Chapter 6

Ethical Issues in Research

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Research Techniques

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Participants

- people directly or indirectly involved in your research
  - the people you interview, observe or ask to complete a questionnaire or supply you with documents
- should treat participants involved (directly or indirectly) in research: fairly and with honesty
  - ethical researcher
- require that you consider the ethical aspects of your research project when you design it
  - obtain ethical clearance before you start
- people affected by the research in any way will not be harmed and will be treated fairly and with dignity
- research $\rightarrow$ ethical $\rightarrow$ approved $\rightarrow$ start
- research $\rightarrow$ unethical (any part) $\rightarrow$ researcher will be asked to think again $\rightarrow$ redesign the project.

The law and Research

- research and behaviour throughout the project, from literature review to the final outcomes: must be legal
- find out about the law in your country concerning such things as:
  1. Data Protection Rights and Duties
  2. Prize Draws and Research Participation
  3. Intellectual Property Rights (IPR)
  4. Technology Restrictions
  5. Software Developers' Legal Liability

Data Protection Rights and Duties

- Individual Rights:
  - Individuals have the right to control their personal data
  - Researchers must handle data responsibly, ensuring privacy and security
  - Example: Suppose you're conducting a survey
    - You must inform participants how their data will be used and obtain their consent
- Duties of Organizations and Researchers:
  - Organizations must comply with data protection laws (such as GDPR in the EU)
  - Researchers should obtain informed consent, protect data, and handle it only for legitimate purposes
  - Example: If you're collecting health data for medical research, ensure strict confidentiality and compliance with relevant regulations

Prize Draws and Research Participation

- Offering prize draws can encourage participation, but ethical considerations apply:
  - Clearly state the terms and conditions
  - Ensure that participation is voluntary and not force or threat
  - Avoid biasing results by attracting participants solely for prizes
  - Example: In a study on consumer preferences, you offer a gift card as an incentive
    - communicates that participation is optional, and the prize doesn't affect the study outcome

Intellectual Property Rights (IPR)

- legal protections for creations such as inventions, artistic works, designs, symbols, and names
- for example, who owns the right to an image you want to use in your research, and who has the copyright of your own thesis or other publications or any software you produce

Technology Restrictions

- restrictions on the kinds of technology you are allowed to use and investigate
- Example
  - whether your country allows unrestricted access to the Internet
  - If developing a secure messaging app, verify that encryption complies with national regulations

Software Developers' Legal Liability

- the legal liability of software developers for the systems they design and create
- Example: If you develop a medical diagnosis app, rigorous testing and proper disclaimers are crucial to avoid harm to users.

Rights of People Directly Involved

- rights of the people most obviously affected by your research
  - the people you interview or observe, or ask to complete a questionnaire or supply you with documents
- the different terms used to refer to the people most directly impacted by your research
  1. **Research Subjects (Experiments)**
  2. **Research Respondents (Surveys)**
  3. **Research Informants or Members (Case Studies and Ethnography)**
  4. **Research Participants or Co-Researchers (Action Research)**
- all participants are humans
  - They have a **right** to be treated with dignity and, whenever possible, to gain some benefit from the research
  - You should consider carefully whether your work is both ethical and legal
    - ensure that your participants suffer no adverse consequences: physiological, psychological, social, political or economic

Research Subjects (Experiments)

- In experimental research, individuals who participate in controlled experiments are often referred to as research subjects.
- Example: If you're conducting a study on the effects of a new drug, the patients receiving the drug become your research subjects.

Research Respondents (Surveys)

- When collecting data through surveys or questionnaires, the individuals who respond are called research respondents.
- Example: If you distribute a survey about online shopping habits, the people who complete the survey are your research respondents.

Research Informants or Members (Case Studies and Ethnography)

- In case studies and ethnographic research, individuals who share information, experiences, or insights with the researcher are called informants or members
- Example: If you're studying a specific community's cultural practices, the community members who provide insights become your research informants.

Research Participants or Co-Researchers (Action Research)

- In action research, individuals actively engage in the research process. They may collaborate with the researcher, especially in more emancipatory forms of action research
- Example: If you're working with a group of teachers to improve classroom practices, they are both research participants and co-researchers.

Rights of participants

- Right not to participate
- Right to withdraw
- Right to give informed consent
- Right to anonymity
- Right to confidentiality

Right not to participate

- Participants have the right to decline participation in a study without any negative consequences
  - Researchers should respect their autonomy and not try to force them with threats
- Non-participation may affect the ability to complete research
  - that's researcher's problem, not theirs (participants)
- Example: If someone declines to be part of a survey on the shopping experience, their decision should be honoured.

Right to withdraw

- Participants can withdraw from a study at any time, even after initially agreeing to participate
- Researchers must inform participants of this right during the consent process
- Example: by declining to answer certain questions or by refusing to participate in some activities.

Right to give informed consent

- Participants have the right to receive clear and comprehensive information about the study before agreeing to participate
- Participants must be informed about:
  - the purpose of the research, why it is being undertaken and what benefits are expected from it
  - who is undertaking the research (name, address, contact details) and which organization is sponsoring it — either by funding it or overseeing and authorizing it
  - what will be involved (for example, interviews, completing a questionnaire and so on) and how long this is likely to take
  - whether they will receive any expenses, payment or incentive (for example, individual feedback on performance in a test, or a copy of the final research report);
  - how their data will be used and how the research findings will be disseminated.
- must also be informed that they have the right not to participate and the right to withdraw from the research at any time

Right to anonymity

- Participants in research have the right that their identity and location will be protected by disguise where necessary
- Researchers should use codes or pseudonyms to protect privacy
- Example: In an online survey, participants' names are not associated with their answers.

Right to confidentiality

- Researchers must keep participants' information confidential
- Data should be securely stored and accessible only to authorized personnel
- Researchers should not pass on sensitive information learned about participants to others in positions of authority (unless legally required)
- Example: If conducting interviews, avoid sharing specific quotes that could identify individual participants

- Is it ever justifiable to withhold from participants the aims of the research?
- Is it ever justifiable to carry out research when the subjects of the research cannot give informed consent?
- Is it justifiable to use people as the objects of research?
- Is it justifiable to carry out research that will solely or mainly benefit the researcher by, for example, leading to a PhD?
- Is it justifiable to carry out research when those funding the project retain the right to censor the findings?
- Is it justifiable to accept funding for health research from the tobacco industry?
- Is it justifiable to carry out research when the findings might be used to reduce staffing levels or withdraw treatment from certain categories of patients?

Responsibilities of an Ethical Researcher

- Ethical researchers can infer (conclude) their responsibilities from the rights of participants
  - researchers should respect participants' expectations of anonymity and confidentiality
  - they should not try to force (coerce) people into participating in the research
  - they should obtain informed consent and not deceive people about the research

Responsibilities of an Ethical Researcher

- No unnecessary intrusion
- Behave with integrity
- Follow appropriate professional codes of conduct
- No plagiarism
- Be an ethical reviewer

No unnecessary intrusion

- Researchers should respect the privacy and autonomy of individuals or groups they study
- Avoid unnecessary intrusion into their lives or personal spaces
- Obtain informed consent from participants before collecting data, especially in sensitive areas such as medical research or social studies
- Example, in designing questionnaires, researchers sometimes automatically insert questions asking about the participants' age, which respondents may find intrusive.

Behave with Integrity

- Integrity is crucial in research: involves honesty, transparency, and ethical behavior
- Researchers should accurately report their findings, even if those findings challenge their initial hypotheses
- ethical researcher also thinks about how the research findings will be used and tries to make sure they can do no harm

Follow Appropriate Professional Codes of Conduct

- Most professional bodies have produced codes of conduct
- Codes capture the profession's commitments and responsibilities, to help members make ethical decisions

No Plagiarism

- Plagiarism undermines the credibility of research
- Always attribute sources properly
  - When citing previous work, ideas, or data, follow the appropriate citation style (e.g., APA, MLA, etc.)

Be an Ethical Reviewer

- If you review research papers or grant proposals, evaluate them fairly and without bias
- Maintain confidentiality during peer review
- Provide constructive feedback to improve the quality of research

Data Privacy and Security

- Data security and privacy are essential in research data management to protect sensitive information from unauthorized access, breaches, or misuse
- Researchers need to use secure storage, and access controls to protect data throughout its lifecycle
  - Develop a data-collection plan for preserving participants' confidentiality
  - Acquire informed consent
  - Remove or modify personal identifiers in a dataset to prevent individuals from being identified
    - Key techniques include masking or generalizing data, suppression, and pseudonymization
- Compliance with privacy regulations such as GDPR and HIPAA is also essential when dealing with personal or health-related data

What are the best practices for ensuring data privacy in research?

Case Study

The Facebook-Cambridge Analytica scandal illustrates the misuse of personal data and highlights the need for stringent data privacy measures

- In 2018, it was revealed that Cambridge Analytica, a political consulting firm, had improperly accessed and used the personal data of approximately 87 million Facebook users without their explicit consent
  - Most users whose data was collected never gave consent or were even aware of it
- This data was harvested through a third-party app called "**This Is Your Digital Life**," which posed as a personality quiz
- While only about 270,000 people directly participated in the quiz and gave consent, the app exploited Facebook's API to access not just the participants' data but also the data of their friends and connections.

Case Study

- Cambridge Analytica used the data to create targeted political advertisements aimed at influencing elections, including the 2016 U.S.
- Presidential Election and the Brexit referendum in the UK. This raised concerns about manipulation of voter behavior and democracy.

Plagiarism

- Plagiarism occurs when someone uses another person's work, ideas, or expressions without giving proper credit or acknowledgment
  - Copying text, diagrams, or research data without citation
  - Presenting someone else's ideas as one's own
  - Failing to paraphrase adequately while using another person's research
- disrespects the original author's contributions and damages trust in the research community
- may breach copyright laws and academic codes of conduct

Types of Plagiarism

1. Direct Plagiarism: Word-for-word copying of someone else's work
2. Self-Plagiarism: Reusing your own previously published work without proper citation
3. Mosaic Plagiarism: Patching together phrases from multiple sources without proper acknowledgment
4. Accidental Plagiarism: Failing to cite a source due to oversight or lack of understanding

Intellectual Property

- Intellectual Property (IP) refers to creations of the mind, such as inventions, literary works, designs, symbols, names, or images
  - Copyright: Protects the original expression of ideas, such as articles or software
  - Patents: Grants exclusive rights to inventors for their inventions
  - Trademarks: Protects brand names and logos
  - Trade Secrets: Covers proprietary knowledge or practices that are kept confidential

Environmental Responsibility

- refers to conducting research activities in a way that minimizes negative environmental impacts and promotes sustainable practices
- involves making conscious decisions at every stage of the research process to reduce the consumption of resources, limit waste, and lower carbon footprints
  - Leveraging virtual meeting platforms (Zoom, Teams) reduces the environmental impact of flying researchers worldwide
- aligning with the United Nations Sustainable Development Goals (SDGs), particularly Goal 13 (Climate Action) and Goal 12 (Responsible Consumption and Production)
- High-performance computing (HPC) clusters used for simulations and machine learning consume vast energy
  - Leveraging green data centers powered by renewable energy
  - Scheduling tasks during low-energy-use periods
- Example: Google's Tensor Processing Units (TPUs) are designed to reduce energy use during large-scale AI computations, setting a benchmark for sustainable computational research

- Funding agencies increasingly require researchers to outline how their projects will minimize environmental impact
  - Example: The European Union's Horizon Europe program emphasizes environmental sustainability in its funding criteria
- Many universities have introduced "Green Labs" programs to promote sustainable research practices
  - Example: Harvard University's Green Labs Program provides resources for energy-efficient equipment and waste reduction strategies

Conflict of Interest (CoI)

- occurs when a researcher's personal, financial, or professional relationships interfere, or appear to interfere, with their ability to conduct research objectively
- undermine the integrity, credibility, and impartiality of the research process
- **Best Practices to Manage CoI**
  - Disclosure: Researchers must openly declare any potential conflicts of interest in publications, grant applications, or collaborations
  - Institutional Oversight: Universities and funding bodies should implement COI policies to review and address potential conflicts
  - Transparency: Maintain openness with collaborators, stakeholders, and the public.

Copyright

- form of intellectual property protection granted to creators of original works, such as books, software, music, and research articles
- gives the creator exclusive rights to reproduce, distribute, and display their work

Patent

- legal right granted to an inventor, giving them exclusive control over their invention for a specific period (usually 20 years)
- protects innovations that are novel, non-obvious, and useful

Code of Ethics

- set of principles that guide the behaviour of individuals or organizations, ensuring they act with integrity, fairness, and accountability
- enforced by internal policies or external regulatory bodies such as governments, professional associations, or industry watchdogs
- Example: General Data Protection Regulation (GDPR) in Europe, which will come into effect on May 25th, 2018
  - GDPR is created to enforce privacy rights and give people more control over their data
  - Penalties for violating it can be fines up to 20 million or 4% of annual global turnover - whichever is greater

Association for Computing Machinery (ACM) Code of Ethics

- provides guidelines for computing professionals to uphold integrity, fairness, and responsibility
- guides computing professionals in applying fundamental ethical principles to their conduct
  - Ethics in computing, responsible technology use, and social responsibility
- It is not a strict algorithm for solving ethical dilemmas but rather a foundation for ethical decision-making
- When addressing a specific issue, professionals must consider multiple principles, weighing their relevance to the situation
- consists of four key principles
  1. General Ethical Principles (Fundamental Ethical Responsibilities)
  2. Professional Responsibilities
  3. Professional Leadership Principles
  4. Compliance with the Code

General Ethical Principles (Fundamental Ethical Responsibilities)

- Contribute to society and human well-being
- Avoid harm to others
- Be honest and trustworthy
- Be fair and take action against discrimination
- Respect privacy and confidentiality

Professional Responsibilities

- Maintain high professional standards
- Know and respect laws and policies
- Honor contracts and agreements
- Ensure public understanding of computing systems

Professional Leadership Principles

- Create and maintain inclusive, respectful workplaces
- Support public policies that enhance social responsibility

Compliance with the Code

- Adhere to the code, encourage others, and take corrective actions when ethical violations occur

IEEE Code of Ethics

- Institute of Electrical and Electronics Engineers (IEEE) Code of Ethics promotes ethical decision-making for engineers and technologists
- focuses on Engineering ethics, professional conduct, and public safety
- includes the following principles
  1. Public Interest and Well-Being
  2. Honesty and Integrity
  3. Professional Responsibility
  4. Fairness and Non-Discrimination
  5. Environmental and Social Responsibility

Public Interest and Well-Being

- Prioritize the safety, health, and welfare of the public
- Disclose potential dangers in technology and engineering projects

Honesty and Integrity

- Be honest and transparent in claims, research, and project work
- Avoid deceptive practices

Professional Responsibility

- Maintain professional competence and improve technical knowledge
- Reject bribery and conflicts of interest
- Properly credit contributions and intellectual property

Fairness and Non-Discrimination

- Treat all individuals fairly, avoiding discrimination based on race, gender, religion, disability, etc.

Environmental and Social Responsibility

- Consider the environmental and social impact of engineering decisions.