

# RESEARCH METHODS AND TOOLS IN GEOGRAPHY

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Geographers work in many different areas, such as environmental management, education, disaster response, city and county planning, community development, and more! Geography is an interdisciplinary field that offers diverse career opportunities. Hence, geographers should be well trained and equipped with the latest research methods and tools to investigate the geospatial phenomenon and come out with proper prognostication of natural and built surroundings with reference to or for social development.

Geography, as a discipline of study, has evolved over time and expanded its horizon with the development of science and technology. The earlier limitation of gaining knowledge through travel accounts about the land and people distributed all over the globe could be comprehended in great details with the scientific and technological development in the field of Geoinformatics using its tools like Satellite Remote Sensing, GIS and GPS. Maps have been the tools of Geographers and they will continue to remain very important tools for studying space. The traditional cartography has given way to computer cartography; hence, the process of making maps has become quicker. Techniques also, in general, have undergone unprecedented change. Geographers use many tools and techniques in their work, and geographic technologies are increasingly among the most important emerging fields

for understanding our complex and ever changing world. They include Geographic Information Systems (GIS), Remote Sensing, Global Positioning Systems (GPS), online mapping such as Google Earth, and others. The Remote Sensing has made the data collection easier and GIS has provided large scope for searching explanation. These tools can be very effectively used, provided the researcher has clear theoretical understanding of the phenomena. The traditional studies in geography were more of empirical nature. But empiricism also requires some theoretical format to proceed.

Geography research, like research in other disciplines, faces severe pressures from inadequate funding, but these are compounded by the fact that teachers in higher education are obliged to divert ever-greater amounts of their time and energy into such non-teaching activities as entrepreneurship, and administering scarce resources. In saying this, we recognize that teaching at this level has always been a part-time occupation in the sense that, besides teaching, its practitioners are also required to undertake administration and research as part of their job specification. Our experience, however, suggests that these pressures have intensified to the point at which the priority and *value* placed on teaching are under attack and, in turn, the quality of education and research offered to students is being diminished.

It is the common belief that research has been consistently undervalued in geographical higher education. This note address primarily with the practicalities of research in general and with a current, or prospective, interest in geography research in particular. This note is a direct response to these new circumstances. It is based on three interlinked premises:

- first, that research is important rather than merely inescapable;
- second, that failure to pause and think about what we are doing actually makes the task of research far more difficult and;
- third, that improved methods and techniques in analysis of data makes research easier and more fun for all concerned.

In designing a curriculum for research students, one reflects on a host of questions besides the specific content of individual courses - questions which might well include the following.

- What is geography research supposed to achieve?
- Is there a single objective or should a diverse range of objectives inform curriculum design and research practice?
- Are we concerned with the development of a core research curriculum or with a curriculum designed to meet individual's wants and needs?
- What are to be the aims and objectives and how are they translated into the curriculum?
- How can we design courses that will allow creative research in circumstances in which, as noted above, professional geographers are likely to be under

growing institutional and external pressures to give priority to research activities other than only routine teaching?

Geographers have long regarded fieldwork as being central to their teaching and research and as something intrinsic to the very nature of being a geographer. It is said that 'the principal training of the geographer should come, wherever possible by doing fieldwork'. The literature suggests that geographical fieldwork can be used to address many educational objectives and, indeed, field education is often justified by appeals to these multifarious objectives:-

- Developing observation skills
- Facilitating experiential learning
- Encouraging students to take responsibility for their own learning
- Developing analytical skills
- Experiencing 'real' research
- Developing a respect for the environment
- Developing personal skills
- Breaking down barriers

Thus it is argued by many geography associations in the world that: 'Awareness and understanding of, and concern and eventual responsibility for 'real places' can only be achieved through direct contact. There is not and there cannot be any substitute for the immediacy of field experience.'

Collectively, these reasons suggest that fieldwork can have enormous educational potential but, equally, can be completely sterile if not planned and executed sensibly. The advantages should not be assumed to accrue irrespective of how fieldwork is

conducted. It has limitations like any other form of instruction, and the supervisor's job is to find out which of these goals are best achieved in the field and how they can be realized, also what kind of research methods and tools to be used to investigate the problem.

Key Features in Scientific Research Methods in Geography should:

- Provides a broad and integrative introduction to the conduct and interpretation of scientific research in geography
- Covers both conceptual and technical aspects, and is applicable to all topical areas in geographic research, including human and physical geography, and geographic information science
- Discusses all parts of the research process, including:
  - Scientific philosophy
  - Basic research concepts
  - Generating research ideas
  - Communicating research and using library resources
  - Sampling and research design
  - Quantitative and qualitative data collection
  - Data analysis
  - Display and interpretation
  - Reliability and validity
  - Using geographic information techniques in research
  - Ethical conduct in research

Research Training to be designed to encourage interaction, with the emphasis on student's involvement and hands-on experience. Along with the aim of training

in a range of research skills, the programme should give emphasis on networking - encouraging students to develop links with each other and with members of staff. Exchanging ideas about research experience is an invaluable method of gaining knowledge, and the training programme should provide a unique multi-disciplinary environment that fosters these exchanges.

### **Training workshop for developing research skills in researchers of Geography**

To prepare today's students for tomorrow's workforce, the challenge for geography educators is one of connecting disciplinary instruction with more general training that yields marketable and valued skills in the modern workplace. Geography is experiencing resurgence as an academic discipline for tackling issues of local, national, and global significance by attracting scholars drawn to its conceptual frameworks for interdisciplinary and integrative research. Geographers need to be prepared with GIS, cartography, spatial analysis, programming, data management, and quantitative skills.

The course should be intended for students who have a substantial background in geography or a related discipline with a good first degree. It aims to provide:

- i. broad-based training in geographical research, its philosophical backgrounds and debates, and interpretation of geographical literature,
- ii. comprehensive training in research methods in physical as well as human geography and the social sciences as a whole, and
- iii. the opportunity to develop large scale research management skills by

completing a research thesis under academic supervision and guidance.

The aim of the course should be to develop general transferable skills in the research students which would give them employment in various fields. Hence the training workshop can be used as a vehicle for developing the plans and research design for subsequent doctoral research.

The course should be intended to give students a broad-based advanced training and critical awareness of geographical research and its methods, including awareness of the research methods of related disciplines. As this training workshop is for targeted researchers – admission should be based on some prerequisites – like applicants should submit their synopsis and research plan clearly indicating their area of interest in investigating physical or human geography problems. This will include a review of the relevant literature, research questions, an outline and evaluation of appropriate research methods, and an assessment of the initial findings and their significance.

The course aims to develop further the researchers' understanding of the relationship between society, nature and space, emphasising both global and local processes and connections. They will develop further their skills of assessing the merits of contrasting theories, explanations and policies; collecting and critically judging, evaluating and interpreting varied forms of evidence; preparing maps and diagrams; employing various methods of collecting and analysing spatial and environmental information; combining and interpreting different types of evidence to tackle specific problems; recognising the ethical and moral dimensions of study.

**Tentative Lecture Modules for the proposed training of researchers of geography and other allied disciplines may include:**

- Managing Ph. D.
- Introduction to information skills
- The nature of enquiry and explanation in the social sciences
- Qualitative methodology in the social sciences
- Introduction to quantitative methods
- Managing personal development
- Academic writing and self-editing your thesis
- Organizing a Fieldwork
- Research in the wider context
- Risk management in research projects
- Introduction to GIS and other spatial research tools
- Research ethics in a wider context
- Final stages of a PhD

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