisciplinary research, which is needed to address some important

problems in the world. For collaboration between the faculty of different disciplines, the faculty must meet each other and discuss their work informally, so that they understand each other's disciplines, vocabulary, motivations, and so forth. Ideas of projects that may involve the strengths of multiple disciplines can emerge when there is a decent understanding among faculty of each other and each other's disciplines. Hence, people with diverse ideas and from different disciplines should not only share their findings but also discuss conceivable new ideas and possibilities. While formal mechanisms can facilitate some aspects of this interaction, informal and casual interaction can supplement these.

Such interactions will thrive only if researchers form a flat, hierarchy-less group. Individuals should be allowed to express themselves freely, ask questions and raise doubts without feeling judged during these informal interactions.

- **Collaboration within and externally.** Many big challenges require multidisciplinary inputs for addressing them. Also, societal issues never align neatly along discipline boundaries. For many research challenges, researchers must work together to make a substantial impact. All these mean that collaboration between faculty within the department and across departments must be actively encouraged and promoted to have a vibrant research culture. While this is easy to state and understand, facilitating such collaborations needs suitable policies and encouragement. For example, a policy that attaches a substantial value to single-author publications (as was the case in a few disciplines earlier), or which insists that multi-author publications will be 'divided' among various authors for the evaluation of individuals, can go against the spirit of collaboration. Suitable policies and support/incentives for interdisciplinary projects or multi-researcher projects can help in promoting collaboration.

  Collaboration with colleagues at the global level is equally important. Research papers with authors from multiple countries are often cited more. Also, the pursuit of science and knowledge has been a global endeavour always. Hence, a

university needs to have its faculty as part of the global community of scientists and collaborate with them. Collaboration can be particularly beneficial for junior faculty by enhancing their research capabilities and helping them imbibe the research culture (Tynan and Garbett 2007).

Ultimately, many research problems originate from the problems encountered by the society or by industries. Hence, a university should have good linkages with industries and the society, encourage discussions among their representatives and the faculty and facilitate a better understanding and resolution of the challenges. Such research challenges can then be worked upon by faculty and PhD students. Research work that addresses societal and industrial challenges is likely to have a direct impact on the society and economy. This is often a desired goal for researchers, and it helps the university be more directly relevant to the society at large. Hence, a thriving research culture should have platforms for collaboration with industries and the society on projects.

- **Active sponsored research programme.** Faculty must be motivated and incentivized to compete externally for getting research grants. Universities expect most of their research funding to come through grants; hence, applying for sponsored projects and trying to get grants must be an important part of the research culture and is a feature that is universal in all research universities. This should be ensured by providing good support for getting and executing projects and suitable policies also. For example, even if it is possible for a university to support more PhD students from its own funds, it should promote supporting most of the PhD students through project funds—this will motivate faculty to apply for research projects.
- **Rewards for good research.** It is sometimes thought, idealistically, that faculty are pursuing research only for the sake of research and that they are a different type of people for whom material rewards are of little consequence. This picture of a driven scientist is clearly an idealization. Barring some dedicated researchers, most are well-educated and deep-thinking

professionals who want rewards and recognition for their contributions.

Hence, there must be rewards and recognition for good research in a broader sense—how research contributions are valued in terms of promotion, how excellent research is rewarded and how great researchers are recognized within the university. It should be noted that as only a few researchers achieve excellence while most can be considered as modest achievers, it is to be expected that this majority may want a more egalitarian system where all faculty are treated equally and excellence is not given any special treatment. However, without recognition, research excellence may not be sustained, and those who excel may move to other environments that recognize, respect and value excellence.

It should, however, be mentioned that faculty members as a community are indeed somewhat different from their professional counterparts in industries. Having chosen a profession with a flat structure and a tiny career ladder, they indeed highly value prestige from peers—from within the university and from the profession. Given the value system and the relatively flat structure, it is not desirable to consider financial incentives as the main form of rewarding, as is done in corporations. Such an approach may be counterproductive to the collegial and cooperative environment that a research university must have. Hence, the incentives for excellence should be a combination of prestige and recognition, extra support for the faculty member's research, compensation, and so forth.

- **Good work ethics**. It is almost impossible today to have significant research contributions with only a modest effort. A brilliant scientist, having reached a level, may be able to achieve a lot with a modest effort. However, for most, a modest effort can only lead to modest outcomes. While hard work and effort in themselves do not ensure success or more outcomes, a good work ethic is a necessary ingredient. As Hamming noted in his famous essay 'You and your Research' (Hamming 1986), effort goes a long way in the overall

> contributions a researcher makes in his/her career. Hence, a strong work ethic of putting in sufficient effort in the research (and teaching) endeavours is an essential component of a good research culture. This is extremely important in universities, because faculty are autonomous agents with a great deal of freedom and their efforts are never measured. In such a system, it is easy to slide into a minimal-effort zone—putting only as much effort as required to perform at an acceptable level in academics. Hence, the university and the faculty have to be vigilant to ensure that the work ethic is supportive and hard work is cherished and respected.

A thriving PhD programme is also essential to support and strengthen the research culture. Although there are many other ways to support the research culture and productivity (resources, suitable leadership, and so forth), having a strong PhD programme is indispensable. A large PhD programme with full-time PhD students, whose only goal is to pursue PhD and research, is essential to build a research culture. This also requires a good culture of interaction between PhD students and faculty and a culture of high aspirations among PhD students. The PhD programme has been discussed in more detail in a subsequent chapter.

Another aspect of a strong culture is having mentorship programmes and faculty development programmes for young faculty—these can really help the new faculty internalize the research culture and succeed in it (Tynan and Garbett 2007). These can be supported in universities if they have had a strong research culture for a long period of time and have senior faculty who live by that culture.

Many Indian universities have a weak research culture which supports and promotes mediocrity. A discussion of many aspects of the research culture in India is provided in Aggarwal (2018). It points out many aspects that come in the way of the strengthening of research in Indian universities, such as the research environment, incentive structure, PhD programme, relationship between faculty and PhD students, collaboration between researchers,

international interactions and collaboration, lack of critical mass of researchers in any discipline, etc.

4.4 SUMMARY

Research is, of course, the main driving aim of a research university. However, unlike education, research is an endeavour of individual faculty or a small group. Hence, considerable thought and energy have to be put in not only facilitating research but also promoting research. This chapter discussed the various aspects of research administration, including strategic planning, managing research projects, advancing research, having a robust research infrastructure, and so forth.

Research ethics is an area that has become increasingly important with the increase in competitiveness, volume of research and number of researchers. The research management team has to ensure that research ethics are followed. This chapter discussed some key aspects of research ethics and how they can be supported in a university.

Finally, the chapter discussed the issue of research culture. Clearly, a vibrant research and innovation culture can enhance the quantity and quality of research. Hence, a strong culture of research is indispensable. Although the culture is built by the people involved in research (largely faculty and PhD students in a university), suitable policies and support can enhance it. The chapter discussed various aspects of a vibrant research culture and what a university can do to support them.

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