

Researching into the future

Universities, industry, government and non-governmental organisations all rely on research activity, **DR PAUL GREER** gives an overview of this growing career field

Research involves an impartial and systematic investigation of a topic or phenomenon. It can be undertaken on virtually any aspect of life or behaviour, though much of paid research takes place in the fields of science and technology. A large proportion of research generally is undertaken by universities, professional bodies, and the larger industrial and commercial organisations.

Researchers strive for objectivity, taking considerable pains to collect, analyse and present evidence, to give a picture which is true rather than merely consistent with what they already think, or just to the advantage of their employers. The scope and depth of good research encourages meaningful and worthwhile answers to the questions that it poses.

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It is sometimes hard to do original research, since few phenomena have not already been examined to some degree. However, in some fields even small-scale projects can make a contribution. Where research is repeated, this is often to test the methods or results of an earlier investigation. In such cases, comparable results strengthen the credibility of both efforts, while discrepancies prompt further research, possibly more carefully-undertaken or precisely-targeted.



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Why is research important?

In a world where information and arguments put before us are often selective or otherwise distorted, research strives for an accuracy and honesty which help us broaden our knowledge, and make appropriate decisions. It also helps us track progress and modify or eliminate less-than-effective activities and methods. It also alerts us to any potential dangers, such as pollution levels or climate change, which can in turn

prompt to action governments, commercial organisations, or even charities.

Adrian, who works as a full-time researcher in a large university, reflects this: “Research has become more significant in a lot of fields during the past 20 years or so with the development of IT. I find it very easy not only to acquire and analyse data, but also to compare it with other findings elsewhere.”

Researchers also contribute to the

status of their work by networking through professional journals and conferences. Because of the necessary degree of specialism in many fields, the scope of these is often worldwide.

Who employs researchers?

Researchers can be employed full-time, or engaged for a period considered sufficient to complete an agreed project – from a few weeks to several years. Providers of goods or services require research to be ongoing, to develop new lines and guarantee quality and safety. A large food or drug company, for instance, would almost certainly employ full-time researchers; by contrast, a small company needing to address a specific problem (such as falling sales) might engage a university or research organisation to find reasons for and solutions to this. Many university departments, in fact, augment their income in this way.

The Government employs many researchers, directly or indirectly, particularly in fields such as health, transport, education, productivity and economics. Besides field specialists, those whose skills are broadly applicable such as statisticians, are also in demand.

What is involved in setting up a research project?

Most projects, whatever their scale, entail discussions and planning, choosing data collection methods, data collection and analysis, identification of trends, conclusions, and report-writing. Careful planning is essential to a successful research project, as without a clear understanding of purpose, resources and methods, as well as the potential application of findings, it is likely to be of limited worth.

One of the responsibilities of Suzanne, who works in the research department of a busy company, is to allocate resources for projects: "I need to ensure the necessary specialist staff are available, how big a team will be needed and for how long. I have to check that equipment is working and premises are free. Sometimes the help of someone



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outside our organisation is needed, so some negotiation has to be done. I have to have a sense of possible outcomes at each stage of the investigation, and set deadlines which are realistic."

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Major research projects may involve cooperation between, or among, universities and/or governments in different countries. An

understanding of local laws or politics may also be just as essential as technical knowledge to the ultimate success of a project. While negotiation and compromise may be expected on a large-scale, small-scale projects are often more reliant on well-motivated researchers who are good organisers and able to work independently.

What qualifications do researchers need?

Preferred qualifications are stated by recruiters for individual posts, but are generally high, with even a research assistant likely to have a degree, and

perhaps a postgraduate or vocational qualification. Researchers in the science field tend to be highest-qualified, and a scientist working independently on a project would be likely to hold a doctoral degree (PhD) in a field such as biology, chemistry or physics, or, more likely, a recognised subdivision, such as molecular biology, colour chemistry, or nuclear physics. Outside the sciences, a doctorate is less vital, but many researchers hold a Master's degree, usually obtained through a year's full-time study or two years' part-time. In some fields, hands-on experience can valuably complement specialist knowledge, education being an example, with most researchers having been teachers or spent time in some similar role.

Which qualities are necessary or helpful?

Researchers must be able to think clearly and intelligently to devise a workable research plan, and must have the self-discipline to carry this through, often over a long period.

They must be constructively optimistic and be able to avoid discouragement when information is hard to come by or results are slow to appear. From the main research question, they must formulate sub-questions to elicit appropriate data, and many projects throw up figures requiring skillful analysis, manipulation and presentation. Sometimes a statistician will be employed to do this, but in many projects this too will

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be the responsibility of the researchers.

Aptitude with key software and research packages can be especially useful here. Researchers must also be responsive and adaptable as their research progresses, and finally, be able to express themselves and their work in spoken and written form, sometimes

for people who have only a sketchy idea of what they are trying to do.

Recent research fields

Technical breakthroughs like unmanned landings on distant planets, cars run on non-fossil fuels, the Human Genome Project, and alarm about reading standards, childhood obesity, and the "pensions crisis" are instances of research making headlines.

Some research influences popular debate and even government policy, as well as introducing practical alternatives or refinements. However, researchers may have to be philosophical when those in power decide not to act on their findings. A recent issue of *The Times Higher Education Supplement* advertised posts for research projects on topics as diverse as: empowering mental illness service users, credit risk for consumer loans, problem-based learning in physics, the impact of higher education, e-learning and organisational change, and the use of ICT in arts and humanities research.