· A GUIDE TO ·

PREPARING GEOSCIENCE RESEARCH PROPOSALS

A. Idowu Olayinka

A Guide to Preparing Geoscience Research Proposals

A Guide to Preparing Geoscience Research Proposals

A. Idowu Olayinka

A NAPE RESEARCH PUBLICATION

Mosuro

Contents

Foreword

Faculty members all over the globe are today engaged in geoscience research programs designed to advance knowledge of both natural and human environments. A research paper presents the results of investigations on a selected subject matter. Based on the researcher's thoughts and the facts and ideas gathered from a variety of sources, a research paper is a creation that is unique.

Current efforts in research are as numerous and varied as the number of active researchers. Geoscience research includes earthquake research, investigations of mineral resources around the globe, the risks of hazardous wastes, geochemical tracking and analysis, climate modelling and prediction studies, ecosystem dynamics, paleoclimate studies, and much more.

The Federal Government of Nigeria recently gave special grants for the refurbishment of laboratories and for the repair/maintenance of existing equipment for teaching and research in the universities. This is a step forward in creating and/or enhancing an enabling environment for research in our tertiary institutions.

The National Universities Commission (NUC) is also committed to funding research. In the geosciences in particular, grants are now available as a result of the efforts of the main petroleum geosciences and mining associations.

Professor A. I. Olayinka's *Guide for Writing Research Proposals in the Geosciences* is therefore a very timely effort that should be of immense help to people involved either in the search for research grants, or in the management of grants available for research. This is to say that the book is not only an asset to postgraduate students and scholars soliciting for grants from sources at home and abroad, but can also be of

great help to those whose duty it is to screen research grant applications and to manage such funds. Although geoscience professionals are the primary target audience, a closer examination of the book reveals that almost anyone interested in sourcing for grants in any area of academic research can benefit immensely from the contents of the book.

There are many approaches to research which is an essential part of every business and profession. There are also many ways to document the conclusions. In preparing a research proposal therefore, it is important to establish and consistently follow a format that is clear and concise. This book seeks to guide the research student in doing this, amongst other things.

This book is highly recommended for reading by both students and their respective project supervisors. It is also hoped that it will be a valuable resource and will help to identify some of the critical success factors in preparing a research proposal.

I predict that for a very long time to come this book will remain a very handy tool, not only for staff and students involved in postgraduate work in our universities, but also for those actively and sincerely involved in the search for, or in the management of research grants in Nigeria.

Professor K. Mosto Onuoha, FAS
Shell Professor of Geology and
Deputy Vice-Chancellor (Academic)
University of Nigeria, Nsukka
February 2005.

Preface

The need to develop a research proposal is often central to a successful and fulfilling career in the academia for a variety of reasons. First, a proposal may be part of the requirement for higher degrees (masters and doctorates). Second, a proposal may be required in order to get a stipend. Third, it may be required to finance a research proposal. Finally, such document helps in organising our thoughts and at the end, the researcher can see whether he/she has achieved the set goals. The initiative to write this book was made by top officials of the Nigerian Association of Petroleum Explorationists (NAPE). The idea was first mooted during the first quarter of year 2003. Later, the ideas further crystallised during that year's Annual International Conference and Exhibition held in Abuja in November, 2003. Inadequate funding is one of the major problems besetting the Nigerian university system and this has led to incessant strikes by the various staff unions on our campuses. In most cases the allocation from the proprietors (i.e. the Federal and State Governments, as well as private organisations) is hardly enough to take care of the recurrent and capital expenditures, and other pressing needs. Consequently, individual lecturers and professors are encouraged to seek complementary sources of funding in terms of Fellowships, as well as research and equipment grants from the various funding agencies. If this could be carried out successfully, we would be enhancing the teaching and research capabilities in the universities and similar research institutions. Apart from the teacher, students working on their dissertation and thesis topics can always benefit from the laboratory, field (including vehicles) and computational facilities acquired from such externally

x

funded research projects. To win these highly competitive research grants, it is obvious that the proposal submitted for funding must be outstanding while at the same time conform with the priorities of the prospective funding agency.

Experience has shown that while most scholars have received in-depth and advanced training in various disciplines culminating in their respective higher degrees, there is still the need to extend this reservoir of expertise to the art and science of writing research proposals. This is the primary objective of writing this book. Apart from discussing useful tips that can guide in preparing successful proposals, a listing of some funding agencies and their contact addresses has also been provided.

Although the main thrust of this book has been directed at geoscientists, I hope that scholars and professionals in other fields will also find it useful.

If this book is able to enhance the competence of researchers (especially students and staff) in securing grants and fellowships in the geosciences, the enthusiasm displayed by all who have contributed in one way or the other to the realisation of the publication would not have been misplaced.

Idowu A. Olayinka
January, 2005.

Acknowledgements

The author would like to thank the Nigerian Association of Petroleum Explorationists for giving him the challenge to write this book. In this regard, special mention must be made of the untiring efforts of top officials of NAPE, notably Mr Bayo Akinpelu (Chevron Texaco), Prince 'Kunle Adesida (Shell Petroleum), Mr Gilbert Odior (ExxonMobil) and Mr Mayowa Afe (Paradigm Geophysics). I would like to express my heartfelt appreciation to Professor K. Mosto Onuoha of the University of Nigeria, Nsukka, for writing the foreword. Several of the materials presented in this book have been obtained from the internet. I have also drawn inspiration from the somewhat extensive interaction I have had with many postgraduate students and teachers at the University of Ibadan, with whom I have on several occasions, had the opportunity to discuss aspects of the respective chapters, especially during the several workshops that we have organised on Research Methodologies and Writing Grant Proposals. To them all, I owe a debt of gratitude. I would finally like to thank my colleagues in the Department of Geology, University of Ibadan, Dr O. A. Ehinola and Mr Michael A. Oladunjoye, for reading drafts of the manuscript and offering suggestions which I feel improved the quality of this book.

Introduction

What is Research?

Research is the process of finding out something that we don't already know. Scientific research builds upon the extant knowledge base and it is *repeatable* and *verifiable*. It is an organised and systematic way of finding answers to questions. It is *systematic* because there is a definite set of procedures and steps which must be followed. There are certain things in the research process which are always done in order to get the most accurate results. It is *organised* in that there is a structure or method in going about doing research. It is a planned procedure, not a spontaneous one. It is focused and limited to a specific scope. *Finding answers* is the end of all research. Whether it is the answer to a hypothesis or even a simple question, *research is successful when we find answers*. Sometimes the answer is negative, but it is still an answer. *Questions* are central to research. If there is no question, then the answer is of no use. Research is focused on relevant, useful, and important questions. Without a question, research has no focus, drive, or purpose.

A widely accepted definition of research is that *it is a disciplined inquiry*. The generic characteristics of

this kind of inquiry —that research should be accessible, transparent and transferable — are useful criteria for shaping and evaluating our research:

- Accessible — a public activity, open to scrutiny by peers.
- Transparent — clear in its structure, process and outcomes.
- Transferable — useful beyond the specific research project, applicable in principles (if not specifics) to other researchers and research contexts.

Research can be considered to be a **process** built around three key features:

- Clearly articulated research questions to be addressed through the research, and a related series of objectives which will enable the questions to be explored and answered.
- The specification of a **research context** for the questions, and a rationale for why it is important that these particular questions should be answered or explored; this description of context should make clear what other research is being or has been conducted in this area, and what particular contribution this particular project will make to the advancement of creativity, insights, knowledge and understanding in this area.
- The specification of appropriate **research methods** for addressing and answering the research questions, and a rationale for the use of particular methods.

Further definitions of research are given in Appendix 1

Funding Research

Conducting research is an expensive activity. The researchers may have the ideas and the capacity to solve

problems, but often lack adequate funds with which to implement them. Consequently, researchers have to look for funds, usually from donor agencies, to finance their research. On the other hand, the funding agencies (agencies and Foundations) have the financial resources but not the other resources needed to create programmes. When we bring these two together effectively, the result is a dynamic collaboration (Bamiro *et al.*, 2003).

Grant makers are so vitally concerned about social problems, injustices or inequities that they are willing to commit their money to address these problems. In essence, they see a gap (or need) between what is and what ought to be, and their mission is to close this gap. The gap represents their view of the world. Successful grant writers are able to reflect the "priorities" of the sponsor. Too often, grant applicants focus on their own need for funds instead of matching their projects with the sponsor's priorities. One should select sponsors that share one's view of the world and tailor the research proposals to them. *Sponsors view grants as investments in an improved future.* Proposals are funded when they express the same priorities shared by the sponsor. Projects are rejected when they do not precisely reflect the priorities of the sponsor.

It is important that the research must be of value. This may include:

- Practical value in solving problems.
- Value to policy development.
- Contribution to theory.
- Contribution to body of knowledge within discipline.

Funders often specify the nature of the "value" they are looking for in research.

Getting a grant is hard work. There is a lot of competition for the meagre resources available from donor/funding agencies and this imposes very high standard of evaluating the application for funding of research proposals received. Grants are "free" in that you do not have to pay back the money. However, if you are awarded a grant you may be required to provide periodic program and/or financial reports to the funding organisation. The researcher needs to follow a step-by-step process in the search for funds. This takes time and persistence to succeed. After you have written a proposal, it could take as long as a year to obtain the funds needed to carry it out.

What is A Research Proposal?

A proposal is a statement or planning document of intent which shows how a study would be executed (Mouton and Marais, 1996). In other words, you have to lay out the details of your plans as well as a sales document for someone else's review or approval. The approving body or person might be an instructor/lecturer, or a funding agency whose resources (time or money) you intend to spend (Babbie and Mouton, 1998). As it is with every rational man or venture, resources have to be judiciously expended on projects that will realise the organisation's goal as well as benefit or reach the end user of the product. It is in this sense that the supervisors or assessors are concerned with how their resources would be utilised and the extent to which the programme being proposed meet their need and benefit the end user of the outcome (findings).

Research proposals are among the most important documents produced by academics because research, reputation, publication, promotion, and career success depend so much on external funding (Edlund, 2003; Sanders, 2003). The proposal is the beginning of the research process, but many students are initially intimidated because they have never written anything like it before. Research proposals are often difficult for students to start because some of the work must be done, or at least explored, before the proposal can be written.

The proposal is usually not written in the way it will be read finally. For example, the abstract, which is the first main section, is usually written last.

In writing a project proposal, a researcher will need to answer the following questions:

- How do I prepare a project proposal?
- What is a project proposal?
- What is the outline for a project proposal?

These issues are addressed in this book.

Purposes of Research Proposals

Research proposals serve the following purposes:
- To convince others of the value of your research.
- To demonstrate expertise.
- To demonstrate competency.
- To serve as a contact.
- To assist you as a planning tool.

It is, therefore, quite clearly of considerable importance that the proposal should convey a favourable impression

of the project and illuminate the researcher's ability to handle the subject.

- Does he/she know the subject sufficiently well?
- Is the area of study relevant to the contemporary issues of interest or the target of the funding agency?
- Does the plan and use of time convey an impression of the researcher's competence and ability to execute the project successfully?

These, among other issues, determine the quality of the proposal.

A good proposal requires:

- Effective library research.
- Clear thinking.
- Good planning.
- Familiarity with disciplinary knowledge.

It must:

- Address an important problem.
- Have clear achievable objectives.
- Contribute to fundamental advances in the field of study.
- Describe a well-defined feasible methodology and plan of study.
- Inspire confidence that project goals will be achieved.
- Anticipate potential weaknesses and deflect criticisms.

A professional proposal leads to professional research, new knowledge, a good publication and career advancement. A primary objective in preparing a funding

proposal is to produce a proposal that stands out from the tens of thousands submitted annually to:
- Government agencies.
- Private corporations.
- Foundations.
- Academic Committees.

Other Common Problems Faced by Students in Conducting Research

Apart from problems in writing research proposals, other common problems faced by students while conducting research include the following:
- Selecting a research topic.
- Gathering information.
- Analysing literature.
- Working with a supervisor.
- Managing time.
- Writing/presenting the research report.

Developing and writing a research proposal is an important and integral part of the research process. The various steps in this process are outlined in the next chapter.

Practice Questions

1. What are the common problems faced by students in conducting a research?
2. Define the term "research".
3. Why is it often necessary to write research proposals?

Chapter 2

Stages in Conducting Research

Stages in the Research Process

The following stages can be identified as part of the research process.

Stage 1 - Thinking about it.

Stage 2 – Preparing the proposal.

Stage 3 – Conducting the research.

Stage 4 – Writing the research paper.

Stage 5 – Sharing the research outcomes with others.

Stage 6 – Revising the research paper.

This book is largely concerned with Stages 1 and 2.

The "thinking about it" Stage

The following guides are suggested for a student during the "thinking about it" stage.

- Be inclusive with your thinking:
  * Do not try to eliminate ideas too quickly.
  * Build on your ideas and see how many different research projects you can identify.
  * Give yourself the luxury of being expansive in your thinking at this stage — you will not be able to do this later on.

* Try to be creative.
* Write down your ideas:
  * This will allow you to revisit an idea later on.
  * You can also modify and change an idea.
  * If you do not write your ideas they tend to be in a continual state of change and you will probably have the feeling that you are not getting anywhere.
    - What a great feeling it is to be able to sit down and scan the many ideas you have been thinking about, if they are written down.
* Try not to be overly influenced at this stage by what you feel others expect from you (your colleagues, your profession, your academic department, etc.).

  * You have a much better chance of selecting a topic that will be of real interest to you if it is your topic.

  * This will be one of the few opportunities you may have in your professional life to focus on a research topic that is really of your own choosing.
* Do not begin your thinking by assuming that your research will draw international attention to you. Instead, be realistic in setting your goal. Make sure your expectations are tempered by:

  * The realisation that you are fulfilling an academic requirement.

  * The fact that the process of conducting the research may be just as important (or more important) than the outcomes of the research.

> *   The idea that first and foremost the whole
>   research project should be a
>   learning experience for you.

If you can keep these ideas in mind while you are
thinking through your research you stand an excellent
chance of having your research project turn out well.

- Be realistic about the time that you are willing to
  commit to your research project.

  > *   If it is a four-year project that you are thinking
  >   about, admit it at the beginning and then
  >   decide whether or not you have four years to
  >   give to it.

  > *   If the project you would like to do is going to
  >   demand more time than you are
  >   willing to commit then you have a problem.

  > *   You should create a draft of a timeline.

  > *   Try using the six stages enumerated above
  >   and put a start and finish time for each.
  >   Post your timeline in a conspicuous place (e.g.
  >   above your computer   monitor) so that it
  >   continually reminds you how you are doing.
  >   Periodically update your timeline with new
  >   dates as needed.

- It can be most helpful at this early stage to try a
  very small preliminary research study to test out
  some of your ideas to help gain further confidence
  in what you would like to do.

  > *   The key is that it will give you a chance to get
  >   closer to your research and test out whether

or not you really are interested in the topic; you can do it before you have committed yourself to doing something you may not like. Take your time and try it first.

Initial Difficulties in Preparing Research Proposals

Preparing a research proposal is part of the research process. This process could be difficult for some students because:

- they are ill-prepared,

- they have the wrong perceptions about what research is,

- they have difficulty in formulating a research question,

- they have not undergone a creative thinking course,

- they do not read widely enough,

- they do not know how to use the Web for research (or CD-ROMs and the library as well!),

- their supervisors do not themselves fully understand the research process and how to best explain it.

Before a beginner student starts to write a research proposal, it might be helpful to read through someone else's research proposal. Very often a real stumbling block is that we do not have an image in our mind of what the finished research proposal should look like. How has the other proposal been organised? What are the headings that have been used? Does the other

proposal seem clear? Does it seem to suggest that the writer knows the subject area? Can I model my proposal after one of those that I have seen? If you cannot readily find a proposal to look at, ask your supervisor, the chances are your supervisor has a file drawer filled with proposals.

Assuming you have done a good job of "thinking about" your research project, you are ready to actually prepare the proposal. *Those students who tend to have a problem in coming up with a viable proposal are often the ones who have tried to rush through the "thinking about it" part and move too quickly to trying to write the proposal.*

Before a student begins to write a research proposal, he/she should:

- Be familiar with other research that have been conducted in areas related to his/her research.
- Have a clear understanding of the steps that would be used in conducting the research.
- Have the ability to get through each of the steps necessary to complete the research project.
- Be motivated and have the drive to get through all of the steps in the research project.

Your proposal should fit into your life plan. You need to develop a strategic plan.

- A strategic plan is a road map for your life and it has three parts:

  - Where are you today?

  - Where do you want to be in the future (5, 10, 20 years from now)?

- How do you get from here to there?

A funding agency will wonder that if you accomplish your research objectives, are you better off for the effort? In this vein, the agency will expect that your proposal:

- Should advance you towards your life goals.
- Should be a stepping-stone to the next stage in your life.
- Should be compatible with your institution's goals.
- Should represent a contribution to society at large.

Choosing a Research Topic

In general, students need to start with a topic area or focus, conduct some database searches and scouring of bibliographies, and begin reading journal articles and books. They should look for issues, questions, and gaps in the knowledge of the field. Initially the reading is fairly broad, but the focus should continue to narrow until the student is ready to formulate a research question. Do not try to have your research cover too broad an area. You may think that this will distort what you want to do; this may be the case, but you will be able to do the project if it is narrowly defined. Usually *a broadly defined project is not feasible*. By defining too broadly it may sound better to you, but there is a great chance that it will be unmanageable as a research project. When you complete your research project it is important that you have something specific and definitive to say. This can be accommodated and enhanced by narrowly defining your project. Otherwise you may have only broadly based things to say about large areas that really provide little guidance to others that may follow you. Often, the researcher finds that what he/she originally thought to be a good research

project turns out to really be a group of research projects. Do one project for your dissertation and save the other projects for later in your career. Do not try to solve all of the problems in just one research.

Once a question has been posed and a working title considered, further reading is necessary to provide the context of the study. It also should be noted here that the aims of the study would begin to crystallise from this stage onward. This preliminary write up in itself does not constitute an adequate literature review. Babbie and Mouton (1998) referred to this exercise as *preliminary scanning of literature*. It must be emphasised here that the currency/relevance of the topic and the supervisor's interest/bias are of tremendous importance in terms of the successful completion of the study at this stage.

In choosing a research topic the following points should be taken note of:
- It must be research.
- It must be a compeletely new research topic.
- It must be significant.
- There should be no doubt that the research topic can be handled effectively.
- It must lend itself to a viable research plan.
- You must have the facilities to accomplish the research.
- It should fit into your strategic plan.

Now that we have got some idea as to how to arrive at a suitable research topic some of the steps involved in the planning stage of writing a grant-winning proposal are discussed in the next Chapter.

Practice Questions

1.   Discuss the stages involved in conducting research.
2.   What are the steps to take in choosing a research topic?

Chapter 3

Planning to Write Grant Proposals

One major goal in grant proposals is to persuade granting agencies that they should invest their resources in us, rather than other researchers. The factors that come into play include the following:

- How we conceptualise our projects.
- How we formulate persuasive and elegant arguments.
- How well we understand the relationships between granting agencies and grant proposers.

We must plan to write elegant and competitive grant proposals. Inadequate planning results in grant proposals that do not get produced, or that get produced in such a way that they emerge as grant proposals, and not competitive grant proposals. We can work to minimise these types of problems by thinking of a grant proposal as nothing more than a product. We plan to produce a high quality product in a timely way.

Selecting and Prioritising Research Projects

The first step in preparing a grant proposal is deciding what work is to be done. Most researchers have a good

idea of what work is required to help advance our disciplines. We are usually more concerned with selecting and prioritising from a large number of research goals than we are with generating ideas for work.

A — Generate Ideas
B — Letter of Intent
Concept Letter
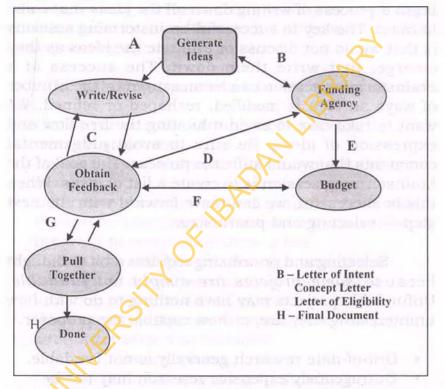Letter of Eligibility
H — Final Document

Fig 1. Illustration of the Various Steps Involved in Developing a Research Proposal.

Researchers get their ideas from many different places, including:

- Observation of the world.
- Concern with theory.
- Previous research.
- Practical concerns.
- Personal interest.

Nonetheless, there are times when our own well-spring of ideas might run dry and we could find ourselves looking for ideas for competitive grant proposals. In such cases, we may need to brainstorm with other colleagues and lay out the problem before the group. You should begin a process of writing down all the ideas that come to mind. The key to successful brainstorming sessions is that we do not discuss or evaluate the ideas as they emerge; just write them down. The success of a brainstorming session can be measured by the number of ways an idea is modified, reshaped or refined. We want to take care to avoid inhibiting the free flow and expression of ideas. Be sure to avoid judgemental comments that would stifle the process. The goal of the brainstorming session is to create a list of ideas. When this is successful, we can move forward with the next step — selecting and prioritising.

Selecting and prioritising requires a bit of thought because *some projects are simply not fundable.* Unfundable projects may have nothing to do with how uninteresting they are, or how capable the proposer.

- Out-of-date research generally is not fundable.
- Outrageously expensive research may not be fundable.
- Trivial activities rarely attract funds.
- If an agency has already granted funds for another individual or group to do the work in our proposal, it is unlikely that more money will be invested in that area.
- Fundability relates to the needs of granting agencies.

If our projects do not meet the needs of a granting agency, they will not be funded.

We need to select and prioritise our potential projects analytically. There is nothing to be gained by planning, writing and submitting grant proposals that are unfundable because they do not address the needs of any granting agency.

The following tips should be considered at this stage:

- Clarify the purpose of your project and write a mission statement.
- Define the scope of work to focus your funding search.
- Determine the broad project goals, then identify the specific objectives that define how you will focus the work to accomplish those goals.
- Decide who will benefit. Benefits may extend beyond the direct beneficiary to include the audience, other institutions, etc.
- Draft project outcomes in measurable terms.
- Draft a timeline that includes:
  - * the planning phase,
  - * the period of searching for funds,
  - * proposal writing, and
  - * the intended project start date.
- Periodically update the timeline as you learn more about submission deadlines, award timetables, etc.

Identifying the Right Funding Sources

Funding agencies are charged with dispensing funds to people and organisations. In other words, *granting*

agencies need to award grants. On the other hand, researchers (students and staff) are often required to write grant proposals in order to obtain funds to do research. There is, therefore, a special relationship between granting agencies and successful grant proposers. The values and needs of granting agencies come into close alignment with the values and needs of grant awardees, in that the agencies need to award money to people and organisations who can meet the value and needs of the granting agencies.

University staff and students compete in an intellectual arena for intellectual rewards such as recognition and prestige, rather than money, while competition for research funds is about obtaining means to reach a specified goal. As a general rule, we can increase our competitive postures by understanding the relationship between granting agencies and individuals who are funded by granting agencies. We need to get used to the idea that *most granting agencies do not care much about our teaching and research activities. What they do care about is meeting their own needs in a way consistent with their own values*. Consistency with an organisation's values can be quite important.

Some agencies hold part of their expendable funds for certain categories of individuals, such as women. Some agencies set aside funds for younger scientists, or scientists who are still within a few years of having completed their Ph.D. What may appear to be nothing more than a list of the interests and policies of any given granting agency is actually a synopsis of the agency's values. For example, the mission of the National Institute of Health (NIH) is *to improve the health of the people in the U.S.* By thoughtfully considering

our own values and the values of the agencies we are interested in approaching with a grant proposal, we make two gains. First, we avoid writing proposals that will not come to fruition. Second, we hone our competitive edge by including appropriate statements that show how our values match the values of the agency. Here is an example. It is a policy (read value) of the NAPE-UAP Grants-in-Aid to foster research in the geosciences by providing support to undergraduate and graduate students in the earth sciences whose research has application to the search for and development of oil, gas, energy-mineral resources, hydrogeology and related environmental geology issues. The following comment would do nicely in a grant proposal submitted to NAPE for possible funding:

"The University of Ibadan is highly committed to this research programme as shown by the recent acquisition of a workstation with state-of-the art computing facilities through benefaction from the Chevron-Texaco Alumni Subsurface Resource Center in the Department of Geology".

We can put specific language into our grant proposals with the overt goal of showing how our research programmes fit into the value systems of granting agencies.

The points to note include the following:

- Values held by a granting agency influence the selection of grant proposals that will be funded.
- Our values can influence what funding we are willing to accept.
- Thoughtful attention to values can be a competitive tool because we can indicate how our values and

the agency's values are compatible. Ask yourself:
* What values do this agency hold?
* How does this proposal support those values?

Agencies award grants to individuals and organisations who will carry out work that meet the needs of the agency. In selecting from a number of proposals, agencies tend to view with suspicion words such as interesting, thought-provoking, stimulating, exciting, spellbinding, tingling, electrifying, novel, important, significant and ground-breaking. These modifiers may accurately represent our projects, but the agencies do not care.

From the perspective of an agency, the only real question is: does the project address our needs? It does not matter that we believe our project is important, novel, and thought-provoking. What we believe is not the point to a granting agency. The agency does not care how much we enjoy our work.

Lecturers and professors often have to attract funds in order to carry out their research and also to attract promising postgraduate students who may otherwise not be able to support their research work. The situation can become desperate. On the other hand, it does not speak badly of granting agencies to emphasise that our needs do not figure prominently in their granting decisions. It is a fact of virtually all granting arenas: *granting agencies award funds to achieve the goals of the granting agencies in a way consistent with their values*. Recognising this point can help us design grant proposals.

- It does not do to address the intellectual curiosity of grant reviewers:
    * They do not have time or energy to be curious.
    * They do not care about our interests.
- It does not do to describe what we need; the proposal reviewers do not have the time to care what other people and organisations need. Reviewers are charged with selecting proposals that meet the agency's needs in a manner consistent with the agency's values.
    * This puts the responsibility on us to look carefully at the work we want to do and to look carefully at the agencies we want to approach with proposals.
- If we know what we really want to do, and we know the needs of one or more agencies, we can work to match what we want to do with an agency's needs.
- There are a couple of ways to work to achieve the match in needs and values that result in successful grant proposals.
    * One is to consider a number of granting agencies, determine what they need, then select the agencies whose needs match our interests.
    * The other is to develop our proposals so that it becomes plain that what we wanted to do all along fits perfectly with an agency's need.

Very often the first part leads into the second. Taking the first path, we scan grant proposal guidelines from all appropriate agencies, NAPE, AAPG, SEG, EEGS, US Geological Survey, National Science Foundation, Department of Energy, Geological society of London, etc., and eliminate some agencies. It doesn't take long to eliminate certain agencies because there is no

possibility of matching our interests and their needs. In this process of considering the guidelines of granting agencies, it may take a little more thought and time to eliminate some agencies that may or may not have needs in our interest areas. If we have often looked at proposal notices, proposal requests and journal advertisements and wondered "would my interests address their needs?" here is where a letter of inquiry, describing our interest, can help. The response helps us decide whether we should add the agency to our list of possibilities, or eliminate it without further work. Some of the foundations that support research in the geological sciences are listed in Appendices 2 to 4.

Foundations, government agencies, corporations and non-profit organisations are all potential research funding agencies. Some of the resources available to assist your funding search include:

- Foundation centres.
- Computerised databases.
- Station development offices.
- Publications.
- Public libraries.

Unsolicited proposals are created by the fund seeker (i.e. researcher). Other opportunities are created when the funding source offers specific programmes that solicit proposals. While identifying possible funding sources is not particularly difficult, the challenge lies in knowing what to do with the information once you have it.

There are steps to take after you identify a potential sponsor and before you submit your proposal,

that will significantly improve your chances of getting funded.

- Do not limit your funding search to one source.
- Pinpoint program approaches, interests and priorities of the funder.
- Make direct contact with funders to support projects like yours.
- Request proposal guidelines and a list of previously funded projects.
- Identify a programme officer in your area of interest. Contact the programme officer after you have studied the programme guidelines carefully and you have additional questions. A programme officer may:
  * Help determine the closeness of fit between your area of interest and their organisation.
  * Act as a sounding board for your ideas.
  * Help you define a research problem.
  * Advise you on a methodology to reach the desired objectives.
  * Put you in touch with others working on the same theme to develop mechanisms for research collaboration.
  * Suggest other unannounced programmes or unsolicited funds available to support your project.
  * Review the project proposal prior to submission of the final version.
- Unless specified, inquire about the maximum amount available and the average size and funding range of awards.
- If technical assistance, including a review of proposal drafts are available, use them.

- Inquire about how proposals are reviewed and how decisions are made.
- Inquire about budgetary requirements and preferences.
    - *   Are matching funds required?
    - *   Is in-kind acceptable as a portion of applicant's share?
    - *   What may be counted as in-kind, and how might it be applied?
    - *   Learn about payment processes, including cash flow.
- Remember, the contacts you make may prove invaluable, even if not for now.

Communicate with the Funding Agency

You should learn all you can about how the funding agency works, what their review process is and what constraints they operate under.

- Talk to the person in charge:
    - *   Every funding organisation will have a program officer who will be in charge of your proposal. Most organisations encourage proposers to talk to the person in charge. NSF and NASA program officers, including proposers, say that this may be the most important step a new proposer can take.
- Learn the system:
    - *   Always take the opportunity to review proposals or to serve on a review panel when you get the chance. Panel service in particular can be very educational. There is nothing like reading thirty proposals to help you understand how a good proposal should be structured and written.

- Understand the timing and constraints:
  * Try to get a feel for when the best time is to submit a proposal for the particular organisation. Even the best proposal is doomed to fail if it comes in after the deadline. However, some deadlines may not be rigid. It helps to call and ask, particularly if there is a good reason for being late — such as the late award of a large block of observing time.
- Tailor your project to the amount of money available:
- It is very counterproductive to submit a proposal for half an organisation's annual budget. On the other hand, be sure not to describe a $100,000 project if you are asking for $20,000. Scale your project to the available funding. Be innovative. Get promises of resources from other sources so the funding organisation will feel it is investing in a worthy research project.
- Follow up:
  * If you have spent the effort to understand the review system, you will know when you should follow up with a phone call asking about the progress of the proposal. Be sure to offer to answer any questions or misunderstanding which may have arisen. Even the best proposals may be misunderstood by one or more of the reviewers. Such contact can be invaluable in straightening out misconceptions and faulty assumptions on the part of the reviewer.

A funder might have a two-stage application process: letter of intent and the formal application. Only those applicants successful at stage one will be invited

to submit a formal application. The letter of intent or inquiry letter is also used when targeting Foundations and corporations as either a screening device or as the proposal itself. Check if the funder has specific criteria for the letter of intent. The letter of intent is usually short, often only two to four pages; it is more challenging to write than a long proposal.

Acquire Proposal Guidelines

Guidelines usually tell us about:
- Submission deadlines.
- Eligibility.
- Proposal format:-
  * Award levels forms.
  * Margins.
  * Spacing.
  * Evaluation process.
  * Restrictions on maximum number of pages, etc.
- Review timetable.
- Budgets.
- Funding goals and priorities.
- Award levels.
- Evaluation process and criteria.
- Whom to contact.
- Other submission requirements.

In addition,
- Read the guidelines carefully, then read them again.
- Ask the funder to clarify your questions.

Know the Submission Deadline

- Plan to submit your proposal on or preferably before the deadline.

- Be realistic about whether you have time to prepare a competitive proposal that meets the deadline.
- Know the funder's policies on late submissions, exceptions and mail delays.
- Find out how the funder will notify you about the receipt and status of your proposal and factor this information into your timeline.

Determine Personnel Needs

Identify required personnel both by function and if possible, by name. Contact project consultants, trainers and other auxiliary personnel to seek availability, acquire permission to include them in the project and negotiate compensation. Personnel compensation is important budget information.

Update your Timeline

Now that you know about submission deadlines and review timetable, you should update your timeline. Factor into your schedule time to:

- Write multiple drafts.
- Gather relevant and permissible materials.
- Prepare an impartial critique of your proposal for clarity, substance and form.

Some skills that a researcher needs to develop while making a grant application are discussed in the next chapter.

Practice Questions

1. Give reasons why some projects may not attract funding.
2. Illustrate the steps involved in developing a research proposal.

3.   How would you identify the right funding
      source(s) for a research topic you have conceived?

Basic Considerations in Writing Grant Proposals

Clarity in Writing

Every person who has ranked proposals emphasises that clear, uncomplicated exposition of the proposed research is the single most important factor which separates good proposals from bad (Boyce, 1993). The following suggestions are universally recommended by knowledgeable and successful proposal writers, but they assume that you can write clear expository English. If you use the passive tense, write long sentences so as to improve your writing first.

(a) Give yourself time:

- Allow enough time to do a good job.
  * All successful proposal writers say that *it takes time to generate high quality proposals.*

(b) Be organised:

- Write logically and clearly.
- Make an outline of the points you want to make before you start, and then join them together in a coherent fashion.

(c)   Give a broad picture:

- Explain what you are doing and why it is important.
- Provide a background which places your project in context.

(d)   Write for your audience:

- Guide the reviewer to the key points.
- Don't assume the reviewer will know your particular field of geoscience.
  - *   Most reviewers will be from outside your field.
  - *   Try to put yourself into the mind of the reviewer.
  - *   Answer the questions you would have if you were reviewing the proposal.

(e)   Highlight your research:

- Explain why your approach to the problem is appropriate and what resources you will need.
- Demonstrate that you have the time and skills to complete the project.

(f)   Include your qualifications:
- Establish that you know what you are doing.
- Include relevant references and write clearly.
- A person reviewing the proposal will not want to have to obtain the reference and read it in order to really understand your proposal.

  If a reference is unpublished, or really vital to understanding your proposal, include a reprint with the proposal.

(g)   Get an external opinion:
- Finally, show your proposal to one or more colleagues for comments.

- Ask them for an honest assessment of its strengths and weaknesses.
- Listen to their comments and revise the proposal accordingly.

Mechanical Details

Take care of the administrative details. Don't give someone the opportunity to dismiss your proposal because you failed to follow instructions.

(a). Restrictions — Many programs are restricted to certain areas of study, certain classes of applicants (e.g. students, people with a doctorate degree, etc.) Be sure you qualify.

(b). Deadlines — Some programs have deadlines, some take proposals at any time. Many programs, particularly at NSF, which have no official deadlines, are more likely to be funded if the reviews of your proposal are complete and the project is ready to be funded early in the fiscal year before all the money in the program budget is committed to other projects.

(c). Follow Instructions — Make sure your proposal incorporates all requested information.

Readability

Reviewing proposals is a tedious job. Put yourself in the reviewer's shoes and do what you can to make it easier.

(a). Submit a neat proposal — The physical appearance of your proposal is often used by the reviewers to judge your scientific ability. A sloppy proposal may be taken to indicate that your science may also be sloppy.

(b). Spend time to make a good summary of the proposal. In a panel review process in particular, the summary may be all that some reviewers will have time to read.

(c). Use proper font size — Do not use a small font to squeeze more words on a page. Reviewers hate that because it makes the proposal hard to read. Instead, cut back on the words.

(d). Keep the proposal short — A shorter proposal will have a bigger impact on the reviewers. In   no case should you exceed a page limit (if one is given). If auxiliary information is absolutely vital to show that you have the specialised skill or knowledge to do the proposed research, add it in an appendix.

Scope of Project

Do not try to do too much:

- Think about what you plan to do and keep it within bounds.

(a). Avoid unrealistic estimates:

- You can be sure that some of the reviewers will have experience in your field and will lower their rating if you promise more than you can achieve.

(b). Keep the project focused:

- Clearly state your objective and stick to it. Do not add unnecessary or tangential material which will only confuse the reviewer.

(c). Less is more:

- Do not make the mistaken assumption that several projects are better than one, or have a better chance of being funded. The reviewers will react negatively to being presented with a patchwork of unrelated projects.

Now that we have described the expertise involved in identifying potential funding agencies and the skills expected in writing our grant proposals, the next chapter will deal with the format of a research proposal, and is the most detailed section of the book.

Practice Questions

1. What are the basic considerations in writing grant proposals?
2. How would you define a realistic scope for your research project?

Format of a Research Proposal

Table 5.1 Typical Sections of a Research Proposal.

Section	Description
Title	Specific description of project
Abstract	Brief description of what, why and how
Introduction, Problem Statement or Literature Review	Describe major studies, show importance
Research Question	Focuses on an issue, a problem, a gap in the knowledge of the field
Goals and Objectives	What will the study accomplish?
Preliminary Studies	What is the ability of you and your research team to carry out the proposed studies?
Research Design and Methods	How will you investigate the question? What will you do and how will you do it?
Expected Results and Impact	What do you expect to discover?
Institution and Personnel	What is the professional expertise of the researcher(s) who will undertake the project? What is the existing research capacity of their institution(s)?
Timeline	When will you start? How long will each step take?
Budget	What do you need and how much will it cost?
Conclusion	What is the future direction of the project?
Curriculum Vitae or Résumé of Collaborators	Brief information about the investigators
Participating Agencies	Any information about the institutional base and the expected contribution?
Letter of Support	Have you sought and obtained cooperation of relevant officials?
Works Cited	What sources were used?
Appendices	Are there other useful materials not already included in the body of the proposal?

The major components of a research proposal are presented in Table 5.1.

Covering Page

If the funding agency does not provide a cover form or format, create a simple cover. Include the following:
- Name of the funding agency.
- Applicant's organisation.
- Date of submission.
- Project title.
- Proposed project period.
- Amount requested.
- Project director's name and signature.
- Name and signature of the organisation's authorised representative.

A good proposal should have a good title and it is the first thing to help the reader begin to understand the nature of your work. Use it wisely. Work on your title early in the process and revisit it often. It is easy for a reader to identify those proposals where the title has been focused upon by the student.

In choosing a title for the project, consider the following points:
- The title, as a label, should be clear and unambiguous.
- Think of your title as a mini-abstract.

A good title should paint a quick picture for the reader of the key idea(s) of your project.

- Do not attempt to use the title as an abstract of your entire proposal.
- The words you use in your title should clearly reflect the focus of your proposal.

- The most important words should come first, then the less important words.

- You should include *key words* that will help other researchers find your work in the future.

- Try to remove words from your title that are not relevant to understanding it.

- Try and use only a single sentence for your title.

  * If the sentence is getting too long, try removing some words.

  * When all else fails, try using a two part title, with the parts separated by a colon (use this only as a last resort!).

In Table 5.2, an attempt has been made to present an improved version of the title in the left column, in the right column. In the first, the phrase "Investigation of the" could be removed from the title without detracting from the essence of the research. In the second title, it is possible to use a single sentence instead of two; moreover, although the study area is often referred to as Benin Basin, a more widely used description of the study area in the literature is Dahomey Basin, for which reason it is preferred. A careful perusal of the third paper (Bala and Ike, 2001) indicates that some key words in the main body of the paper, such as electrical soundings and lithological logs, are not reflected in the original title. This lapse has been taken care of in the suggested modification which is more informative, albeit with a slight increase in the word count. Similar arguments can be made for the fourth and fifth examples.

Table 5.2 Examples of Possible Modification to the Title
of some Geoscience Research Projects

S.No	Original title	Modified title	Key words
1	Investigation of the Stratigraphy and Hydrocarbon Potential of the Opuama Channel Complex, Western Niger Delta	Stratigraphy and Hydrocarbon Potential of the Opuama Channel Complex, Western Niger Delta (Adejobi and Olayinka, 1997)	stratigraphy, hydrocarbon potential, Opuama Channel, western Niger Delta.
2	Reservoir Characterisation from Outcrop and Subsurface Data: A Benin Basin Example	Reservoir Characterisation of the Eastern Dahomey Basin using Outcrop and Subsurface Data (Koledoye, 2004)	reservoir characterisation, outcrop, subsurface data, eastern Dahomey Basin
3	The Aquifer of the Crystalline Basement Rocks in Gusau Area, Northwestern Nigeria (Bala and Ike, 2001)	Use of Electrical Soundings and Lithological Logs in Identification of Aquifers in the Crystalline Basement Rocks in Gusau Area, Northwestern Nigeria	crystalline basement, aquifers, lithological logs, Gusau
4	Porosity and Permeability Prediction from Wireline Logs using Artificial Neural Networks: a North Sea Case Study (Helle *et al.*, 2001)	Using Artificial Neural Networks to Predict Porosity and Permeability from Wireline Logs in the North Sea	porosity, permeability, artificial neural networks, wireline logs, North Sea
5	Geoelectrical Investigation of Sites along the Proposed Ibadan-Ilorin Dual Carriageway (Olayinka and Oyedele, 2001)	Geoelectrical Surveying for Site Investigation along the Proposed Ibadan-Ilorin Dual Carriageway.	geoelectrical survey, site investigation

An effective title not only arouses the reader's interest, but also predisposes him/her favourably towards the proposal.

Table of Contents

Even if the guidelines don't specifically mention a table of contents, it is a good idea to include one for proposals over five pages long

Abstract (also called Project or Executive Summary)

In grant proposals the abstract is particularly important even if it is not scored because the abstract is what reviewers remember when they are sorting through proposals. It should clearly and concisely indicate:

- What is going to be done.
- Why it is important.
- Who is going to do it.
- How it is going to be done.

In other words, it should reflect the contents of the entire application and it should present them in the order in which they appear within the application. The abstract should serve as a "stand alone" piece, because it may be the first and only part of the application that some reviewers read. Consequently, it should be revised until it is a well-written, accurate summary of the entire proposal. The typical length is 150-250 words.

The abstract is similar to the specific aims, which causes some confusion. Beginning investigators are sometimes reluctant to include the aims in their abstract since they appear shortly after in the specific aims. But it is important to include them in both sections and to use exactly the same wording. The abstract should also

include an overview of the methodology, whereas this is not necessary in the aims.

Although the abstract appears at the beginning of the proposal, it should be written after you have finished the rest of the research plan.

Be certain to include.
- Problem:
  A brief statement of the problem or need you or your institution has recognised and is prepared to address (one or two paragraphs).
- Solution:
  A short description of the project, including what will take place and how many people will benefit from the programme, how and where it will operate, for how long, and who will staff it (one or two paragraphs).
- Funding requirements:
  An explanation of the amount of grant money required for the project and what your plans are for funding it in the future (one paragraph).
- Organisation and its expertise:
  A brief statement of the name, history, purpose, and activities of your institution, emphasising its capacity to carry out this proposal (one paragraph).

Background Information/Statement of the Problem

The reading process described above will ultimately provide the material for the section that is variously called "introduction", the "problem statement", or the "literature review". The student needs to take good notes and accurately record bibliographic information. This section should cover the important studies in the field

and give the reader the sense that the writer is well-informed and that the study will be an important contribution. Cite previous projects and studies that are similar to what you are proposing. Show the funding agency that you know what you are proposing because you are familiar with what has preceded you. It is important that all sources be properly documented so that no suspicion of plagiarism is ever raised.

Try to be careful in your use of language. It can be very helpful to have a friend outside of your area of focus/expertise read your proposal to make sure that the language is readable, with a minimal use of jargon, trendy or "in" words, abbreviations, colloquial expressions, redundant phrases and confusing language.

Position your project in relation to other efforts and show how your project:

- Will extend the work that has already been done.
- Will avoid the mistakes and/or errors that have been made previously.
- Will serve to develop stronger collaboration between existing initiatives.
- Is unique since it does not follow the same path as previously followed.

It is essential to include a well-documented statement of the need/problem i.e. why is this project necessary?

- Use the statement of the problem to show that your proposed project is definitely needed and should be funded.

* What are the pressing problems that you want to address?

* How do you know these problems are important?

* What other sources/programs similarly support these needs as major needs?

- Check to see that the potential funding agency is committed to the same needs/problems that your proposal addresses. Clearly indicate how these problems that will be addressed in your project will help the funding agency in fulfilling their own goals and objectives. As you write, keep the funding agency in your mind as a "cooperating partner" committed to the same concerns as yours.

- Is there a special reason why you and/or your organisation are uniquely suited to conduct the project? (Geographic location, language expertise, prior involvements in this area, close relationship to the project clientele, etc.).

- Decide whether you can demonstrate that your programme addresses the need differently or better than other projects preceeding it.

* It is often difficult to describe the need for your project without being critical of competition nonetheless, you must be careful not to do so.

* Being critical of other researchers or institutions will not be well received by the funder. It may cause the funder to look more carefully at your own project to see why you

felt you had to build your case by demeaning others. The funder may have invested in these other projects or may begin to consider them now that you have brought them to their attention.

*   If possible, you should make it clear that you are cognisant of, and on good terms with others working in your field.

*   Keep in mind that *today's funders are highly interested in collaboration*. They may even ask why you are not collaborating with those you view as key competitors. So, at least you need to describe how your work complements but does not duplicate the work of others.

•   When you get to the Methods section of your proposal it will be important to refer back to the needs you have identified in this section (and show how your methods will respond to these needs).

•   Give the reader hope. The picture you paint should not be so grim that the solution appears hopeless. The funder will wonder whether an investment in a solution will be worthwhile. Avoid overstatement and overly emotional appeals.

•   Decide if you want to put your project forward as a model. This could expand the base of potential funders, models work only for certain types of projects. Don't try to make this argument if it doesn't really fit. Funders; may well expect you to follow through with a replication plan if you present your project as a model.

* If the decision about a model is affirmative, you should document how the problem you are addressing occurs in other localities. Be sure to explain how your solution could be a solution for others as well.

• It can really help gain funding support for your project if you have already taken some small steps to begin your project.

• This is an excellent section to have the reader begin to understand that an ongoing approach to the problem is essential (assuming that you are proposing a project that is ongoing in nature) and that short-term responses may have a negligible effect. This can begin to establish a rationale for why your project needs external funding — it seeks to provide a long-term response.

Literature Review

As already noted earlier, a literature review actually commences as soon as a topic is conceived. The rationale for this is clear as noted earlier but at this current stage of the study the need for a detailed review of relevant material on the subject is paramount in order for the researcher to know what other scholars have done and how/where they were done or executed. It would also assist the researcher to know how the current study would be different from earlier ones. It should be pointed out however, that literature review is meant to facilitate a critical analysis of the data emanating from the study. Information of other or earlier researchers is necessary to buttress or jettison the data from the field. In this way the reviewed works benefit the research conducted.

Similarly, an appropriate and relevant theory to guide the study is inevitable. Put differently and in a layman's view, no one builds a house without a plan. This is essentially the role theory plays in research. It directs or patterns the trend of discussion and thus structures our argument. What is expected of the researcher is to identify a relevant and appropriate theory and discuss in detail the theme and how it would be applied in the study. This also helps in the selection of the research method to be adopted in the course of the research. A good literature review generally contains an argument.

Purposes of Literature Review

A review of the literature serves the following purposes:

- Ensures that you are not "reinventing the wheel".
- Gives credit to those who have laid the groundwork for your research.
- Demonstrates your understanding of the theoretical and research issues related to your research question.
- Shows your ability to critically evaluate relevant literary information.
- Indicates your ability to integrate and synthesise the existing literature.
- Provides new theoretical insights or develops a new model as the conceptual framework for your research.
- Provides an integrated overview of the field of study.
- Helps establish a need for the research.
- May help clarify the research problem.

- Helps to demonstrate the researcher's familiarity with the area under consideration (theory and/or methods).
- Convinces your reader that your proposed research will make a significant and substantial contribution to existing literature (i.e. resolving an important theoretical issue or filling a major gap in the literature).

Skills Involved in Producing a Literature Review

Producing a literature review entails:

- Surveying a comprehensive range of existing material and sources in the general areas of your study.
- Selecting those that will be most relevant and significant for your particular project.
- Understanding and analysing the central findings and arguments.
- Synthesising the findings and integrating them into the research proposal.

With the ready availability of photocopying machines you should be able to bypass many of the hardships that previous researchers had to deal with in developing their literature review. When you read something that is important to your study, photocopy the relevant article or section. Keep your photocopies organised according to categories and sections and most importantly, photocopy the bibliographic citation so that you can easily refer to the material in your bibliography. Then, when you decide to sit down and actually write the literature review, bring out your photocopied sections, put them into logical and sequential order, and begin your writing.

How to Write a Literature Review

In writing a literature review:

- Indicate the ways in which the authors you are reviewing will be relevant to your research (information, theory and methodology).
- Demonstrate that you understand the similarities between these works and paradigms:
  - *   Where do they stand in relation to each other?
  - *   Where does your research stand in relation to them?
- The works that you refer to should reflect *recent scholarship* as well as those considered of *seminal importance*.
- Avoid fallacious arguments.
- Avoid excessive detail; succinctness gets rewarded.
- Budget your space. A quarter-page diagram should replace a page of text.
- Objectively assess the work of others and place them in proper perspective.
- Cite all of the relevant work:
  - *   Journal and conference papers (yes-yes).
  - *   Textbooks are generally a no-no; monographs are okay.
- If the study is cross-disciplinary or comparative you need to describe how the different areas of research can be drawn together in a meaningful way.

Questions to Help You in Compiling a Literature Review

- What are the broad bodies of literature that have relevance for your research topic (local and international)?

- What theoretical model(s) relate to your research topic?
- What theories, methods and results have previous researchers in your field produced? What is the history of your area of study?
- What are the most recent findings in your area of study?
- What gaps or contradictions exist among these findings?
- What new research questions do these findings suggest?
- What structure suits my literature review best?
- What should I leave out?

You are expected to demonstrate your understanding of your field by *critically analysing the pertinent work of other investigators* leading up to your proposed work.

- "Critical" does not mean negative, however.
- Critical means that you are able to appreciate the salient contributions of other scientists whose work serves as a foundation for yours.

The Don'ts in a Literature Review

The literature review is NOT:

- Part of the research project.
  - *   Although there may be an ongoing review of literature throughout the project, *funders expect a solid preliminary review to have been carried out before a proposal is submitted.*
- A bibliography.
- A series of descriptions of pieces of previous research with no apparent connection to each other or your project.

Problems with Literature Reviews

Most students' literature reviews suffer from the following problems:

- Lack of organisation and structure.
- Lack of focus, unity and coherence.
- Being repetitive and verbose.
- Failing to cite influential (seminal) papers.
- Failing to keep up with recent developments.
- Failing to critically evaluate cited papers.
- Citing irrelevant or trivial references.
- Depending too much on secondary sources.
- References are too many, too few, too old, as well as including wrongly placed citations.

Once you have identified the pivotal work leading up to yours, state explicitly what scientific questions other scientists have not yet answered about your field. This is often referred to as "gaps in our understanding". Next, suggest how your work will be structured to address these important questions.

The Research Question

The first step in developing research proposals involves finding a research question. Researchers get their questions from many different places, including:

- Observation of the world.
- Concern with theory.
- Previous research.
- Practical concerns.
- Personal interest.

The criteria for choosing a research question include the following:

- Access to information.
- Access to resources.
- Theoretical background.
- Value of research.
- Researcher's skills.
- Is the question big/small enough.
- External requirements.
- Overall probability of successful completion.
- Interest to researcher.

In choosing a research question:

- Remember that a broad research area is NOT a research question.
- Formulate a number of possible questions, and weigh up the pros and cons.

The proposal must reflect that the issues have been thought through. Ensure that the significance of your proposed work is clearly shown. This is not the same as showing that the problem to which your research relates is significant. A lot of investigators become confused about this distinction. For example, someone may argue that increasing hydrocarbon reserve is important to the economy of Nigeria. But this is a waste of precious space in that reviewers rarely question the significance of crude oil reserves to Nigeria's economy. Rather, what the reviewers are looking for is the impact of your research in increasing crude oil reserves.

Goals and Objectives

Try and differentiate between your goals and your objectives and include both.

- Goals are the large statements of what you hope to accomplish, they are usually not measurable. They create the setting for what you are proposing.
- Objectives are operational, tell specific things you will be accomplishing in your project, and are measurable.

The overall goal (sometimes called a long-term goal) should provide the reviewer with a sense of not only what you wish to accomplish in the proposed research, but how this fits into your future plans. It is particularly important for a young scientist to provide the reviewer with a sense of future direction in this statement. This is because when funding agencies commit to funding the proposal of a young scientist, they are also investing in that person's career. Therefore, give them a sense of where you are headed and how this proposal will move you in that direction.

Your objectives will form the basis for the activities of your project and will also serve as the basis for the evaluation of your project. Try to ensure that there is considerable overlap between the goals and objectives of the funding organisation. If there is not a strong overlap of goals and objectives then it might be best to identify a different funding organisation.

Present measurable objectives for your project. If you are dealing with "things" it is easier for them to be measured than if you are dealing with abstract ideas. Your proposal is easier for a prospective funding organisation to understand (and the outcomes are much more clear) if you describe your objectives in measurable ways.

Preliminary Studies

The preliminary studies section is the place to establish the ability of you and your research team to carry out the proposed studies. In science, the time-honoured way to demonstrate competence is by publications. Often, however, junior investigators are at a disadvantage in terms of the number of their publications.

It should be remembered that there are other ways to demonstrate competence, including pertinent prior work or training. Also, remember that it is appropriate to discuss previous related work by your collaborators. By far the most persuasive prior work by collaborators, however, is work that was undertaken by you and your collaborators as a team. If you and your collaborators have not yet had the opportunity to publish together, it can be helpful to try to develop a publication before your proposal is reviewed. You can then send in a supplement. A supplement is additional information submitted after the application has been submitted, but before it has been reviewed. However, as a general rule, remember to be considerate and keep supplements to an absolute minimum as your reviewers will be receiving it later in the review process.

A widespread misconception about the preliminary studies section is that it serves to demonstrate that you have completed some percentage of the proposed work and that you are now seeking funds to finish the study. This way of thinking misconstrues the purpose of the preliminary studies: grant funding is not a "reward" for a partially completed study. Rather, the point is to demonstrate that you can do what you propose to do. After all, if you have already performed one-third or

half of the study, the reviewers might well conclude that you can come up with the funds to finish it.

Research Design and Methods

The research design and methods section often comprises by far the longest section of the research plan; approximately half of the pages in the research plan are devoted to it. This fact underscores the importance of this component to your application. The purpose of the research design and methods section is to explain how you will carry out your specific aims.

As you begin to write this section, keep in mind its title: that is, it is called research design and methods, not simply methods. Beginning scientists are often confused about the distinction between design and methods, leading them to lump the two together. Discuss them separately: The design is the way in which you conceptualise your experiments, whereas the methods are a detailed discussion of exactly what you will do to carry them out. The design is often given a subhead called the rationale. The design section is relatively brief, particularly when compared to the methods, but it is inherently interesting in that it shows your reviewers how you think about your work. It tends to be creative; e.g. you could have designed your project in any number of ways, but you chose this one. Why?

The methods, by contrast, are straightforward but critical, as reflected by the number of pages allocated to them. Make sure you provide your reviewers with sufficient detail to evaluate your work. This is particularly important if you are proposing to develop a new methodology or a new technique. There should be a very clear link between the methods you describe in

this section and the objectives you have previously defined. Be explicit in your writing and state exactly how the methods you have chosen will fulfil your project's objectives and help deal with the needs/problems on which your proposal is focused.

The proposed research may be exploratory or highly structured, quantitative or qualitative. However, the methodology section should begin in all cases by defining the conceptual framework and theoretical frame of reference that will guide the research. The main explanatory and dependent variables should be identified and related one to another. In grant proposal writing, the methodology section is generally considered to be the most important section. Proposal reviewers want to know what you are going to do, and how you are going to do it, and this is most apparent in the methodology section. Flaws and potential problems will also be most visible here; the writer should anticipate problems and give fallback solutions.

A prospective funding agency will be looking at your methods to see what it is that you are proposing whihc will be new, unique and innovative. Make sure you clearly present the innovative aspects of your idea. Do not forget to include the collaborative relationships your project will be developing with other cooperating groups. A good way to show collaboration is in the methods that you will be using. How will the methods for your project encourage groups to join together in dealing with the issues/concerns your project addresses? Your methodology section should clearly indicate how the methods that will be used will allow the outcomes of your project to have value for others beyond your project.

The various types of analyses employed in geoscientific investigations and the required equipment are presented in Table 5.3. It should be pointed out that although these comprise most of the sophisticated instruments currently in use, the list is by no means exhaustive. It often helps to employ more than one technique in solving a typical geoscientific problem in order to ensure greater reliability of the data, more so when each technique will have its limitations.

Table 5.3 Typical Form of Analyses used in Geoscientific Investigations and the Required Instruments

S/No.	Types of Analysis	Data Set required	Instruments/ Facilities
1. a.	**Mineralogy** Petrographic	Core samples, ditch cuttings, thin sections and polished sections	Petrographic microscope, Scan Electron Microscope (SEM), polarising microscope, grinder, polisher, petrographic specimen.
b.	Clay Minerals	Core samples and ditch cuttings	X-ray Diffractometer (XRD)
2. a.	**Sedimentology** Granulometry (textural and grain size)	Core samples	Rotary shaker, complete sieve set
b.	Petrophysics	Composite logs	Log digitiser
c.	Heavy mineral	Core and ditch cuttings	Reagents and laboratory wares

3 a.	**Biostratigraphy** Palynology/ palynofacies	Core samples, ditch cuttings, sidewall core descriptions, composite logs	Stereomicroscopes with microvideo system, binocular microscope
b.	Foraminiferal	Same as above	Same as above
c.	Nannofossil	Same as above	Same as above
4 a.	**Geochemistry** Major and trace elements	Core samples, ditch cuttings, formation fluid samples	Atomic Absorption Spectrometry (AAS), X-Ray Fluorescence (XRF), Inductively Coupled Plasma Mass Spectrometry (ICP-MS), Ion Chromatography, Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES)
b.	Rare earth elements	Core and ditch cuttings	Instrumental Neutron Activation Analysis (INAA)
c.	Isotopic and chronological	Core samples, ditch cuttings, formation fluid samples	ICP-MS
d.	Organic geochemical	Core samples, ditch cuttings, formation fluid samples	Rock-Eval Pyrolysers, gas chromatogram/ mass spectrogram

5	**Geophysical**		
a.	Gravity survey	2D and 3D	Gravimeter
b.	Magnetic survey	2D and 3D	Proton magnetometer, G856M Magnetometer, Numis Plus
c.	Seismic survey	2D and 3D	Work Station, seismogram, simulation softwares
d.	Resistivity	2D and 3D	Resistivity meter, multi-electrode imaging system
e.	Remote sensing	Image map	Geographical Information Systems

What the Research Design and Methods Section Does

- The research design and methods section shows the reader how you are going to set about looking for answers to the research question (including, if appropriate, materials and methods to be used).
- It must include enough detail to demonstrate that you are competent and the project is feasible.
- The proposed methods must be appropriate to the type of research.

What the Research Design and Methods Section should Contain

- Hypothesis.
- Research design.
- Sampling.
- Measurement instruments.
- Data collection procedure.
- Data analysis.
- Potential limitations of the proposed work.

A hypothesis is an educated prediction about the outcome of your study. The most powerful hypotheses are based on pilot studies. The hypothesis must be testable. Do not simply rewrite the objective of your proposal as a hypothesis. e.g. "We propose to use the krigging method to determine permeability in a part of the eastern Niger Delta. Our hypothesis is that by using the krigging method we can estimate permeability in the eastern Niger Delta". This type of simplistic restatement of work is not a hypothesis in the scientific sense of the word. The point of your research proposal should be to develop experiments designed to test your hypothesis.

The question often arises as to how many hypotheses are appropriate. One strong hypothesis is fine. Some investigators have a hypothesis underlying each aim. That is also fine. The question of how many hypotheses to include should be driven by the nature of the questions you seek to answer.

The data analysis section should not simply consist of the names of the statistical tests to be performed, but should convey what types of data will be recorded, how they will be analysed, and what they mean in terms of your hypotheses. The absence of a detailed data analysis section is one of the most frequent criticisms made by reviewers.

Another very important part of this section is a discussion of the potential limitations of your proposed work as well as your plans for dealing with them. This section often focuses on problems of interpretation. You want to discuss any technical problems that may arise and what alternate plans you may implement. This is a sophisticated part of the proposal which should be reviewed carefully with a mentor.

Expected Results and Impact

Begin by defining the major outputs expected from the projects, while outlining plans for disseminating or implementing the findings of the proposed research. Examples of outputs include:

- Workshops and conferences.
- Reports and publications.
- New methodologies or technologies.
- Improved research skills.
- Institutional reinforcement.

Show how research results will be communicated to users and decision-makers. Discuss how research results are likely to be used. Identify the immediate or intermediate users of the results and show how they will be given access to the research results. Who will ultimately benefit if the project results are appropriately used?

The expected impact of research results can be discussed in reference to some or all of the following:

- Their potential use in other settings.
- Their contribution to existing technical and scientific knowledge.
- Policy formulation and implementation.
- Development processes at the local, national and regional levels.
- The needs of specific target populations.

Discuss any possible obstacles to the execution of the research and to the eventual use of the results. These may include possibilities of political or economic instability, expected difficulties in securing access to data, the difficulty of coming to categorical conclusions and the partial nature of the results for addressing specific development problems.

Institution and Personnel

Describe in detail the qualifications of key project personnel and describe the facilities already available or promised for performance of the project. Normally a résumé of your institution should come at the end of your proposal. Your natural inclination may be to put this information in front of the document. But it is

usually better to sell the need for your project and then your agency's ability to carry it out.

It is not necessary to overwhelm the reader with facts about your institution. In two pages or less, tell the reader when your institution came into existence; state its mission, being certain to demonstrate how the subject of the proposal fits within or extends that mission, and describe the organisation's structure, programmes and special expertise.

Describe the kinds of activities that the staff engage in. Explain briefly the assistance you provide. Describe the audience you serve, any special or unusual needs they face, and why they rely on your institution. Cite the number of people who are reached through your programme.

In concluding about information pertaining to your institution, cite your institution's expertise, especially as it relates to the subject of your proposal.

Timeline

It is important to convey that your research is feasible in the proposed time and that you have developed a logical plan for carrying them out.

Evaluation

An evaluation plan should not be considered only after the project is over; it should be built into the project. Including an evaluation plan in your proposal indicates that you take your objectives seriously and want to know how well you have achieved them. Evaluation is a sound

management tool. Like strategic planning, it helps an institution refine and improve its programme. An evaluation can often be the best means for others to learn from your experience in conducting the project.

There are two types of formal evaluation. One measures the product; the other analyses the process. Either or both might be appropriate to your project. The approach you choose will depend on the nature of the project and its objectives. For either type, you will need to describe the manner in which evaluation information will be collected and how the data will be analysed. You should present your plan for how the evaluation and its results will be reported and the audience to which it will be directed. For example, it might be used internally or shared with the funder, or it might deserve a wider audience. A funder might even have an opinion about the scope of this dissemination.

Sustainability

A clear message from funding agencies today is that grant-seekers will be expected to demonstrate in very concrete ways the long-term financial viability of the project to be funded and of the organisation itself. Most grant-makers will not want to take on a permanent funding commitment to a particular agency. Rather, funders will want you to prove that either your project is finite (with start-up and ending dates), or that it will make your institution attractive to other funders in the future. Evidence of financial sustainability is a highly sought-after characteristic of a successful grant proposal.

You should be very specific about current and projected funding streams and about the financial base of your institution. This is an area where it is important to have back-up figures and prognostications readily available, in case a prospective funder asks for these, even though you are unlikely to include this information in the actual grant proposal. Some grant-makers will want to know who else will be receiving a copy of this same proposal. You should not be shy about sharing information with the funder.

Budget

Budgets are cost projections. They are also a window into how projects will be implemented and managed. Well-planned budgets reflect carefully thought-out projects.

The factors used by funders to assess budgets include the following:
- Can the job be accomplished with this budget?
- Are costs reasonable for the market, or too high or low?
- Is the budget consistent with proposed activities?
- Is there sufficient budget detail and explanation?

Many funders provide mandatory budget forms that must be submitted with the proposal. Don't forget to list in-kind and matching revenue, where appropriate. Be flexible about your budget in case the funder chooses to negotiate costs.

Conclusion

Every proposal should have a concluding paragraph or two. This is a good place to call attention to the future,

after the grant is completed. If appropriate, you should outline some of the follow-up activities that might be undertaken as you prepare the funding agency for your next request. Alternatively, you should state how the project might continue, without further grant support.

This section is also the place to make a final appeal for your project. Briefly reiterate what your organisation wants to do and why it is important. Underscore why you need funding to accomplish it. Don't be afraid at this stage to use a bit of emotion to solidify your case.

Curriculum Vitae (or Résumé or Biographical Sketch) of Collaborators

Include a curriculum vitae for the project director and key personnel. Some funding agencies have a specific format for curriculum vitae and may specify a page limitation or that recent publications should be included. If no guidelines are mentioned, keep the curriculum vitae short — two to five pages is adequate.

Participating Agencies

At the time of submitting the research proposal, researchers should indicate their institutional base and the expected contribution of their institution to the research project. [Most agencies feel more comfortable where there is an institutional backing for the researcher(s). It is a form of insurance that the project will be executed. It is pertinent to note that there have been a few cases of researchers more or less abandoning projects after receiving the start-off grant.]

In cases where no previous collaboration has existed between the institution presenting the proposal and the funding agency, a copy of the document certifying the legal status of the institution should be attached to the proposal. Where requests for research funds from external sources require approval from the government, the head of the institution (such as the vice-chancellor) should submit a copy of the official documentation providing government clearance.

Letter of Support

Letters of support are often required from the highest level to show the donors that the cooperation of the relevant officials has been sought and obtained. In cases where the research will be carried out in collaboration with other institution(s), or the research funds will be administered by another party, the head of the institution submitting the proposal should submit a document certifying such collaboration.

It is necessary to give insight into the activities of the participating or collaborating institutions, highlighting in particular what the expected results can do to improve their operations and/ or improve capacity building.

Works Cited

References are a compulsory addition to the proposal. The style and punctuation of the references is usually left to the authors to decode in most cases, unless a particular format has been stipulated by the funding agency. References to manuscripts that have been accepted but not yet published should be designated by the journal, followed by the notation "in press".

Information from manuscripts submitted but which are not yet accepted for publication may be cited in the text as "unpublished observations". It is important for the authors to verify all references against the original documents.

Appendices (or Attachments)

Depending on the format for the main part of the proposal, some of the components described here separately may be included as appendices. Possible appendices are:

- Curriculum vitae.
- Facilities description.
- Letters of support.
- Illustrations.
- Anything that is not included in the body of the proposal but relevant to the reviewers.
  Some funding agencies do not allow appendices.

Situations often arise in which the type of proposal required may not necessarily be as detailed as the one described above. An example of such an instance is addressed in the next chapter.

Practice Questions

1. Describe the steps to be taken in writing a research proposal.
2. Outline the purposes of literature review in a research proposal.
3. What are the problems often encountered while undertaking a review of literature and how do you think they could be solved?
4. Explain the term "research design and methods".

5. Discuss the role of the following in a research
    proposal:
    *   Sustainability.
    *   Budget.
    *   Statement of problem.
    *   Timeline.

Letter of Proposal

Sometimes the scale of a research project might suggest a small-scale letter format proposal; on the other hand, your type of request might not require all of the proposal components or the components in the sequence recommended here. For example, a request to purchase a N90 000.00 computer for your departmental research simply does not lend itself to a lengthy narrative. A small contribution to your department's annual operating budget, particularly if it is a renewal of past support, might also warrant a letter rather than a full-scale proposal. The guidelines and policies of individual funders will be your ultimate guide. Many funding agencies today state that they prefer a brief letter of proposal; others require that you complete an application form. In any case, you will want to refer to the basic proposal components as provided here to be sure that you have not omitted an element that will support your case.

Elements of a Letter of Request

For the most part, they should follow the format of a full proposal, except with regard to length. The letter should be no more than three pages. You will need to

call upon your writing skills because it can be very hard to get all of the necessary details into a concise, well-articulated letter. As to the flow of information, follow these steps while keeping in mind that you are writing a letter to someone. It should not be as formal in style as a longer proposal would be. It may be necessary to change the sequence of the text to achieve the correct tone and the right flow of information.

Components of a Good Letter of Proposal

- **Ask for the gift:**
  - * The letter should begin with a reference to your prior contact with the funder, if any.
  - * State why you are writing and how much funding is required from the particular Foundation.
- **Describe the need:**
  - * In a very abbreviated manner, tell the funder why there is a need for this project, piece of equipment, etc.
- **Explain what you will do:**
  - * Just as you would in a fuller proposal, provide enough detail to pique the funder's interest.
  - * Describe precisely what will take place as a result of the grant.
- **Provide agency data**:
  - * Help the funder know a bit more about your organisation by including your mission statement, brief description of programmes offered, number of people served and staff volunteer.
- **Include appropriate budget data:**
  - * Even a letter of request may have a budget that is half a page long.

- *   Decide if this information should be incorporated into the letter or in a separate attachment.
- *   Whichever course you choose, be sure to indicate the total cost of the project.
- *   Discuss future funding only if the absence of this information will raise questions.
- **Close:**
  - *   As with the longer proposal, a letter of proposal needs a strong concluding   statement.
- **Attach any additional information required:**
  - *   The funder may need much of the same information to back up a small   request as much a large one.

It may take as much thought and data gathering to write a good letter of request as it does to prepare a full proposal (and sometimes even more). Don't assume that because it is only a letter, it isn't a time-consuming and challenging task. Every document you put in front of a funder says something about your institution. Each step you take with a funder should build a relationship for the future. A letter of proposal, letter of intent or pre-proposal are often the first step.

Letter of Intent to Apply:

- Can say very little.
- Indicates who you are, your institution, location and the programme you are applying for.
- Can be sent on letterheads/signature.
- Can be used to set up review panels.
- Is usually optional — if the deadline is missed, you may still be added to the list.

Differences between Letter of Proposal, Letter of Intent or Pre-proposal Letter

Pre-proposal
- Short concept paper (3-6 page description).
- Guidelines usually specify what to include.
- Written as a short proposal.
- Can be circulated among potential partners, heads of departments and deans, etc.
- Helps you clarify your thoughts.

Letter of proposal
- Written as a letter; addressed to a specific person.
- 1 to 4 pages but follow guidelines.
- usually requested by and written to a foundation.
- Funder can react to your idea.
- Make the best possible first impression — it may be the last.

Content is the same.
Paragraph 1 — who you are:
- Both individually and as an institution.
- Who you serve and where you are located.
- Why you are approaching the agency.
- Request for funds for project title.
- If you have contacted them before mention this.

Paragraph 2 — Why this agency?
- Specify relevant projects funded by the agency.
- Indicate why this project will appeal to them.
- Indicate how this project relates to/extends others they have funded.

Paragraph 3 — What is the need?
- What is the problem or need (short statement, one paragraph)?
- Include a few well-chosen statistics.
- How will you solve the problem/address the need with their money?

Paragraph 4 — What is the plan?
- Give a brief narrative (3 to 5 sentences) of your plan, your solution to the problem.
- List the project goals/objectives.
- Where will the project take place?
- Be confident — you can accomplish this task and do it really well.

Paragraph 5 — Why fund you?
- Why give the money to you — what makes you uniquely suited for this project?
- Institutional qualifications — resources, location, history, faculty, centres, experience, etc.
- Is this a model programme that can be replicated?

Paragraph 6 — How much?
- Indicate how much money you need.
- Note budget breakdown in huge categories (personnel, equipment).
- Identify other sources of funding if this agency can't provide it all.
- Include the time frame.
- Be accurate and realistic.

Paragraph 7 — Closing:
- Give contact information.

- Invite further conversation/state whether you will follow up with a phone call, e-mail, etc.
- Thank the reader for their time and attention.
- May need institutional signatures in addition to your own — institutional authority for the university to request and receive grant funds.

Attachments:
- Include attachments (if allowed):-
  * Data to support need.
  * Programme brochures.
  * Detailed timeline or budget.
  * Institutional information.

Before mailing:
- Reread, revise, polish.
- Have someone read it cold?
  * Are the ideas clear?
  * Are the methods clear?
  * Do you sound credible and capable?
- Have you used acronyms?
- Review the evaluation criteria, revise.
- Read once more for tone.

The main features of a proposal submitted to an academic institution, principally as part of the requirements for a higher degree, are outlined in the next chapter.

Practice Questions

1. Compare and contrast a research proposal and a letter of proposal.

Preparing a Thesis Research Proposal

A thesis research proposal is a proposal submitted to an academic institution for the acquisition of a higher degree. The principal aim of this type of proposal is to provide information about the intended research project in terms of content and methodology so that a Department/Institute/Faculty could assess:

- the feasibility of the project,
- the suitability of the candidate being registered for a research degree (Masters or doctorate), and
- the most suitable member of staff to serve as supervisor to the candidate.

The proposal should normally be developed in consultation with a member of staff, and should not exceed 5000 words. It is generally understood that the student may need to deviate from the proposed outline as the actual research degree unfolds. A typical format for a thesis research proposal is shown below.

The features of a thesis proposal bear similarities to those of the final dissertation/thesis (Olayinka *et. al.*, 2004) and a paper in a learned journal. *A good proposal should consist of the first three chapters of the*

dissertation/thesis. It should begin with a statement of the problem/background information (typically Chapter 1 of the dissertation/thesis), then move on to a review of the literature (Chapter 2) and conclude with a definition of the research methodology (Chapter 3). Obviously, it should be written in the future tense since it is a proposal. To turn a good proposal into the first three chapters of the dissertation/thesis consists of changing the tense from future tense to past tense (from "This is what I would like to do" to "This is what I did") and making any changes based on the way you actually carried out the research when compared to how you initially proposed to do it. Often the intentions we state in our proposal turn out differently in reality and we have to make appropriate editorial changes to move it from proposal to dissertation.

When should the Proposal be Written?

- A research proposal (particularly at postgraduate level) is an iterative process.
- A substantial amount of work has to be done before a proposal can be written.
- Some institutions assume that a research proposal will be written over six or even nine months.
- Seek advice on your draft from supervisors and peers.

Points to Note in Preparing your Thesis Proposal

Don't be too quick in running away from using a quantitative methodology because you fear the use of statistics. A qualitative approach to research can yield new and exciting understandings, but it should not be undertaken because of a fear of quantitative research. A well-designed quantitative research study can often

be accomplished in very clear and direct ways. A similar study of a qualitative nature usually requires considerably more time and a tremendous burden to create new paths for analysis where no path had existed previously.

Sometimes a combined methodology makes the most sense. You can combine a qualitative preliminary study with a quantitative main study to yield a research project that works well.

You may have the opportunity for conducting your research in conjunction with another agency or project that is working in related areas. Should you do it? Sometimes this works well, but most often the thesis researcher gives up valuable freedom to conduct the research project in conjunction with something else. Make sure the trade-offs are in your favour. It can be disastrous to have other projects suddenly start off and find your own research project temporarily delayed, or because you had tripled the size of your sample since the agency was willing to pay the cost of fieldwork. They paid for the fieldwork but they are now unwilling to pay for the analyses. What happens to your research? You have to think twice before altering your project to accommodate someone else. Enjoy the power and the freedom to make your own decisions (and mistakes) — this is the way we learn.

Format for Preparing a Research Proposal for an M.Sc./Ph.D. Thesis

The proposal would normally include the following components, depending on the nature of the project:

(a) Topic and problem:

The research topic formulates a problem that is worthy of research. The topic should:

- Be stated clearly and succinctly in one or two sentences.
- Be determined after consultation with potential supervisors.

The topic is usually framed as a "problem" or question in need of an answer. The topic statement will invite your reader to ask why it is significant and "worth doing". A good research proposal identifies in the research topic a "problem" to be investigated. Your statement of this will result from discussion of your area of interest with potential supervisors, mentors and others.

Framing the question is not always easy and you need to ask yourself whether your propped "problem" or "research question" is really the question to be asked and answered. The framing of the problem is crucial in setting up the research, though it is common for researchers to revise and reformulate this as the research progresses.

- What is the relevance of, and the rationale for choosing this area of enquiry.
- Why is the research question posed the way it is?
- Does the candidate have any particular motivation for posing this question or does he/she possess any expertise in this area?

(b)   **Background and context:**

Your research topic needs to be located in its context and background. In sketching this background, you need to show how and why the topic is important and why it is worth researching; this means:

- Contextualising the research problem — how does it arise?
- Outlining its significance — what will be the outcomes, and for whom?
- Referring to key issues that are associated with the topic.

Background can be provided in several ways. Your theoretical interests or concerns may have generated the research, and its justification is to be found in a theoretical development or related literature. Where professional practise is the focus, you may want to describe and analyse the context of policy or organisational changes.

In any case, you should summarise the influences which come into play to shape your research. The analysis should lead you to interrogate your own assumptions about why the problem is significant. You need to ask what interests are driving the research and from whose point of view the problem is "significant".

(c)   **Conceptual framework and related literature:**

A conceptual framework elaborates the research problem in relation to relevant literature. This should include a brief critical review of the literature relevant to the research question. What are the main texts and trends informing the thinking which has led to the

formation of this research question? It should deal with such matters as:

- Existing research and its relevance for your topic.
- Relevant theoretical perspective(s).
- Key ideas or constructs in your approach.
- Possible lines of inquiry you might pursue.

Your proposal needs to show how the proposed research relates to a body of related studies, or literature. The orthodox way to do this is to write a brief version of the literature review on a traditional science model. This is not always possible, especially if there is not much in terms of research material related to your topic. Another is to outline the kinds of theoretical sources that will inform your research — the available research perspective.

Though not all proposals need to include an elaborated conceptual framework, a well-developed proposal will do so.

(d) Research design and methodology:

- How are the main hypotheses going to be investigated or researched?
- An outline of the methodology, research design and procedure should be given.

This section might typically:

- Refer to an accepted method or approach.
- Highlight problems in developing a suitable approach (methodological issues).
- Describe how data will be generated, analysed and reported.

(e)   Pilot and ethical issues:

In proposals for empirical research, details will need to be provided of the proposed pilot work, the sequence of the various investigations and the research instruments which are intended to be used. In addition, the relevant methods of analysing the data will need to be discussed. Candidates whose researches involve human-subject research should bear in mind that approval by an ethics research committee will be required before any collection of data.

(f)   Research plan and timeline:

An outline of the approximate timetable of the various stages of the proposed research, from conception to completion, should be given. Your plan should specify what tasks you will complete at each stage — literature review, research framework, description of method, writing up of findings, conclusions and so on. These tasks should specify what writing tasks will be accomplished and when. It is helpful to:

- Illustrate the research as a semester by semester timeline.
- State semester writing objectives for each semester.
- State other outcomes at a given stage, such as seminar or conference papers.
- Allow a semester for revising the thesis.

You do not have an indefinite amount of time and other resources to complete the degree. Plan to complete within a minimum time period, and plan how you will achieve this.

Thesis preparation is a challenging writing task. It will be helpful for you to specify what writing outcomes there will be at each stage. Students are encouraged to understand their research in terms of scholarly writing, whether or not field research is involved. Early completion is more likely if the thesis develops through specific writing commitments including short papers which may be presented at seminars and conferences.

The following illustrates how a research degree thesis might be planned over six semesters.

Time	Research Stage	Writing/Report
Semester 1	• Proposal developed	• Proposal • Paper on the thesis argument • Thesis outline
Semester 2	• Reading of literature • Negotiate access field	Short papers on: • rationale and conceptual framework • review of literature
Semester 3	• Field research: development and pilot procedures • Database development	•Draft methodology chapter • Trial write-up of selected material • Re-work conceptual chapter
Semester 4	• Field research • Finalise procedures and complete	• Short papers on field research • Write up research procedures
Semester 5	• Analysis	• Draft analysis chapter • Prepare conference paper • Draft conclusions
Semester 6	• Revision of thesis	• Final chapter • Revise and refine thesis structure • Seminar on conference paper
Semester 7	• Submission and Examination	• Final revisions • Journal article

The research proposal which is submitted with an application is used primarily for making a decision about admission. It is not expected that this will be definitive or final. After commencing a research degree, it is normal for a research proposal to be modified as a result of further study and investigation, sometimes in substantial ways.

Evaluation of thesis research proposal

Those who will evaluate a thesis research proposal include the following:

- Higher degree committees.
- Review panels.
- Individual reviewers.
- Specialists.
- Generalists.
- A mixture of experts in the field and reviewers from cognate disciplines.

Evaluation Criteria

The essence of a successful research proposal is the idea underlying it. How can we evaluate whether our idea is a good idea, the definition of a good idea being one with the potential to be funded? Our scientific idea must be important, that is, it must address a significant, non-trivial problem. The idea must be conceptually sound and feasible, that is, capable of being investigated rigorously by the investigator using the resources available at his/her institution.

No.	Criteria	Expectation
1	Significance	Does the study address an important problem?
2	Approach	Are the designs and methods appropriate to address the aims?
3	Innovation	Does the project employ novel concepts, approaches, or methods?
4	Investigator	Is the investigator appropriately trained to carry out the study?
5	Environment	Will the scientific environment contribute to the probability of success?

Your major supervisor and co-supervisors are your allies. When you go to them for reactions to your proposal spend time with him/her before the meeting so that your plans are clear and you know you have their full support. The proposal meeting should be seen as an opportunity for you and your major supervisor to seek the advice of the committee. Don't ever go into the proposal meeting with the feeling that it is you against them.

Provide the committee members with a well-written proposal well in advance of the meeting. Make sure they have ample time to read the proposal.

Plan the proposal meeting well. Graphic presentations of maps and other illustrations are likely to be necessary to help the committee understand better; so make sure you prepare them so they look good. You can also scan some of the diagrams and prepare for a PowerPoint presentation using multimedia facilities. A well-planned meeting will help your committee understand that you are prepared to move forward with a well-planned research. Your presentation

style at the meeting should not belittle your committee members (make it sound like you know they have read your proposal) but you should not assume too much (go through each of the details assuming they have not gone through the whole proposal).

Research degrees in most universities and similar institutions are conducted by students under the guidance of advisers or supervisors. The expectations from such tutors are outlined in the next chapter.

Practice Questions

1. Write a short note on how to prepare a thesis proposal.
2. List those who are likely to be involved in the evaluation of a thesis research proposal.
3. What are the criteria for evaluating a thesis proposal?

Roles of a Supervisor in Developing Research Proposals

As part of earning a degree, a student will normally be expected to develop a research proposal. The reasons for this include:

- To develop competence and confidence in doing research.
- To guide trainees to develop research proposals.
- To put pressure on students to start their dissertation/thesis.

This invariably involves working under the supervision of a member of the academic staff in the department. Both parties have duties and responsibilities towards ensuring the attainment of the goals of the research.

On his/her part, the student will be expected to do the following:

- Take initiative and present to the supervisor.
- Respond to questions, challenges and requests.
- Explore alternatives for working effectively.
- To plan and execute the research project within the prescribed time period.

On the other hand, the tasks of a supervisor for the purpose of developing a research proposal include the following:

- To direct/guide/push.
- To refine/focus ideas.
- To challenge/correct.
- To encourage/value.
- To discuss/interact.
- To evaluate/judge.

The supervisor is typically the student's scholarly mentor. In fact in German universities, they are referred to as doctoral fathers. He/she is a member of the academic staff who works most closely with the candidate as he/she proceeds through all phases of the research. The supervisor usually has specific expertise in the field of the candidate's scholarship and offers guidance in the structure, content and methodology of the work. The supervisor also ensures that you are aware of current standards for the actual thesis/dissertation manuscript, its organisation and format.

The key to finishing your research is a good working relationship with your supervisor. Problems with your research can be frustrating, but problems with your supervisor can be fatal to your degree. On the other hand, a good relationship can be of long-tern mutual benefit to both of you. Don't expect your supervisor to structure the interaction, energise the relationship, or resolve supervision problems. Relating well is entirely up to you.

Most supervisors are interested in co-working with bright people on ground-breaking research — that

is why they became postgraduate teachers and professors. They are not particularly interested in working with students, or on student research projects. Moreover, few professors really enjoy thesis supervision.

Consequently, problems often arise in the course of thesis supervision. Kennedy (2004) has shown that eight out of ten postgraduate students working on their dissertation say they that they are stuck with "the advisor from hell". The other two think their advisor is "very nice, BUT...". Invariably, only very few research students claim that their advisor (or supervisor) is very helpful, cooperative and effective. Supervision problems can arise from the following sources:

- Postgraduate programmes do not adequately define the role of thesis supervisor.
- Supervisors are not motivated to help their candidates.
- Postgraduate students lack assertiveness in obtaining the services for which their supervisors are paid.

(a) Lack of standards for supervisor's role and performance

Institutions have different criteria for choosing, training and evaluating thesis supervisors. In most cases there is no standard at all, no special training and no mechanism in place for evaluating performance. This lack of professional role definition and oversight sets the stage for disaster.

Most institutions do not define reasonable expectations from supervisors. Other than a general

code of ethics and a quota on how many students supervisors can supervise, most don't set standards for supervising, and don't monitor the process. The few available guidelines are generalised role descriptions (e.g. meet with students as needed, read and return drafts in reasonable time, monitor students' progress, etc.). This allows supervisors considerable latitude in carrying out their supervising duties, of which they take full advantage.

(b) Lack of motivation for the supervisor

Sadly, on many occasions, a thesis supervisor often perceives this phase of his/her professional responsibility as a time-consuming distraction from teaching or their own research and writing. Having no specific training or guidelines for their role in nurturing the fledging thesis into existence, many supervisors find it easier to let their tutees struggle alone.

In academia, supervision gets little credit toward salary increases, promotions, or prestige, so few professors feel it is important. The result is, they lack motivation to supervise well, and are diffident about their supervising relationships. It is your supervisor's lack of involvement with the supervising role that places sole responsibility on you to set up and sustain a good supervising relationship.

(c) Lack of assertiveness by the research student

As a research student you are a consumer. You are paying your university for courses and for supervision, with the ultimate goal of receiving your higher degree. The university has a responsibility to provide you with

a supervisor who will guide you towards your goal. The supervisor is doing a job, and is being paid.

Setting expectations

To generate a good relationship, you need to hold reasonable expectations for your supervisor's role functions, as well as his or her attitudes and behaviours. Without understanding your supervisor's role, you won't know what to ask for. Without perspective on appropriate attitudes and behaviours, you won't know how to evaluate your supervisor's performance. Moreover, without balanced expectations, you're liable to be easily disappointed without cause, and you won't sense if your relationship with your supervisor starts to fail. As important as it is, achieving realistic expectations is difficult, mainly because there is a terrible lack of recognised supervising standards against which to gauge your interaction.

The imbalance of power

To sustain your relationship with your supervisor over the several years a thesis takes, you must perceive and resolve problems as they arise. Solving these problems is touchy. The power imbalance between you and your supervisor limits your course of action. Practically speaking, you need to start with a positive, businesslike attitude toward your supervisor and make changes and improvements, using suggestion and negotiation.

But you also need to keep your supervisor's role in perspective. Supervisors traditionally convey the notion:

- That they are all-powerful.
- That they are doing students a favour by advising them.
- That students have no option but to kowtow to their wishes.

Supervisors promote these ideas to retain their near-totalitarian control over the advising process, and students believe them.

In reality, supervisors do have final approval over the thesis or dissertation, but they are not all-powerful; they can be influenced, and they can be replaced. *Professors are not doing postgraduate students a favour by supervising them*. Even if supervisors are not adequately remunerated, they are employed to supervise students along with their other teaching, research and community service assignments. Students pay their institutions, and through them, their supervisors, for the advice they receive. Moreover, supervisors are more often than not likely to be co-authors with their former postgraduate students, of publications in learned journals which may be outputs from their research thesis work.

Unquestioning acceptance of the "suggestions" of a supervisor can scuttle your dissertation/thesis. You may have a better grasp of your topic than your supervisor does, and you will probably remember your study better from one meeting to the next. If you blindly follow your supervisor's directions, you might get hopelessly confused, or worse, you may begin to feel the thesis/dissertation isn't yours, and lose motivation to finish.

Students naturally focus on the supervising relationship more than their supervisors do, and the more successful students take control of it. Knowing the operating procedures for relating well with your supervisor helps you get the advice and support you need.

Types of Supervisors

Several kinds of supervisors can be identified. First, there are those who only advise inexperienced researchers from within their own departments and only for a single study. Second, there are those who provide assistance within their own discipline but over a longer period, and who are interested in the developing career of the inexperienced researcher. These supervisors are sometimes referred to as *mentors*. Finally, there are those who find themselves supervising a broad range of inexperienced researchers not necessarily from within their own discipline. This supervision may be provided formally or informally, one-on-one or in workshops and seminars. The knowledge and abilities required, the commitment of resources and the nature of the supervisory relationship will vary greatly between these three broad groups.

Expectations From a Supervisor

There is a certain amount of controversy about exactly what makes one research supervisor more successful than another. There is, however, a basic bundle of knowledge, ability and other resources about which there is general agreement. The exact proportions of the elements which make up this bundle will depend in part on whether you are supervising someone within

your discipline or supervising someone from another discipline.

It is important for research supervisors to develop a realistic understanding of their own strengths and weaknesses in the area of their students' research. Not all supervisors need to be experts in the subject areas or methodologies of the researchers they are supervising, but they do need to be aware of their limitations and should be able to point those they are supervising in the direction of appropriate support and resources. The supervisor doesn't have to provide all the necessary support, but he/she will need to be able to help the student find it. Supervisors should be aware of disciplinary approaches and methodologies, and when supervising students from outside their discipline, they should be wary of imposing conventions of their discipline in inappropriate ways.

All research supervisors should have:

- A broad knowledge of epistemology and the philosophy of science.
- Theoretical knowledge in the area of the research topic.

The research supervisor should have broad expertise in the area of the research topic so as to engage the inexperienced researcher in constructive debate, recommend reading from a position of knowledge, and engage critically with the inexperienced researcher's literature review, conceptual framework, and eventually his/her findings and conclusions. A formal supervisor will require in-depth knowledge of the area, while other types of supervisors need a general

sense of the area and know where to send the inexperienced researcher for additional support.

The research supervisor should have broad expertise in the common methodologies associated with the particular area of content. This enables the supervisor present the inexperienced researcher with a range of different possible methodologies, and to assist him/her in the complex job of selecting the most appropriate methodology for the particular study. While a supervisor should have strong methodological expertise in the relevant area, a co-supervisor or minor supervisor working with researchers from other disciplines needs a broad awareness of the options and should be able to assist the researcher to find suitable support from another source, if necessary.

Procedures and requirements vary somewhat between institutions, and even in some cases, within institutions. It is crucial that the research supervisor is fully aware of these procedures and requirements in order to ensure that the inexperienced researcher's proposal is acceptable for its particular purposes, whether for external funding or for registering for a higher degree.

Before deciding to take on a particular student, the prospective supervisor should reflect on:

- What knowledge is needed to provide support and advice for the project concerned.
- How his/her own knowledge measures up.
- Do you feel confident in your own knowledge of the relevant areas?

* If not, can you improve your own knowledge?
* Can you bring in outside expertise to assist you?
* Can you refer the inexperienced researcher to an expert in the relevant area?

Providing support and advice to inexperienced researchers is a challenging enterprise and supervisors should strive to improve their ability continually. In some cases it is appropriate for research supervisors to find ways of upgrading their skills and knowledge; in others, they should simply acknowledge gaps and refer the inexperienced researcher to an expert in those particular areas.

In general, the major supervisor is expected to:

- Show active interest in the student's research topic.
- Draw on his/her own research expertise to assist the student with his/her own research.
- *Treat the student as a peer.*
- Suggest possible links between the student's research and research in other areas.
- Provide constructive and timely feedback that helps to improve the standard of the student's research.
- Provide administrative advice that helps the student with his/her research.
- Provide assistance to enable the student further his/her research career.
- Provide extra support when the student needs it most.

The early stages of research at which the foundation for the study are laid are crucial. Where the necessary thinking and planning are exhaustively and

competently carried out, the research is likely to progress more smoothly, the researcher is likely to have a more positive and encouraging experience, and the final product is likely to be of a higher quality.

The major highlights of the techniques and skills required in preparing and writing a research proposal as described thus far are summarised in the last chapter of this book.

Practice Questions

1. What are the roles of supervisors in developing a research proposal?
2. Outline the problems commonly faced by thesis supervisors.

Chapter 9

Summary and Conclusions

Tips in Writing Research Proposals

The following tips will be found useful in writing proposals:

- Know the agency's organisational structure.

- Know the agency's programs.

  * Solicited versus unsolicited proposals.

- Review the summary of past awards.

- Proposals are meant to be convincing documents, not reports of scientific results; past or anticipated.

- Address who, what, where and why very early in the proposal.

- Be sure to mention why you should do the research, why it is important to the field in general and how it meshes with other research past, present and future.

- Place the proposed research in context and compare and contrast it with other research.

- Describe why your project is exciting and distinct from other projects.

- Make your points early and stay organised.

- Strive to stay focused —

  * Remember you are writing a proposal, not a scientific paper.

- Address the big picture —

  * Stress why your science is exciting.

- Layout of the proposal is important:

  * It should be easy to read and understand.

  * Write clearly and concisely.

  * Careful layout of Tables and Figures is critical.

  * Remember that *reviewers tend to correlate bad prose with bad science.*

- Spell and grammar check your proposal —

  * Remember that *reviewers tend to correlate bad spelling with bad science.*

- You will miss the obvious problems in your proposal because you are too close to them.

- Consequently, have your proposal reviewed by trusted colleagues before submission:

  * Heed their comments and advice.

  * Try using a colleague in another area of discipline.

- * If they do not understand why your work is exciting, neither will the review committee.

- * The harder reviewers have to work to understand your proposal, the more annoyed they get.

- Do not write the proposal for yourself; write it for the review committee.

- Be sure to write the proposal for the program you are applying for.

- Make your proposal memorable in some way.

  - * Balance length against brevity, multiple topics against single topic, and limit the number of proposals you submit.

  - * Selection committees are smart, they know when you have submitted multiple proposals.

- Abstracts of successful proposals in many funding agencies are online.

  - * Use these as a resource to find out what proposals are receiving funds and match your proposal to the style or subject of other proposals.

- Read and follow the instructions in the program announcement.

  - * Funding agencies take themselves and their words very seriously.

  - * The deadlines are firm; the required forms are really required, the signatures are really necessary.

- * Read the rules and save yourself a lot of irritation later.

- Give credit to others where appropriate.

- Do not omit important information (e.g. budget justifications, curriculum vitae, etc.).

- Good people (even outstanding scholars) can have their proposals rejected.

  - * take rejection as a learning experience.

Questions You Need to Ask Yourself

- Have I done a good job on the first page of explaining what I want to do and why it is important, in a way the typical reader can understand?

  - * This has to be both readable and interesting, and directed to the mission of the funding agency.

- Did I spend the right amount of space on the various aspects of what I am proposing (introduction, history, research plan, etc.?).

  - * Does it make sense as a narrative, and read well?

- Did I reference the right people (particularly likely reviewers)?

- Is my proposal understandable to the probable reviewers?

  - * Is it at the right technical level?

- Did I show why I am the right person to do this work (prior results, how this relates to my earlier work)?

- Did I include a plan to evaluate or assess my results? This is essential for some kinds of proposals.

- If there are issues this agency particularly looks at, have I addressed them?

- Does my proposal look professional (well formatted, nice diagrams, correct spelling and grammar)?

- Does my budget make sense in terms of being proportional to the amount of work I am proposing?

  * Did I ask for everything I could with reason without going overboard?

Common Mistakes in Proposal Writing

- Failure to provide the proper context to frame the research question.

- Failure to delimit the boundary conditions for your research.

- Failure to cite landmark, seminal studies.

- Failure to accurately present the theoretical and empirical contributions by other researchers.

- Failure to stay focused on the research question.

- Failure to develop a coherent and persuasive argument for the proposed research.

- Too much detail on minor issues, but not enough detail on major issues.

- Too much rambling — going "all over the map" without a clear sense of direction (the best proposals move forward with ease and grace like a seamless river).

- Too many citation lapses and incorrect references.

- Too long or too short.

- Failure to follow the recommended citation style.

- Sloppy writing.

If you are able to carefully consider all the features of a good proposal that have been outlined in this book and also avoid the common mistakes highlighted you stand a very good chance of producing a successful proposal. All that is probably left is to wish you good luck.

Practice Questions

1. What are the tips in writing a research proposal?
2. Assuming you have written a research proposal, what are the questions you need to ask yourself before submitting your draft proposal to a funding agency?
3. List the common mistakes in writing proposals.

References

Action Thesis Advisors (2004) Retrieved 3 September, 2004, from http::://csumb.edu/academic/ graduate/education/thesis/advisor.html

Adejobi, A.R. and Olayinka, A.I. (1997) "Stratigraphy and Hydrocarbon Potential of the Opuama Channel Complex, western Niger Delta." NAPE Bulletin, vol. 12, pp. 1-10.

Babbie, E. and Mouton, J. (1998) *The Practice of Social Research*. Cape Town: Oxford University Press, South Africa.

Bala, A. E. and Ike, E. C. (2001) "The Aquifer of the Crystalline Basement Rocks in Gusau area, northwestern Nigeria." *Journal of Mining and Geology*, vol. 37, pp. 77-184.

Bamiro, O. A., Oladepo, O., Olayinka, A. I., Popoola, L., and Soyibo, A. (2003) *The Planning and Writing of Grant-oriented Research Proposals*. Ibadan: Postgraduate School, University of Ibadan.

Boyce, P. B. (1993) *Hints on Preparing Research Proposals*. Retrieved 3 September, 2004, from http://www.aas.org/grants/hints.html

"Dissertation Advisor User's Manual", 2003. Retrieved 3 September, 2004, from http:// www.asgs.org/AdvManl.html

Edlund, J. (2003) *Teaching the Research Proposal: A Brief Process-oriented Overview*. Retrieved 3 September, 2004, from http:// www.csupomona.edu/~uwc/non_protect/ faculty/ResearchPro-art.htm

Friedland, A. and Folt, C. (2000) *Writing Successful Science Proposals*. Retrieved 6 September, 2004, from http://yalepress.yale.edu/ yupbooks/pdf.03000081405.pdf.

Helle, H. B., Bhatt, A. and Ursin, B. (2001) "Porosity and Permeability Prediction from Wireline Logs using Artificial Neural Networks: a North Sea Case Study." *Geophysical Prospecting*, vol. 49, pp. 431-444.

Kennedy, D. (2004) *Shouldn't my Advisor be Giving me Advice*? Retrieved 3 September, 2004, from http://www.dissertations.com/advisor.html

Koledoye, B. A. (2004) "Reservoir Characterization of the eastern Dahomey Basin, using Outcrop and Subsurface Data." M. Phil. research proposal, Dept. of Geology, University of Ibadan.

Kraicer, J. (1997) "The Art of Grantsmanship." Retrieved 21 April, 2005, from http:// www.hfsp.org/how/content.htm

Mouton, J. and Marais, H. C. (1996) *Basic Concepts in the Methodology of the Social Sciences*. Pretoria: HSRC Publishers.

Olayinka, A. I., Agbaje, A.A.B., Alonge, T. O., Ekpenyong, G.D., Gbadegesin, A. S., Isiugo-Abanihe, I. M., Oriaku, R., Raji-Oyelade, R., and Taiwo, V. O. (2004) *Guidelines to Writing a Doctoral Thesis*. Ibadan: Postgraduate School, University of Ibadan.

Olayinka, A. I. and Oyedele, A.A. (2001) "Geoelectrical Investigation of Sites along the proposed Ibadan-Ilorin Dual Carriageway." *Journal of Mining and Geology*, vol. 37, pp. 163-175.

Sanders, W. (2003) *Proposal Writing: The Business of Science*. Retrieved 22 April, 2003, from http://www.whitaker.org/sanders.html.

Stanley, D. (2001) *Writing from the Winner's Circle*. Retrieved 22 April, 2003, from http://epscor.unl.edu/newpages/noframes/pubs/winners/Chap1.html

Appendix 1

Definitions of Research on the Web

systematic investigation to establish facts
www.cogsci.princeton.edu/cgi-bin/webwn

a search for knowledge; "their pottery deserves more
research than it has received"
www.cogsci.princeton.edu/cgi-bin/webwn

inquire into
www.cogsci.princeton.edu/cgi-bin/webwn

attempt to find out in a systematic and scientific manner;
"The student researched the history of that word"
www.cogsci.princeton.edu/cgi-bin/webwn

Systematic investigation, including research
development, testing and evaluation, designed to
develop or contribute to generalisable knowledge. (45
CFR 46.102(d)) FDA regulations define research as
clinical investigation, which is any experiment that
involves a test article and one or more human subjects
and that either is subject to requirements for prior
submission to the FDA or which is intended to be
submitted later to the FDA as part of an application for
a research or marketing permit. (21 CFR 50.3(c))
www.aahrpp.org/definitions.htm

A systematic investigation, including research development, testing and evaluation, designed to develop or contribute to generalizable knowledge. Activities that meet this definition constitute research for purposes of this policy, whether or not they are conducted or supported under a program, which is, considered research for other purposes. For example, some demonstrations and service programs may include research activities.
www.clemson.edu/research/orcSite/orcIRB_DefsR.htm

a systematic investigation designed to develop or contribute to general knowledge. Activities which meet this definition, constitute "research," whether or not they are supported or funded under a program that is considered research for other purposes. For example, some "demonstration" and "service" programs may include research activities 45 CFR 46.102(d)
www.irb.purdue.edu/definiti.shtml

is systematic study directed toward more complete scientific knowledge or understanding of the subject studied. The federal government classifies research as either basic or applied according to the objective of the sponsoring agency.
www.aaas.org/spp/rd/define.htm

A systematic investigation, including research development, testing and evaluation, designed to develop or contribute to generalizable knowledge.
www.gulflink.osd.mil/medsearch/glossary/glossary_r.shtml

focused, systematic study and investigation undertaken to increase knowledge and understanding of a subject.

At SIUC, the term is used inclusively to refer to scholarly, empirical, creative, critical, and/or expressive activities in the sciences, humanities, arts, and other scholarly fields, which expand, clarify, reorganize, or develop knowledge or artistic perception. Includes Research training. Research may be basic or applied.
www.siu.edu/orda/general/glossary.html

Research is a systematic study directed toward fuller scientific knowledge or understanding of the subject studied. Research is classified as either basic or applied according to the objectives of the sponsoring agency. See also research, development, and R&D plant.
www.nsf.gov/sbe/srs/fedfunds/glossary/def.htm

All expenditures for activities specifically organized to produce research outcomes. This includes: Institutes and research centers, and individual and project research. (NACUBO)
www.bgtplan.lsu.edu/trend/glossary/gloss.htm

A systematic investigation (i.e., the gathering and analysis of information) designed to develop or contribute to general knowledge.
www.rush.edu/research/patients-definition.html

Interpreted in RSP 111, "Misconduct in Research," to include scholarship and creative work, as well as scientific research.
www.asu.edu/aad/manuals/rsp/rsp004.html

All expenditures for activities specifically organized to produce research outcomes. This includes: Institutes and research centers, and individual and project research.

www.selu.edu/Administration/Inst-Research/ Glossary.htm

This category should include all expenditures for activities specifically organized to produce research outcomes, whether commissioned by an agency external to the institution or separately budgeted by an organizational unit within the institution. Subject to these conditions, it includes expenditures for individual and/or project research as well as those of institutes and research centers. This category does not include all sponsored programs (training grants are an example) nor is it necessarily limited to sponsored research, since internally supported research programs, if separately budgeted, might be included in this category under the circumstances described above. Expenditures for departmental research that are separately budgeted specifically for research are included in this category.
www.boisestate.edu/research/ functional%20definitions.htm

A systematic investigation, including research development, testing and evaluation, designed to develop or contribute to generalized knowledge. Topic areas: Fundraising and Financial Sustainability.
www.nonprofitbasics.org/TopicAreaGlossary.aspx

Funds to cover the costs of investigations and clinical trials, including demonstration and pilot projects. (Research grants for individuals are usually referred to as Fellowships.)
gtionline.fdncenter.org/gti_help/1glosary.htm

means systematic investigation designed to develop or contribute to generalizable knowledge. Under this definition some demonstration, service and training projects may be considered to include research activities. www.iup.edu/graduate/irb/defnabbr.shtm

A systematic investigation, including research development, testing and evaluation, designed to develop or contribute to generalized knowledge. www.nwhealth.edu/research/irb/irbgoals.html

The collecting of information about a particular subject. nces.ed.gov/NCESkids/Glossary.asp

A form of inquiry that involves seeking of evidence to increase knowledge. A systematic process for recognizing a need for information, acquiring and validating that information, and deriving conclusions from it. www.seattlecentral.org/library/101/textbook/ glossary.html

investigation and experimentation aimed at discovery, interpretations, and application of scientific data. pharmacy.ucsf.edu/glossary/

research and development (R&D) which involves more than one technical discipline or program area in order to be fully successful; also multi- or inter-disciplinary R&D. energytrends.pnl.gov/glosn_z.htm

a systematic study directed toward more complete scientific knowledge or understanding of the subject studied. The federal government classifies research as

either basic or applied according to the objective of the sponsoring agency.
www.esb.utexas.edu/surge/Resources&Links/
glossary.htm

Many varieties and categories of research are relevant to dietary supplements. See clinical trial, control group, double-blind study, in-vitro research, peer review, placebo, randomized controlled trial, single-blind study, treatment group.
www.supplementquality.com/glossary.html

When an activity involving a patient is undertaken with the prime purpose of testing a hypothesis and permitting conclusions to be drawn with the intention of contributing to medical knowledge, it becomes research.
www.mrc.ac.za/ethics/definitions.htm

Appendix 2

The Nigerian Association of Petroleum Explorationists — University Assistance Programme Grants-in-Aid 2004

Application Form

The Nigerian Association of Petroleum Explorationists — University Assistance Programme announces its Grants-in-Aid Programme for 2004. The budget for this year is approximately N2,250,000. The programme includes special grants named in recognition of benevolent leaders/corporate organisations. These individuals/organisations have made substantial contributions to the UAP, teaching, and research programme in Nigerian universities and polytechnics.

Purpose

The purpose of the programme is to foster research in the geosciences by providing support to undergraduate and graduate students in the earth sciences whose research has application to the search for and development of oil, gas, energy-mineral resources, hydrogeology and related environmental geology issues.

Who is Eligible and Grant Value

Award recipients must be enrolled in a HND, Bachelor, Masters or Ph.D. programme. They must be of proven character who maintain the ethics and standard of the profession while above all must have a constant high grade in his chosen academic career i.e. minimum of 2.50 CGPA and 60% aggregate for B.Sc. and M.Sc. respectively. However, credit will be given for higher grades. Monetary awards range from a minimum amount of N35,000 to a maximum of N200,000 for postgraduates and N15,000 to N35,000 for undergraduates.

Use of Grants

Grants are to be applied to expenses directly related to the student's thesis work, such as fieldwork, laboratory analyses and books, as detailed on page 3. The educational institution attended by the applicant must ensure the grants appropriate use of the, are not turned over to the institution.

Basis for Awarding Grants

Grants would be based on merit, proven character and, in part, on the financial needs of the applicant. Applicants will be selected based on: qualification of the applicants as indicated by past academic performance, originality and imagination of the proposed project, support by the department in which the work is being done and significance of the project to petroleum, energy-minerals and related environmental geology. This programme is in line with other associations such as AAPG, SPE and other education assistance programmes.

For prudence, these grants will only be awarded once to any one applicant doing an M.Sc. degree and twice for applicant doing B.Sc. and Ph.D. Programmes. Further grants to the same applicants will be based on excellent academic performance.

Intent, Recommended Guidelines and Disbursement

The overall intent of this programme is to assist students by subsidising selected projects. The following guideline is recommended for most projects.

a. 30% of the amount should be used to cover fieldwork expenses, including:
(i) Transportation, accommodation and feeding for student and the supervisor.
(ii) Fieldwork and sampling equipment and materials.

b. 60% of the amount should be spent on laboratory analyses including:
(i) Sample preparation.
(ii) Photographic materials and production.
(iii) Chemicals and laboratory wares.
(iv) Cost of analyses within or/and outside the university.

c. 10% of the amount should be spent on report/ thesis production.

Disbursement may vary with project and value of grant. For most projects, 100% of the grant will be paid in advance while in certain cases it will be based on a formula determined by the committee in consultation with the relevant institutions.

Table of benevolent Group/Individual NAPE Grant-in-Aid

Dr Emmanuel Enu — Obafemi Awolowo University (postgraduate). mentorship).

Dr. Abayomi Fisher — University of Ibadan (postgraduate). (postgraduate).

Mr Dan Ogbe — University of Benin (undergraduate).

Femi Akinmade — University of Ibadan (postgraduate).

Mr Adekunle Adesida, —Federal University of Technology, Akure (postgraduate and publication). (undergraduate).

Mr Nosa Omorodion, — Federal University of Technology, Akure (journal publications). Mr Godwin Ochogbu, — Obafemi Awolowo University, Ife (postgraduate). Dr Joe Ejedawe, — University of Benin (postgraduate). Veritas-DGC Nigeria Limited in partnership with Ashbert Nigeria Ltd. — postgraduate [5] (nationwide). Ms Iyabo Sindiku — University of Ilorin (equipment maintenance, etc.).

Mr Ebi Pinnick — University of Ibadan [1] and Fed. Univ. of Tech., Owerri [2] (undergraduate). Mr Chike Onyejekwe — University of Nigeria, Nsukka (postgraduate).

Mrs Jacqueline Goyea — University of Ilorin (undergraduate).

Dr Layiwola Fatona — Olabisi Onabanjo University, Ago-Iwoye (undergraduate

Mr S. L. Fadayomi University of Ibadan

Chief Tunde Afolabi, — University of Ibadan (postgraduate). — ATBU, Bauchi (postgraduate). — University of Port Harcourt (postgraduate). Chief

Dr Ebi Omatsola — University of Ibadan (Postgraduate [3]). Mr Kunle Odusina — Obafemi Awolowo University, Ile-Ife (postgraduate). — UNN, Uniben & OOU, Ago-Iwoye

Mr Promise Egele — University of Port Harcourt (postgraduate and undergraduate).

Mr Mayowa Afe — University of Ado-Ekiti (postgraduate). Mr Sunkanmi Iyiola — The Polytechnic Ibadan (HND Geology) FUTA, Akure & University of Lagos (undergraduate). .

Mr Emmanuel Adokpaye — University of Jos (postgraduate).

Mr Gilbert Odior — University of Benin (postgraduate).

Mr Dapo Adeyemo — University of Ibadan (postgraduate [4]).

Mr Isaac Arowolo — Obafemi Awolowo University, Ile-Ife (undergraduate [2] and postgraduate [2])

Retrieved 17 August, 2004, from http://www.nape-nigeria.org/uap%grants.htm.

How to Apply:

1.   Complete this <u>application</u> in full. Please type or
     print neatly, since legibility affects your evaluation
     (you may also photocopy).

Please note that only one application is required per
student.

2.   Attach an official copy of your college academic
     transcripts from the last two (2) years. (If your
     school does not issue transcripts, attach a signed,
     department stamped statement from your professor
     or Head of Department identifying you as a
     currently enrolled student of the school as well as
     commenting on your academic credentials).

NOTE: You will be eligible for consideration of a grant
only if all of the requested information accompanies
your application.

3. Mail your application and supporting documents to:

The Executive Director,
Nigerian Association of Petroleum Explorationists
(NAPE)
UAP Grants-in-Aid,
NAPE Secretariat,
Plot 47A, Femi Okunnu Estate,
Lekki, Victoria Island,
P. O. Box 12598, Lagos.

5. Deadlines: Only applications received on or before
   30 September, 2004, will be considered.

6. Award Notification: At 2004 NAPE Conference.

The application form can be downloaded from the Association's Website. The required information include:
1. Personal Information
2. Academic Records
3. Research Project Proposal
   (a) Title and aim of proposed investigation or thesis:
   (b) **Disciplinary Emphasis:** (Underline 1 or 2 disciplines that most closely relate to your project).
        Stratigraphy, Petroleum, Regional, Tectonics, Geochemistry, Petrophysics   Energy/ Minerals, Sedimentology, Paleontology, Structural   Geology,   Geophysics Development Geology, Environmental Geology.
   (c) **Source of Research Project** (individual, student's idea, part of professor's ongoing research, outgrowth of class work/ professional work, critical review of literature, etc.).
   (d) **Nominated Grants** – List any of the nominated grants and or corporate grant for which your project is most suited:
   (e) Percentage of project completed (between 0-100%).
   (f) **Summary of Investigation** (approximately 300 words; no figures or photos) – Must be printed or typed or pasted to fit within this space. This should include the objective, regional context, methods and scientific importance of your proposal.
   (g) **Suitability of proposal to Grants-in-Aid Programme** – Describe how the programme

will contribute to the better understanding of petroleum geology, energy minerals geology, and/or related environmental issues. *The suitability is critical to your thesis topic evaluation.*

4. Previous NAPE-UAP Grants-in-Aid.
5. Endorsement/assessment by thesis/project supervisor.
6. Endorsement by Head of Department.

Appendix 3

THE AAPG Grants-in-Aid 2004

In 2004 the American Association of Petroleum Geologists Foundation awarded $130,200 to 75 of out of 280 applicants through its Grants-in-Aid Program. The Program includes special grants named in recognition of the following individuals and institutions that have made substantial contributions to the Foundation, petroleum and energy-mineral sciences, teaching, or research.

- **Gustavus E. Archie Memorial Grants** (2)

    *   http://foundation.aapg.org/gia/archie_mem.cfm

    *   Petrophysics and development geology.

- **Gustavus E. Archie Memorial International Grants** (2)

Study of petrophysics and development geology by students outside North America.

- **Gordon I. Atwater Memorial Grant**

    *   Awarded annually to a deserving graduate student through the American Association of Petroleum Geologists Grants-in-Aid Program, and is endowed through a

generous bequest from Dr Atwater to the AAPG Foundation.

* http://foundation.aapg.org/gia/ atwater.cfm

• <u>**Marilyn Atwater Memorial Grant**</u>

* Awarded annually to a deserving graduate student through the American Association of Petroleum Geologists Grants-in-Aid Program, and is endowed through a generous bequest from her father, Gordon I. Atwater, to the AAPG Foundation.

* http://foundation.aapg.org/gia/ atwater_m.cfm

• **Richard W. Beardsley-named Grant**

Student studying petroleum geology in the Eastern Section of the AAPG region.

• <u>**Don R. Boyd Memorial Grant**</u>

A student within the boundaries of the Gulf Coast Section of AAPG

* This grant is given annually to a deserving graduate student who is studying in a school within the boundaries of GCAGS (the Gulf Coast Section of AAPG). Funding comes from an American Association of Petroleum Geologists Foundation endowment established with numerous contributions from friends and colleagues.

    *   http://foundation.aapg.org/gia/
    boyd.cfm

- **Garth W. Caylor Memorial Grant**

    *   Awarded annually to a deserving
    graduate student through the American
    Association of Petroleum Geologists Grants-
    in-Aid Program. Funding for the grant
    endowment came from a bequest that Mr
    Caylor left to the American Association of
    Petroleum Geologists Foundation.

    *   http://foundation.aapg.org/gia/
    caylor.cfm

- **Classen Family-named Grant**

    *   Awarded annually to a qualified graduate
    student through the American Association
    of Petroleum Geologists Grants-in-Aid
    Program. Funding for the endowment comes
    from generous gifts to the AAPG Foundation
    from James Classen and Willard C l a s s e n,
    Jr., in memory of their father, Willard Classen,
    Sr.

    *   http://foundation.aapg.org/gia/
    classen.cfm

- **Kenneth H. Crandall Memorial Grant** (2)

    *   Awarded annually to two deserving
    graduate students through the American
    Association of Petroleum Geologists Grants-
    in-Aid Program and is endowed by the AAPG
    Foundation through generous contributions

from the Chevron Emeritus Exploration Managers Group, from his two sons, Ken Jr. and William Crandall and from Chevron Corporation.

* http://foundation.aapg.org/gia/ crandall.cfm

- **Fred A. Dix-named Grant**

 * Awarded annually to a deserving graduate student through the American Association of Petroleum Geologists Grants-in-Aid Program, and is endowed by the AAPG Foundation with a generous contribution from E. F. Reid, and many of his other friends and associates.

 * http://foundation.aapg.org/gia/dix.cfm

- **Energy Minerals-named Grant**

 Research in Geology related to the occurrence and production of earth materials, except conventional oil and gas, capable of being used in energy production, and including remote sensing.

 * Awarded annually to a deserving graduate student whose research in Geology is related to the occurrence and production of earth materials except conventional oil and gas capable of being used in energy production, including remote sensing. The grant is awarded through the American Association of Petroleum Geologists Grants-in-Aid Program and is funded by generous endowment contributions to the AAPG Foundation from Donald and Marjorie Towse.

* http://foundation.aapg.org/ em_grant.cfm

Norman H. Foster Memorial Grant

*   Awarded annually to a qualified graduate student through the American Association of Petroleum Geologists Grants-in-Aid Program, and is endowed through the AAPG Foundation from generous contributions by his numerous friends and colleagues

* http://foundation.aapg.org/gia/ foster.cfm

• Harold J. Funkhouser Memorial Grant

*   Awarded annually to a deserving graduate student through the American Association of Petroleum Geologists Grants-in-Aid Program, and is endowed through generous contributions to the AAPG Foundation from his brother, Lawrence W. Funkhouser, and numerous other colleagues.

* http://foundation.aapg.org/gia/ funkhouser.cfm

• Jean G. Funkhouser Memorial Grant

*   Awarded annually to a deserving geoscience graduate student through the American Association of Petroleum Geologists Grants-in-Aid Program, and is endowed through generous contributions from her many friends and associates.

*   http://foundation.aapg.org/gia/funkhouser_jean.cfm

- **Peter W. Gester Memorial Grant**

  *   Awarded annually to a deserving graduate student through the American Association of Petroleum Geologists Grants-in-Aid Program, and is endowed by the AAPG Foundation with generous contributions from his family and friends.

  *   http://foundation.aapg.org/gia/gester.cfm

- **Robert K. Goldhammer Memorial Grant**

Study of carbonates.

- **Merrill W. Haas Memorial Grant**

  *   Awarded annually to a qualified graduate student through the American Association of Petroleum Geologists Grants-in-Aid Program, and is endowed through the AAPG Foundation from generous contributions by his numerous friends and colleagues.

  *   http://foundation.aapg.org/gia/haas.cfm

- **Michel T. Halbouty-named Grant** (2)

Students at Texas A&M University —

  *   Awarded annually to students at Texas A & M University, through the American Association of Petroleum Geologists Grants-

in-Aid Program. It is endowed by the   AAPG
Foundation through a generous contribution
by Michel T. Halbouty.

*   http://foundation.aapg.org/gia/
halbouty.cfm

- **William Dow Hamm Memorial Grant**

Student at University of Texas, Austin.

*   Awarded   through   the   American
Association of Petroleum Geologists Grants-
in-Aid Program and is endowed by the
AAPG Foundation through generous
contributions from W. Dow Hamm Jr. and
Richard B. Hamm. The William Dow Hamm
Memorial Grant is awarded annually to a
deserving graduate student from the
University of Texas at Austin.

*   http://foundation.aapg.org/gia/
hamm.cfm

- **Bernold M. "Bruno" Hanson Memorial
  Environmental Grant**

Study of specific environmental issues related to
exploration and production of petroleum and energy
minerals, or application of technologies developed/
employed in petroleum or energy minerals industries
to environmental problems.

*   http://foundation.aapg.org/gia/
hanson.cfm

- **Richard C. Hasson Memorial Grant**

Student studying in the U.S.

- **Thomas A. Hendricks Memorial Grant**

Study of the Ouachitas, the Arkoma Basin and/or the Marathon/Solitario areas, or for study involving petrography or petrology.

- **James E. Hooks Memorial Grant**

Student at Florida State University or Texas A&M.

- **The Institut Français du Pètrole-named Grant**

     * http://foundation.aapg.org/gia/instfranc.cfm

- **John E. Kilkenny Memorial Grant**

Geologic study of Alaska, California, Hawaii, Oregon or Washington, by student at a university in that area, i.e., Pacific Section AAPG.

     * http://foundation.aapg.org/gia/kilkenny.cfm

- **Frank E. Kottlowski Memorial Grant**

     * http://foundation.aapg.org/gia/kottlowski.cfm

- **R. E. McAdams Memorial Grant** (2)

     * http://foundation.aapg.org/gia/

- **Duncan A. McNaughton Memorial Grant**

     * http://foundation.aapg.org/gia/

- **Arthur A. Meyerhoff Memorial Grant** (2)

Geological studies applicable to regional or global tectonics.

  * http://foundation.aapg.org/gia/

- **James W. Milliken Memorial Grant**

Student at Texas A&M University.

  * http://foundation.aapg.org/gia/milliken.cfm

- **Hugh D. Miser Memorial Grant**

Study of geology of Arkansas and/or Oklahoma.

  * http://foundation.aapg.org/gia/

- **Raymond C. Moore Memorial Grant**

- Paleontology.

  * http://foundation.aapg.org/gia/moore.cfm

- **Nancy Setzer Murray Memorial Grant**

Significant involvement with stratigraphy.

  * http://foundation.aapg.org/gia/murray.cfm

- **Paul Danheim Nelson-named Grant**

  Study of impact geology, geology of environment, resource development, management and conservation; including hydrocarbons, or geology

of landscapes and formation [buried streams & valleys], or linear pattern geology.

> * http://foundation.aapg.org/gia/ nelson.cfm

- **Donald A. O'Nesky-named Grant**

> * http://foundation.aapg.org/gia/ onesky.cfm

- **R. Dana Russell Memorial Grant**

Sedimentary petrology/petrography or oceanography.

> * http://foundation.aapg.org/gia/ russel.cfm

- **SEAPEX-named Grant**

Student whose nationality is from Southeast Asia: Bangladesh, Myanmar, Thailand, Laos, Vietnam, Cambodia, Malaysia, Singapore, Indonesia, Philippines, Brunei, Papua New Guinea, Timor or China.

> * http://foundation.aapg.org/gia/ seapex.cfm

- **Frederick A. Sutton Memorial Grant**

- **Suzanne Takken Memorial Grant**

- **John Teagle Memorial Grant**

- **J. Elmer Thomas Past-Presidents Grant**

- **Horst and Jessie von Bandat Memorial Grant**(2)

- **Alexander and Geraldine Wanek-named Grant**(2)

- **L. Austin Weeks-named Grant**

- **Marta S. Weeks-named Grant**

- **Sherman A. Wengerd Memorial Grant**

- **Weimer Family-named Grant**

Student at University of Wyoming.

- **W. David Wiman Memorial Grant**

- **Raymond D. Woods Memorial Grant**

The Alexander and Geraldine Wanek-named Grant is awarded annually to two deserving graduate students through the American Association of Petroleum Geologists Grants-in-Aid Program, and is endowed through a generous bequest from Alexander Wanek to the AAPG Foundation.

The L. Austin Weeks-named Grant is awarded annually to a deserving graduate student through the American Association of Petroleum Geologists Grants-in-Aid Program, and is endowed by the AAPG Foundation with generous contributions from the Weeks family.

The Marta Sutton Weeks-named Grant is awarded annually to a deserving graduate student through the American Association of Petroleum Geologists Grant-in-Aid Program, and is endowed by the AAPG Foundation with generous contributions from the Weeks family.

The American Association of Petroleum Geologists Foundation Grants-in-Aid

(Retrieved 3 September, 2004, from http://foundation.aapg.org/gia/about.cfm)

The purpose of the AAPG Foundation's Grants-in-Aid Program is to foster research in the geosciences. Grants are made to provide financial assistance to graduate students (currently enrolled in Masters or Ph.D. programs) whose thesis research has application to the search for and development of petroleum and energy-mineral resources, and/or to related environmental geology issues.

Grants are based on merit, and in part, on the financial needs of the applicant. Although the focus of the Program is the support of qualified candidates for Masters or equivalent degrees, qualified doctoral candidates are also encouraged to apply. Factors weighed in selecting successful applicants include: the qualifications of an applicant as indicated by past performance; originality and imagination of the proposed project; support of the department in which the work is being done and perceived significance of the project to petroleum, energy minerals and related environmental geology.

Grants range from $500 to $2,000 and are to be applied to expenses directly related to the student's thesis work such as field work, laboratory analyses, etc. Funds are NOT to be used for capital equipment, conferences, salaries, tuition or room and board during

the school year. Further details will be included at the online submission site.

If you do not have browsing access to the Internet, contact us by e-mail at rgriffin@aapg.org, or write to:

Rebecca Griffin, Grants-in-Aid Coordinator
AAPG Foundation
P.O. Box 979
Tulsa, OK 74101-0979 USA.

The American Association of Petroleum Geologists Foundation

Grants-in-Aid Application Instructions
(Retrieved 3 September, 2004, from http://
foundation.aapg.org/gia/howto.cfm)
Online applications are now being accepted; however,
taking time to review these instructions will help you
with the online application process. Should you wish
to skip these instructions and proceed to the online
submission process you may do so.

1   Applicant name and contact information

2   Academic and employment history

3   Project summary

4   Description of research project (limited to 300
     words)

5   Project budget and funding request. You will
     download and save an Excel spreadsheet and then
     upload into your application. It is extremely
     important that you provide the budget for your
     entire project. If your total research budget is
     $20,000 and you request $2,000 from the AAPG
     Foundation, please indicate which other agencies
     you have applied to for the additional funding of
     $18,000.

6   Previous AAPG Foundation grants (if any).

7   The name and email address for two separate
     references qualified to endorse you and your

project. (Preferably your thesis/project supervisor and the Department Chairman or Director — not the same person).

8   Submit official academic transcripts from the last two years (or equivalent). This transcript must be mailed to:
AAPG Foundation
c/o GIA Coordinator
P.O. Box 979
Tulsa, OK 74101-0979, USA.

The transcript cannot be submitted online. Xerographic copies, facsimile copies and computer generated transcripts are unacceptable.

9   Once this information is submitted your two referees will receive an e-mail message. They must respond to that message by submitting their endorsements online.

10   Deadline: Applications must be completed online by January 31, 2005.

11   Award Notification: Awards will be announced in May, 2005. Bookmark the **AAPG Foundation Grants-in-Aid home page** and begin checking it at that time.

12   International Applicants: Grants to successful applicants are made in U.S. dollars, usually by a cheque drawn on a U.S. bank. However in some countries, delivery of grants can only be assured by bank wire transfer. Students selected to receive grants will be contacted by the AAPG Foundation

concerning delivery of their grants. They must
confirm that they can safely accept mail delivery of
the grant payable by U.S. cheque, or they must
provide all the banking information necessary for
wire transfer of the grant, including the
appropriate bank account **in the name of the
student recipient**. **A grant will not be sent to a
third party or wire transferred to a third party's
account.**

Students who are unable to accept funds by one of these
methods will be ineligible, and should not apply.

Retrieved 16 October, 2004, from http://
foundation.aapg.org/programs.cfm
AAPG Undegraduate Grants
Nominated recipients' names must be received at AAPG
headquarters by *December 1, 2004*
Undergraduate earth science majors need not be
members of Student Chapters or AAPG to be eligible.

- To obtain a form contact
Student Affairs Coordinator
Phone (US & Canada):
1-888-945-2274 ext. 653
Phone (all others):
1-918-560-2653

The American Association of Petroleum Geologists and
the AAPG Foundation announce the L. Austin Weeks
Undergraduate Grant Program for the 2004-05 school
year. Funding is provided through a generous
endowment gift from L. Austin Weeks to the AAPG
Foundation.

Aims

The purpose of the grant is to support educational expenses of undergraduate geoscience students and their departments.

Grants Size and Usage

The disbursement of the grant for the current school year will consist of a maximum amount of $1,000 per qualified student chapter. Half of the calculated grant will be given to a qualified undergraduate student. The remaining is for the geoscience department, and should be used to support educational activities of the student chapter, i.e. for equipment, conferences, fieldtrips, etc.

Requirements

Applications will be accepted for the L. Austin Weeks Undergraduate Grant from chapters who meet the following requirements, additional details of these requirements can be found in the AAPG Student Chapter Bylaws and Operations Manual.

Regulations for student grant:

A local committee consisting of not less than 3 individuals should determine the student recipient to be nominated. Recommended committee participants are:

1. The faculty advisor to the student chapter.

2. The sponsoring society liaison.

3. The student chapter president (if not a candidate).

4. The department chairman.

5. One or more graduate teaching assistants.

The chapter **must** —

- Be in establishment for exactly one year from the date of deadline submission to qualify for grant (an official chapter since 15 December, 2003).

- Have at least 9 members who are AAPG student members, with member numbers*

- Have at least one faculty sponsor who maintains active or Associate member status in AAPG*.

- Have an executive committee for the chapter (President, Vice-President, Secretary and Treasurer).

- Hold at least one meeting per month throughout the school year.

- Have filed at least two reports with AAPG Headquarters, one in December, and one at the end of the school year.

* Dues must be paid for the 2004-05 fiscal year.

Award Notification & Regulations

Chapter and student recipients will be announced in January, 2005. The grants to successful students and chapters are issued in U.S. dollars and the grant is paid separately between the chapter and the student,

usually by a cheque drawn on a U.S. bank. However in some countries, delivery of grants can only be assured by bank wire transfer. Students selected to receive grants will be contacted by the AAPG Foundation concerning delivery of their grants. They must confirm that they can safely accept mail delivery of the grant payable by U.S. cheque, or they must provide all the banking information necessary for wire transfer of the grant, including the appropriate bank account number in the name of the student recipient or AAPG Student Chapter. A grant cannot be sent to a third party or wire transferred to a third party's account. Students who are unable to accept grants by one of these methods will be ineligible, and should not apply.

If incorrect information has been provided during submission for the grant, i.e. cheque, wire transfer or postal mailing address, a deadline date for the appeal on correction is 1 May, 2005.

L. Austin Weeks Biography

Mr Weeks was born on the island of Curacao on 25 March, 1925, the only child of Lewis G. and Una Austin Weeks. When he was two weeks old his family went to Venezuela to live, moving later to Argentina and Brazil.

In 1933 he was sent to the Beacon Preparatory School in Sussex, England, where he lived until 1939, before moving on to Scarsdale High School in 1942.

He graduated from Brown University in an accelerated program that put him through college in two years and eight months with a pre-med degree and an ensign's commission in the U.S. Naval Reserves. He then spent

three months at the Navy Communications School at Harvard University.

During the war his overseas duty took him first to the Mediterranean Theater, allowed later by involvement in the occupation of Japan, serving on Gen. Douglas MacArthur's Army-Navy communications staff in Tokyo (1945-46).

He did some postgraduate study at Brown University, then went to the University of Wisconsin where he earned an M.Sc. in Industrial Bacteriology (1947- 49). During summers, he worked for Sinclair Wyoming Oil Co. in Casper as a geological assistant and researcher on magnetic properties of granites and arkoses.

In 1950, he received his M.A. in Geology from Columbia University, his thesis being in the area of structural geology.

From 1950-52, he lived in Salt Lake City, working as a field geologist for General Petroleum Corporation. He married Marta Sutton in August, 1951, and they moved to Durango, Colombia, where Austin was a field geologist for General Petroleum. He became a district geologist in 1953 and until 1957, did field and research work in Utah, Wyoming, Idaho, Colorado, Arizona, New Mexico and Nevada.

Transferred to California in 1957, he did geological research at General Petroleum headquarters until 1960, when the Company was reorganised and he, along with many others, was laid off.

Austin spent several years in real estate sales and investments, then worked as a biologist for Columbia University, studying plankton in the Antarctic in 1963. He then joined the Department of Commerce in Washington, D.C. as a geological oceanographer, serving in 1964 as chief scientist for the expedition to the Andaman Islands for the International Indian Ocean Expedition.

He consulted for the Israeli government with his father, L.G. Weeks, in 1963, and also was involved as chief scientist on trips to the Lesser Antilles in the Caribbean, and to Alaska.

In 1970-75, he started and was President of Weeks-Tator Consultants in Miami, Florida, and in 1970-84 was involved as a Vice-President and Director of Weeks Petroleum Ltd., a Bermuda corporation. When this Company was traded on the London stock exchange in 1984, he retired.

Since that time he has been involved in volunteer photography in the Miami area, producing an annual calendar. He also has been involved in funding support for the University of Miami, the University of Wyoming, AAPG, the Miami Metrozoo and SPE.

Appendix 4

The SEG Foundation Scholarship Program

Society of Exploration Geophysicists, Tulsa, Oklahoma

http://seg.org/business/foundation/scholarships/

SEG Foundation Scholarship Program

In 1959, the Society of Exploration Geophysicists began a program of encouraging the establishment of scholarship funds by companies and individuals engaged or interested in the field of geophysics. SEG saw the need for a more appropriate organisation and caused the SEG Foundation to be organised.

The number of scholarships available depends chiefly upon the number of sponsors and the amounts they contribute. For the 2004-2005 academic year, the Foundation awarded 124 scholarships totaling $223,250. This represented 60 renewals of scholarships to students on a continuing basis and 64 scholarships to new recipients receiving grants for the first time. In addition to general scholarships, other scholarships are available to students who meet specific criteria.

The amount of contributions range from a few dollars by individuals, to as high as several thousand dollars by sponsors of full scholarships. The awards to recipients range from $500 to $14,000 per academic year, with average awards being approximately $1,500 per academic year. An effort is underway to increase the average amount of individual awards to $2,000 per academic year. The term of each scholarship is one academic year; however, some scholarships may be renewed based upon certain criteria.

Any recognised college or university which offers courses of study in geophysics or a closely related field may be chosen by the recipients subject to requirements for admission and any restrictions specified by the sponsor.

Applications and supporting documents must be received by 1 March of the year in which the award is made. Forms may be obtained from the SEG Foundation Office,
PO Box 702740, Tulsa, OK 74170-2740, USA, or downloaded from the link below.

The SEG Scholarship Committee selects the recipients of the awards. The committee is composed of eight members of the Society of Exploration Geophysicists who are appointed by the chairman of the committee. Members of the committee or members of the Foundation Board of Directors are not allowed to participate in the selection of recipients of awards sponsored by themselves or their companies.

Administration of each scholarship is turned over to the school attended by the recipient. The school retains custody of the funds, authorising withdrawals by the

student and remitting to the student any residual amount upon the satisfactory completion of the term of the scholarship. The school is requested to report the recipient's grades to the Foundation Office at the end of each semester.

A scholarship may be withdrawn and any unused balance refunded to the Foundation if:

- The holder changes his or her college courses from those directed toward a career in geophysics to another field of study.
- The holder enrolls in a different school and/or pursues a curriculum other than what he or she listed at the time of initial application, and no longer meets the requirements set forth by the sponsor of the scholarship.
- The holder fails to remain in good scholastic standing; to this end, the holder must see that a report of his or her grades is furnished to the Scholarship Committee at the end of each semester.
- The holder conducts himself or herself in such a way as to embarrass the Society of Exploration Geophysicists or the sponsor of the scholarship.

General requirements for eligibility:

A student must intend to pursue a college curriculum directed toward a career in exploration geophysics.

A student must meet one of the following requirements:

(a) Attending high school and planning to enter college next fall.

(b) An undergraduate or graduate college student whose grades are above average.

Certain scholarships administered by the SEG Foundation may impose additional eligibility requirements as set forth by the sponsors of those awards.

Appendix 5

The Geological Society of London Research Funds

http://www.geolsoc.org.uk

Applications are invited for the Society's annual grants in support of geological research.

Society research funds 2005

Applications for research funds should be addressed to the Awards Secretary at the Geological Society; they should be accompanied by a statement of the programme of work intended, the sum requested and two letters of support from Fellows who are known to officers of the Society.

No printed application forms are issued. In order to be considered at the committee meeting, applications and supporting documents should reach the Society no later than 1 February, 2005. In the past the average award has been about £1000.

The following Funds are available for application:

W.G. Fearnsides Fund
To advance geological science.

E.J. Garwood Fund
For the encouragement of research in stratigraphy, with palaeontology, and in physical geology. Must be between 28 and 51 years of age.

Gloyne Outdoor Geological Research Fund

For the prosecution of outdoor research preferentially of a palaeontological or stratigraphical character, and preferentially within the limits of the British Commonwealth.

Annie Greenly Fund

For detailed geological mapping.

Timothy Jefferson Field Research Fund

Must be under 28 years of age; for a field project for research in Earth Science. Not for military activity or development.

Elspeth Matthews Fund

For members of the Society for geological field-based research anywhere in the world. Preference for those under 30 years of age.

Daniel Pidgeon Fund

To promote original geological research. Must not be more than 28 years of age.

J.B. Tyrrell Fund

To assist geologists of Great Britain and Ireland to travel to and in Canada; or to assist in the publication of meritorious papers by geologists of Great Britain and Ireland upon the geology of Canada; or to assist such geologists in any other way best adapted to further this object.

Appendix 6

Other Funding Agencies and their Contact Information

Funding Agency	Contact Information
African Academy of Sciences (AAS): CBFR Fellowships and SWM Fellowship	PO Box 14798 Nairobi, Kenya Tel: 254.2.8844015 Fax: 254.2.884406 Email: aas@africaonline.co.ke
African Capacity Building Initiative Program for African Universities	www.fordfound.org www.macfound.org www.carnegie.org http://www.rockfound.org
Alexander von Humboldt Foundation: Humboldt Research Awards George Forster Fellowships	Selection Department Jean-Paul-Strasse 12 - D-53173 Bonn (Bad Godesberg) Tel.: +49 (0) 228-833-0 - Fax: +49 (0) 228-833-212E-mail:humboldt-award.select@avh.de-Internet: http://www.humboldt-foundation.de
Association of African Universities (AAU) and USHEPiA (University Science, Humanities & Engineering Partnerships in Africa): Fellowships for Research Reporting and Writing	AAU-Africa Office Room 3.06 International Academic Programmes Office, Kramer BuildingUniversity of Cape Town, Private Bag, Rondebosch 7700, South Africa Tel: 27.21.650.2822. Fax: 27.21.650.5667 Email: nan@protem.uct.ac.za

Awwa Research Foundation	6666 W. Quincy Avenue, Denver CO 80235Tel: 3033476100 Fax: 3037300851 http://www.awwarf.org/research/ projectAdmin/proposalGuidelines.aspx
Belgian Fellowships The Vlaamse Interuniversitaire Raad (Flemish Interuniversity Council, VLIR)	Email scholarships@vlir.be Website: http://www.vlir.be
Bill & Melinda Gates Foundation: Five College African Scholars Residency Program	http://www.fivecolleges.edu/asp/ http://www.gatesfoundation.org
British Council Chevening Scholarships	www.chevening.com
British Petroleum BP Conservation Program to Fund Student-Led Research Teams	http://conservation.bp.com/
Center For Development Research ZEF: Ph.D. Fellowships for Developing Country Students	Dr. Günther Manske Co-ordinator International Doctoral Program for for Development Research (ZEF) Walter-Flex-Street 3, 53113 Bonn, Germany Tel.: ++49-(0) 228-73-1794 or 1727 Fax: ++49-(0) 228-73-1889 Email: docp.zef@uni-bonn.de
Commonwealth Scholarships and Fellowship Plan: Commonwealth Scholarships, Fellowships and Academic Staff Scholarship	Ministry of Education, Federal Scholarships Board, ABUJA

Commonwealth Foundation (CF) Professional Exchange Response Grant	http://www.commonwealth foundation.com/ The Commonwealth Foundation Marlborough House Pall Mall London SW1Y 5HY Tel: 44.0.207.930.3783 Fax: 44.0.207.839.8157 Email: geninfo@commonwealth.int
Echoing Green Foundation: Fellowships	198 Madison Avenue, 8th Floor New York, New York 10016 Tel: 212.689.1165 Fax: 212.689.9010 Application inquiries: 212.792.8580 E-mail: general@echoinggreen.org Internet: http://www.echoinggreen.org/
Environmental Research and Education Foundation: Francois Fiessinger Environmental Fellowships	http://www.erefdn.org/scholar.html 4301 Connecticut Avenue, NW, Suite 300 Washington, DC 20008 Tel: 202.364.3789
Eppley Foundation: Advanced Research in Physical and Biological Sciences	Secretary Eppley Foundation 245 Park Avenue New York, New York 10167-0034
Five Colleges African Scholars Residency Program: Research Projects with an African Focus	(http://www.gatesfoundation.org). See also: http://www.fivecolleges.edu **Contact information:** Nathan A. Therien, Director for Academic Programs, Five Colleges, Incorporated E-mail: ntherien@fivecolleges.edu. The African Studies Council is chair Elliot Fratkin (smith College) efratkin@sophia.smith.edu.

Ford Foundation International Fellowships Program (IFP)	http://www.fordfound.org
Fulbright Scholar Program: Grants in 140 Countries for Faculty and Professionals	www.cies.org Council for International Exchange of Scholars (CIES) 3007 Tilden Street, NW, Suite 5L, Washington, DC 20008-3009. Telephone:202-686-7877 E-mail: apprequest@cies.iie.org.
German Academic Exchange Service: Scholarships to students, trainees, young academics, lecturers and professors as a way of promoting continuing education and training in the field of higher education as well as research.	Deutscher Akademischer Austauschdienst (DAAD),Kennedyallee 50, D-53175 Bonn, Germany. Mailing address: P O Box 20 04 04, D-53134 Bonn,Germany. Tel: ++49-228-882-0 Fax: ++49-228- 882- 444 http://www.daad.de
German Research Foundation: The DFG is the central self-governing organisation of German science. It serves all fields of science and the arts. It supports and coordinates research projects in all disciplines, especially in the area of basic research, but also in applied research.	Deutsche Forschungsgeneinschaft (DFG),Kenneydyallee 40, D-53175 Bonn,Germany. Tel: ++49-228-8851 Fax:++49-228-885 2221 http://www.dfg.de/english/
International Development Research Centre: IDRC Doctoral Research Awards	DRC Doctoral Research Awards Centre Training and Awards Program International Development Research Centre 250 Albert Street Ottawa Ontario K1P 6M1 Canada Phone: 1 (613) 236-6163, ext. 2098 Fax: 1 (613) 563-0815cta@idrc.ca

F.S. Idachaba Foundation for Research and Scholarship: The F.S Idachaba Foundation for Research and Scholarship (IFRES) is a not-for-profit research and scholarship support organisation that explores new ways of conducting and supporting research and scholarship in Nigeria and other sub-Saharan African countries. The Foundation seeks to promote development through research and scholarship that enhance the well-being of Nigerians in particular, and of Africans in general.	Assistant Programme Officer, F.S. Idachaba Foundation for Research and Scholarship (IFRES), 47 Francis Okediji Street, Bodija, UI PO Box 19906, Ibadan. e-mail: ifres@skannet.com Website: www.idachabafoundation.org
International Federation of University Women: Dorothy Leet Grants.	8 rue de l'Ancien Port Geneva CH 1201 Switzerland Tel: 41.22.731.23.80 Fax: 41.22.738.04.40 Internet: http://www.ifuw.org
International Foundation for Science	Scientific Programme Coordinator International Foundation for Science (IFS) Grev Turegatan 19 SE-114 38 Stockholm, Sweden Tel: +46 (0) 8 545 818 10 Fax: +46 (0) 8 545 818 01 E-mail: eren.zink@ifs.se Web: www.ifs.se
Japan International Cooperation Agency (JICA): Fellowships	http://www.jica.go.jp/english/index.html
Japan Society for the Promotion of postdoctral.html Post-doctoral Fellowship for Foreign Researchers	http://www.jsps.go.jp/e-fellow Science:
King Faisal Foundation: King Faisal International Grants	http://www.kff.com Grants Administrator, King Faisal Foundation, PO Box 352, Riyadh11411 Saudi Arabia Tel: 966-1-465-2255 Fax: 966-1-465-6524 E-mail: info@kff.com

Leverhulme Trust Visiting Fellow	http://www.leverhulme.org.uk/inte2.html
NASA Training for Developing Country Scientists in GIS, Remote Sensing Technology and GPS Data Collection	http://geo.arc.nasa.gov/sge/health/chaart.html. NASA Ames Research Center Moffett Field, CA 94035-1000 Tel: 650.604.5896 Fax: 650.604.4680
National Science Foundation (NSF) International Opportunities for Scientists and Engineers	**www.nsf.gov**
Netherlands Fellowships Programme Training of Developing Country Nationals	http://www.nuffic.nl
Netherlands Foundation for the Advancement of Tropical Research	WOTRO, Netherlands Foundation for the Advancement of Tropical Research P.O. Box 93138, 2509 AC Den Haag, The Netherlands Tel. (+ 31) 70 34 40 763 / Fax. (+31) 70 38 19 874 Internet: http://www.nwo.nl/wotro
Royal Society: International Grants Programmes for East, South East Asia and the Developing World	www.royalsoc.ac.uk
Santa Fe Institute (SFI): International Research Fellowship Opportunities	http://www.santafe.edu/sfi/education/international/intlfellows/intlfaldescription.html International Fellowship Program, Santa Fe Institute, 1399 Hyde Park Road, MS#2, Santa Fe, New Mexico 87501, USA, Telephone: (505) 984-8800 ext. 235 (voice), Fax: (505) 982-0565 America
Smithsonian Institution Research Fellowships and Grants	Office of Fellowships Smithsonian Institution, 750 9th Street NW Suite 9300, MRC 902 PO Box 37012 Washington, DC 20013-7012 Tel: 202.275.0655 Fax: 202.275.0489 email: siofg@si.edu

Swiss Agency for Development and Cooperation (SDC): Research Fellow Partnership Programme for Agriculture –	The Executive Manager Swiss Centre for International Agriculture (ZIL) ETH-Zentrum, UNA C4, CH-8092 Zürichtel. +41-1-632 7935email erika.krause@agrl.ethz.ch
Third World Organisation for Women in Science: Fellowships for Women Scientists in sub-Saharan Africa and Least Developed Countries (LDC) at Centers of Excellence in the South	TWOWS Secretariat, a Enrico Fermi Building, Room 109 Via Beirut 6, 34014 Trieste ITALY Tel: 39.40.2240.321 Fax: 39.40.224559 Email: info@twows.org
United Nations University: Institute of Advanced Studies Fellowships	United Nations University / Institute of Advanced Studies UNU/IAS 53-67 Jingumae 5-chome Shibuya-ku Tokyo 150-8304JapanTel: + 81-3-5467-2323 Fax: + 81-3-5467-2324 E-mail: unuias@ias.unu.edu
US Agency for International Development (USAID): 380 Lexington Avenue Advanced Training for Leadership and Skills (ATLAS) Fellowships	ATLAS, Chief of Party The Africa-America Institute New York, NY 10168-4298 Tel: 212.949.5666 Fax: 212.818.9505 Email: atlas@aaionline.org
Volkswagen Foundation: Promotion of science and technology in research and teachings through research grants	VolkswagenStiftung Kastanienallee 35 30519 Hannover Germany Telefon 0511 / 8381-0 Telefax 0511 / 8381-344 E-mail info@volkswagenstiftung.de http://www.volkswagen-stiftung.de