1. Introduction

Birmingham City University has a responsibility to ensure that members of staff and students who carry out research do so according to best practice in science, the arts and humanities. The University expects the highest standards of scientific integrity to be adhered to. The University’s Research Ethical Framework (See Annex 1) sets out the ethical principles underpinning the conduct of research.

This guide on good research practice sets out the other issues that should be taken into account when planning, conducting and reporting research. It addresses the principles involved in the proper conduct of research, provides guidance on the standards expected, identifies the University’s key procedures for ensuring the highest achievable standards in the conduct of research, and sets out the procedures to be followed should allegations of research misconduct be made. The statement is intended for:

- Researchers and support staff employed by the University;
- Research students and their supervisors;
- Researchers and consultants who may be subcontracted on BCU research contracts;

Research Councils have adapted the general principles of good scientific practice to meet the particular characteristics of the disciplines that they serve and it is expected that AHRC will do the same at some time in the future. Faculties at BCU should take these statements into account if they wish to supplement this document with any discipline-specific additions.

2. Principles of Good Scientific Practice

The following general principles derive from the statement of the OST Research Councils on Good Scientific Practice. The main principles refer to:

- The fundamentals of scientific work such as maintaining professional standards of honesty, openness, recognising the standards of professional bodies, documenting results, questioning one’s own findings, and attributing honestly the contributions of others.
- Leadership and cooperation in research groups
- The needs of young researchers
- Securing and storing primary data

In the conduct of all research, the University expects the following principles to be understood and observed.

2.1 Professional standards

Honesty
At the heart of all research endeavour, regardless of discipline or institution, is the need for researchers to be honest in respect of their own actions in research and in their responses to the actions of other researchers. This applies to the whole range of research, including experimental design, generating and analysing data, publishing results, and acknowledging the direct and indirect contributions of colleagues, collaborators and others. All staff and students must refrain from plagiarism, piracy or the fabrication of results. Committing any of these actions is regarded as a serious disciplinary offence. The University’s procedures for investigating and dealing with allegations of research misconduct by staff can be seen in Annex 2 and the Staff Handbook. For students, including research students, disciplinary procedures and notes for guidance can be found at: http://diglib.uce.ac.uk/webgate/dlib/output/2996.1/11-STU_1.DOC

Openness

While recognising the need for researchers to protect their own interests and the interests of the University in the process of planning and carrying out their research, the University encourages them to be as open as possible in discussing their work with other researchers and with the public. The University supports the widest dissemination of results possible, unless confidentiality agreements have been put in place and/or it has been agreed that sponsors will own the intellectual property.

Guidance from professional bodies

The University also expects staff to observe the standards of research practice set out in any guidelines published by scientific societies and other relevant professional bodies.

Documenting Results

In order to respond to the needs of funding bodies, the University requires researchers to keep clear and accurate records of the research methods used and of the results obtained, including interim results. This is necessary not only as a means of demonstrating proper research practice, but also in case questions are subsequently asked about either the conduct of the research or the results obtained.

A critical approach to research results

Academics should always be prepared to question the outcome of their research. While fully supporting academic freedom and acknowledging the pressures of time and resources under which researchers often have to work, the University expects research results to be checked before being made public.

Acknowledging the role of collaborators and other participants

The issue of authorship is an important aspect of good research practice and, in the context of the growth of multiple authorship in recent years, the University expects anyone listed as an author of a research output to accept personal responsibility for ensuring that they are familiar with the contents of the output. The contributions of formal collaborators and all others who directly assist or indirectly support the research must be properly acknowledged. This applies to any circumstances in which statements about the research are made, including provision of information about the
nature and process of the research and in publishing the outcome. Failure to acknowledge the contributions of others is regarded as unprofessional conduct. Conversely, collaborators and other contributors carry their share of the responsibility for the research and its outcome. Authors are also responsible for ensuring that they agree with the way in which their contribution to any research output is presented. Where appropriate, the support of funding bodies should be acknowledged in publications.

2.2 Leadership and cooperation in research groups

It is the responsibility of senior staff in the University to ensure that a climate is created which allows research to be conducted in accordance with good research practice. In BCU, the Pro-Vice-Chancellor responsible for research works with Deans and faculty Directors of Research to ensure that heads of schools, heads of research centres, research team leaders and project directors work together to promote such a climate. Leaders of research units are expected to create a research environment of mutual cooperation, in which all members of a research team are encouraged to develop their skills and in which the open discussion of scientific ideas is fostered. They must also ensure that appropriate direction of research and supervision of researchers are provided. Unit leaders are responsible for the creation of a constructive atmosphere and for ensuring that research staff have the appropriate training and experience to carry out their duties as effectively as possible. This is especially important for new staff.

2.3 The needs of young researchers

Researchers who are new to research may face particular difficulties. Responsibility for ensuring that new researchers and students understand good research practice lies with all members of academic staff, but particularly with Deans and faculty Directors of Research, research team leaders and supervisors of research students. BCU’s approach to training and mentoring for young or new researchers and research students are set out in Annex 3.

2.4 Securing and storing primary data

Research Councils expect data to be securely held for a period of ten years after the completion of a research project. Data generated in the course of research must therefore be kept securely in paper or electronic form. The means of data storage should be appropriate to the task. Primary electronic data should be stored on a central server, in addition to any storage that is maintained at the local level. If individuals responsible for generating the data relocate, a set should be maintained in the University. This is important for research that is funded by research councils but it also applies to research that is funded from other sources.

3. Allegations of Research Misconduct

The University takes seriously any allegation of research misconduct, and expects such allegations to be thoroughly investigated. Piracy, plagiarism and fraud are considered to be examples of misconduct and are defined as follows:

- Piracy is the deliberate exploitation of ideas from others without acknowledgement;
Plagiarism is the copying of ideas, data or text without permission or acknowledgement; 
Fraud involves deliberate deception, including the invention of data, and the omission from analysis and publication of inconvenient data.

Allegations of research misconduct may come from others in the university, such as research students, research assistants or colleagues; or they may come from outside the institution from, for example, other researchers who may feel that their work has been plagiarised. To be followed up, allegations must be in writing. When an allegation is made, the University will respond to it.

Allegations of research misconduct by staff will be dealt with according to the procedures set out in Annex 2. These procedures seek to be fair to both the complainant (the person(s) responsible for making an allegation of misconduct) and the respondent (against who the complaint is being made). If, after an initial investigation to ascertain whether or not there is a case to answer, a decision is made to proceed, managers will ensure that the investigation and interviews are conducted with scientific advice that is both relevant and neutral.

A presumption of innocence is maintained until the investigation process is complete and complainants who have made allegations in good faith, whether substantiated or not, will be protected. If allegations are unfounded, the University will take whatever actions are necessary to maintain or restore the reputation of respondents.

In cases where an allegation of research misconduct is upheld, appeals will be considered in accordance with the procedures and mechanisms laid down in the disciplinary procedures, the results of which are final.

These guidelines and the annexes on the University’s Research Ethical Framework and on Supporting Young or New Researchers will be subject to review one year after their adoption by BCU.

References

BBSRC, Statement on Safeguarding Good Scientific Practice, www.bbsrc.ac.uk


EPSRC, Guide to Good Practice in Science and Engineering Research, www.epsrc.ac.uk

Medical Research Council, Guidance on the assessment and conduct of research and on publishing results (MRC Ethics series).


Royal College of Physicians, Fraud and misconduct in research: causes, investigation and prevention (RCP, 1991).

The Wellcome Trust, Guidelines on Good Research Practice, Wellcome Trust, 2002.
ANNEX 1

BCU’S RESEARCH ETHICAL FRAMEWORK

1. Introduction

1.1 This document sets out a framework through which staff and students of the University give consideration to the ethical implications associated with any research that they undertake. Further Guidance Notes consistent with the principles and requirements of the framework will be produced by Faculties so as to inform and disseminate good practice.

2. Background

2.1 Funding bodies are increasingly requiring research proposals to indicate the processes that universities have in place for considering research ethics.

2.2 This framework has been informed by practices and processes operating in different Faculties, which themselves respond to the principles and requirements of external bodies.

2.3 The ethical framework should be read and operated in conjunction with other policies of the University’s Board of Governors or Senate that may have a bearing on ethical issues.

2.4 The framework does not attempt to define or alter the obligations of staff or students under English law (please see Appendix 1).

2.5 The framework points to a set of obligations to which all staff and students should normally adhere as principles for guiding their conduct. The purpose is to ensure that staff and students are aware of the ethical obligations that may arise in their academic activity, and to encourage ethical behaviour. The framework does not, therefore, provide a set of answers to all ethical dilemmas, and the researcher is required to make specific decisions on the basis of careful consideration of all contributing factors.

3. Ethical Statement

3.1 The University expects that staff will behave professionally and ethically in all its activities. This implies that staff and students who are engaged in research and other activities are aware of the ethical implications of such activities and are committed to discharging their responsibilities to the University, to clients and to research participants in an ethical manner, conforming to the highest professional standards of conduct.

3.2 Issues of morality, safety and personal and institutional liability affect the University at many levels. The University must be seen to be acting with propriety and care for the welfare of staff, students and the wider public.

3.3 The practice of ethics is about conducting one’s research in a disciplined manner within legal and other regulated constraints and with minimal impact on and detriment to others.
3.4 It is the responsibility of staff within the University to consider the ethical implications of their research using the framework as a guide to fulfilling their obligations.

3.5 It is the responsibility of Faculties to ensure that staff and students are aware of their ethical obligations and that processes are in place to support them when elaborating methodologies, responding to the ethical requirements of funding bodies, or confronting ethical dilemmas.

4. Definitions of Terms

In the context of this framework the following definitions of terms apply:

4.1 “Research” is understood as original investigation undertaken in order to gain knowledge and understanding. It includes work of direct relevance to the needs of commerce and industry, as well as to the public and voluntary sectors; scholarship; the invention and generation of ideas, images, performances and artefacts, including design, where these lead to new or substantially improved insights; and the use of existing knowledge in experimental development to produce new or substantially improved materials, devices, products and processes, including design and construction.

4.2 A “researcher” is a member of staff or student engaged in research activity.

4.3 A “participant” is an individuals and/or organisation that comes into contact with the University through research activity.

5. Principles for the Consideration of Ethical Issues

5.1 Staff and students shall be made aware of their responsibilities and obligations to consider ethical issues arising from their research at or on behalf of the University.

5.2 The dignity, rights, safety and well-being of participants must be the primary consideration in any research study.

5.3 Informed consent is at the heart of ethical research.

5.4 The ethical implications of research shall be assessed through a consideration of, for example:

- the sensitivity of any data that may be collected, with particular regard to matters such as age, colour, race/ethnicity, nationality, disablement, religion, sex, gender, sexual orientation, personal medical records and political beliefs;
- the transparency to junior research staff and participants as to the purpose and possible uses of the research;
- the research methods and any risks involved;
- the confidentiality of information provided by research participants;
- the security and well-being of participants;
- the arrangements for the security of data;
- the arrangements for ensuring the anonymity of participants;
• whether any payments are to be made to the participants or other rewards granted and the integrity of that provision;
• whether any special indemnification arrangements may be required;
• the intellectual property rights of all those involved in the research, including research staff, research participants and the university;
• arrangements for the publication of research results, including issues of co-authorship and acknowledgement;
• the desirability of an objective assessment being conducted of the ethical implications of the proposed academic activity by a competent person who has no direct association with it or the researcher(s) involved;
• the ethical issues/guidelines of any third party involved in the University’s activities, such as professional bodies or providers of research funding.

Where applicable, research must comply with the following requirements:

• the size of sample proposed for any enquiry shall not be larger than justifiably necessary;
• lines of enquiry must be pertinent and must not cause undue distress;
• any relationship between the researcher(s) and the participant(s) must be declared;
• participants shall be made fully aware of the true nature and purpose of the study, except where there is satisfactory justification for withholding that information (such as the likelihood of the end results being affected);
• participants shall have given their explicit consent, except where there is satisfactory justification for not obtaining this consent and the participants will not be adversely affected;
• participants must be informed at the outset that they can withdraw themselves and their data from the research activity at any time and they must not subsequently be put under any pressure to continue;
• processes shall be in place to ensure that the rights of those participants who may be unable to assess the implications of the proposed work are safeguarded;
• risks to the researcher(s), the participant(s) or the University shall be assessed;
• any potential risk to the University must be outweighed by the value of the research;
• if any research is concerned with studies on activities which themselves raise questions of legality, there must be a persuasive rationale which demonstrates to the satisfaction of the University that:

  i) the risk to the University in terms of external (and internal) perceptions of the worthiness of the work has been assessed and is deemed acceptable;

  ii) arrangements are in place which safeguard the interests of the researcher(s);

  iii) special arrangements have been made for the security of related documentation and artefacts.
Effective procedures to consider ethical issues within the University shall be established at the Faculty level and they shall comply with any specific requirements by the Senate. Such procedures shall provide for:

- an Ethics Check Form for affirming that ethical issues have been satisfactorily addressed and, where appropriate, granting assent;
- published requirements which describe the approvals process to which each research project is to be subject;
- published information on designated staff or the committee with responsibilities for managing the procedures;
- procedures for intervention where breaches of guidelines are alleged;
- a review process for considering ethical issues to ensure their currency, effectiveness and consistency with best practice.

6. Mechanisms for the Consideration of Ethical Issues

6.1 An appropriate entry to be included in the Staff Manual drawing the attention of every member of employed/contracted staff to their obligations;

6.2 The incorporation within student handbooks of a statement informing students of their ethical obligations and responsibilities;

6.3 The issue of research ethics to be raised during the induction of research students and to be part of research methods training;

6.4 Faculty Research Degrees Committees to affirm that ethical issues in relation to each individual research degree application have been satisfactorily considered;

6.5 The University’s Research Degrees Committee to affirm that ethical issues in relation to each individual research degree application for the PhD by published work have been duly addressed.

7. An Ethics Check Form

7.1 As far as is possible, a common ethics check list should be used across the University. However, it is recognised that there may be some variation between Faculties because of the different types of research and the requirements of external bodies;

7.2 Most of the key questions to be addressed by researchers are likely to be consistent across Faculties (See Appendix 2);

7.3 A faculty form would reduce these questions to identify major issues that will clarify whether further scrutiny is required.
Research Ethics Framework Appendix 1

1. This ethical framework does not attempt to define or alter the obligations of staff or students under English law, for example:

   Data Protection Act 1998

   Children Act 1989

   Human Rights Act 1998 (Amended 2001)


   Disability Discrimination Act 1995

   Disability Rights Commission Act 1999

   Special Educational Needs and Disability Act 2001

   Sex Discrimination Act 1975, Sex Discrimination (Indirect Discrimination and Burden of Proof ) Regulations 2001

   Freedom of Information Act 2000

2. Staff and students should also be cognisant with, and abide by, the published codes of conduct, ethics principles and guidelines of those professional bodies associated with their discipline.
Research Ethics Framework Appendix 2

An Ethics Check List

1. *The researcher’s responsibility and the outcomes of research*
   
   - Why is this research worth doing? What is the likely impact of the research outcomes?
   - How do participants in your research benefit from the knowledge you produce?
   - Are there other stakeholders in your research? If so, how do they benefit?
   - Does your research have broader human, social, cultural or religious implications? If so, what are they?
   - What impact, if any, does your research have on the environment?
   - If the research results in the public display of materials or outputs, what is their likely impact?
   - Where ethical dilemmas have arisen, what steps have you taken to resolve these? How have (will) you ensure(d) a balance between academic or creative freedom, and civil responsibilities in the community?

2. *Responsibility to research participants*
   
   - How do you explain the purposes of your research to your participants? If you do not, how is such a strategy justified?
   - How can you demonstrate that your participants’ consent is fully informed? Are participants given the opportunity to decline participation in the research? How do you record their informed consent?
   - How will you get their consent for any subsequent use of the material? Are participants able to withdraw their consent at any point? How?
   - Are there any possible negative effects (long or short term) on your participants (including any emotional discomfort)? How are these be justified?
   - How might participants gain from being involved in the research?
   - Do any participants require special consideration (children, people with disabilities, other vulnerable groups)? If so, how will you demonstrate that you have given due regard to this, and not exploited your participants?
   - Are you in a position of power or authority in relation to participants? If so, is it permissible to undertake the research?
   - How will you ensure individual respondents cannot be identified from any research reports or papers that are produced? If participants may be identified (whether deliberately, or not), have they agreed to this and/or been advised that this may occur?
   - How do you record any agreement?
   - How will you report back from the research to your participants?
   - Does the research cause you to have access to commercial or sensitive information? How will you ensure the confidentiality of this information?
   - Are you able to offer a confidentiality agreement prior to results entering the public domain?
   - What will happen to the data (e.g. interview notes, transcripts, questionnaires) once the project is finished? How will you ensure that your research complies
with current data protection legislation, with respect to personal information about individuals?

- Could the research cause any suffering to animals? To what degree would this be justifiable? Can you demonstrate that your research complies with current legislation relating to animals, human body parts, human tissue?

3. **Responsibilities to the subject and future researchers**

- Have you conducted your research in such a way that those who have participated would consider participating in future research projects?
- What understanding of the value of research have you left behind you? How do you know?
- How do you demonstrate the methodological rigour and transparency of the research?
- How is the conduct of the research and its progress reported between the parties involved (research students, supervisors, sponsors)?
- How is due acknowledgement given to the work of others?
- Who ‘owns’ the outcomes of the research? How is this recorded?
ANNEX 2

BCU’S POLICY AND PROCEDURE FOR INQUIRING INTO
ALLEGATIONS OF RESEARCH MISCONDUCT

1.  INTRODUCTION

1.1 GENERAL POLICY

Birmingham City University expects the highest standards of integrity to be observed in the pursuit of the research it supports.

Allegations of research misconduct will be investigated fully and the outcome of the investigation will be reported to the University Audit Committee. The University is also committed to protecting its staff from malicious accusations and will take action against any individual(s) responsible for such allegations.

These procedures are designed to reflect the need for expert knowledge to resolve complaints of research misconduct. Where timescales are indicated it is anticipated that these will be regarded as maximum limits and that all parties will work to ensure prompt progression of the procedure.

This policy will be subject to review one year after its introduction.

1.2 SCOPE

Where allegations of misconduct are made by an individual or body external to the University, that individual or body will be made aware of the University’s procedures and of the University’s expectation that they will participate in the procedures and comply with their requirements.

1.3 PRINCIPLES

1.3.1 GENERAL RESPONSIBILITY TO REPORT MISCONDUCT

If an individual is unsure whether a suspected incident of research misconduct falls within the definition, he or she may discuss this with the Dean of Faculty informally. If the Dean decides that circumstances described by the individual do not meet the definition of research misconduct, he/she will advise the individual as appropriate. If the Dean decides that circumstances described by the individual do meet the definition of research misconduct, he/she will request submission of the allegation formally to the ProVC.

1.3.2 COMPLAINANTS/WITNESSES

The complainant is responsible for making allegations in good faith, maintaining confidentiality, and co-operating with an investigation. Complainants must accept that they may be called upon to establish their allegations within the framework and safeguards of this procedure. The particular difficulties that respondents face in
defending themselves against anonymous allegations will be considered very carefully at the preliminary action stage before proceeding to the formal stage. At any time, an employee may have confidential discussions and consultation about concerns of possible misconduct with the Director of Human Resources and seek advice about appropriate procedures to report allegations. The complainant shall have an opportunity to present evidence before the investigation and disciplinary panel, to be informed of the results of the investigation and disciplinary panel, and to be protected from victimisation.

The ProVC will monitor the treatment of individuals who bring allegations of misconduct or who co-operate in assessments or investigations. If the complainant requests anonymity, the Director of Human Resources will make an effort to support this request subject to the requirements of the first paragraph above. The University will make diligent efforts to protect the positions and reputations of those persons who, in good faith, make allegations. The ProVC will ensure that those making an allegation in good faith or co-operating in an assessment or investigation into an allegation of misconduct will not be retaliated against in their employment. The University will take action against individuals who victimise complainants.

2. STAGE 1: PRELIMINARY ACTION

The first formal step is for the allegation to be reported to the Pro Vice Chancellor responsible for Research (ProVC). The ProVC will consider immediately the allegation to determine whether it falls within the scope of the procedure, and whether an investigation is warranted.

If the ProVC decides that an investigation is not warranted he/she will record his/her justification for that decision and inform the complainant and respondent(s) of this outcome.

In circumstances where an allegation relates to research misconduct which may be placing at risk other employees, or research subjects, the ProVC will notify the Director of Human Resources of the issue, who will advise the VC if there are ground for suspension of the employee concerned. The VC will ensure removal of the risk or, if necessary, suspend the respondent on full pay pending the outcome of the investigation.

3. STAGE 2: INVESTIGATION

The University’s normal disciplinary process will apply. However, in recognition of the need for technical expertise, the panel carrying out the investigation will include someone with appropriate expertise in the relevant field of research.

4. SANCTIONS

If the outcome of the investigation is that the alleged misconduct is substantiated by the findings, the panel will determine appropriate sanction(s) and impose this/these on the respondent(s). Actions which may be recommended by the disciplinary panel may comprise one or more of:

- removal from the particular project
- written warning, final or otherwise
5. APPEALS

Individuals will have the right of appeal against the outcome of the disciplinary panel in accordance with the University’s disciplinary appeals procedures.

6. RESTORATION OF REPUTATIONS

The University will take all reasonable action to restore the reputation of the respondent if the respondent is not found guilty of research misconduct and will consult the respondent to ensure that appropriate publicity is given to this outcome.

7. RESIGNATION OR TERMINATION OF EMPLOYMENT OR ATTACHMENT PRIOR TO COMPLETION OF ASSESSMENT OR INVESTIGATION

The termination of employment of the respondent, by resignation or otherwise, before or after an allegation of possible research misconduct has been reported, will not preclude or terminate the misconduct procedures. If the respondent, without admitting to the misconduct elects to resign his or her position prior to the initiation of an inquiry, but after an allegation has been reported, or during an assessment or investigation, a decision will be taken as to whether in the circumstances the inquiry will proceed, with the presumption that it will unless there are good reasons for the contrary.

8. MALICIOUS ACCUSATIONS

Where the outcome of a preliminary investigation, disciplinary hearing or appeal stage indicates that an allegation has not been made in good faith, the University will pursue disciplinary action against an internal complainant and action as appropriate against an external complainant.
Supporting Young or New Researchers

The Research Councils’ statement on ‘Safeguarding Good Scientific Practice’ identifies support for young researchers as a matter of particular concern and they recommend that ‘institutions should ensure that responsibilities for, and standards of, “mentoring” young workers exist within their codes of good practice’. Institutions should have systems that allow students and new researchers to understand and adopt best research practice as quickly as possible. For research students, responsibilities for supervision and training are set out in the Research Degree Regulations and in the Handbook for Research Students. This Appendix refers to the needs of young or new research staff.

The recent HEFCE funded research on good management practice for research staff points out that lack of visible support for young researchers is common across higher education and that where support does exist, research staff feel more valued and better motivated; existing policies are not always properly implemented; principle investigators (PIs) do not focus enough on the development of research staff; there is a lack of openness with young researchers by PIs; researchers feel undervalued; good people management skills are lacking among PIs; and a lack of visible career paths leads to insecurity.

The report argues that good management support depends on: shared responsibility amongst all stakeholders; PIs fully assuming their roles as research managers; a supportive environment where there is access to information and advice and where the researchers are integrated into the institution; effective induction, staff review and exit mechanisms; honesty and openness at all stages of the research; and encouragement to develop skills and experience.

The above implies that project directors, research team leaders, heads of department, deans and senior university management have certain responsibilities for supporting and developing young researchers. It is in this context, therefore, that at BCU.

Project directors and team leaders are expected to:

- Ensure that all new research staff receive appropriate induction, even if they have worked with a different research group in the University or have been a student at BCU.
- Ensure that young or new researchers have reasonable access to research managers.
- Arrange regular review meetings to plan training and development.
- Seek additional funds within externally funded projects to support the development of research staff.
- Be honest and realistic about the likelihood of further funding.
- Provide guidance on career planning.

Deans, Directors of Research and Heads of Departments should:

- Be aware of their responsibilities in relation to the employment of young or new researchers and should support Project Directors and research team leaders in the implementation of theirs.
- Monitor the implementation of induction and review processes for young or new researchers.
- Carry out end of contract interviews with them.
- Support management training for research managers.
- Ensure that researchers are involved in the wider life of the department and faculty.
- Use the quality of research management as one of the performance criteria in IPRs.

The University will:

- Monitor and review policies and practices for the employment of research staff
- Organise training for Project Managers
- Ensure that deans, heads of department and project managers are aware of their roles and responsibilities with respect to young and new researchers.
- Include provision for research staff in university staff development programmes
- Monitor end-of-contract review meetings
- Carry out exit interviews.

Research supervisors should ensure that research students conform to University regulations and codes of practice and they should also ensure that ethical, health and safety issues are addressed at each stage of the research.