

Introduction

Research has been one of higher education's two 'missions' since universities were first established. Universities undertake different kinds of research for different purposes. This can be classified into two groups: **basic and applied research**. **Basic, or 'blue-skies' research**, describes experimental or theoretical work undertaken primarily to acquire new knowledge without any particular application or use in view. For example: the determination of the amino acid sequence of an antibody molecule would be basic research. **Applied research** is also original investigation undertaken in order to acquire new knowledge but it is directed primarily towards a specific practical aim or objective. To continue the example: applied research would involve investigations to distinguish between antibodies for various diseases. However in practice the boundaries between basic and applied research are subjective and often difficult to define. Basic research can produce outcomes with specific applications and applied research can also have implications for basic research.

Knowledge transfer is now described as higher education's 'third mission'. It involves translating the knowledge that exists in universities, whether it's research outcomes, academic expertise or recent graduates into useable outputs for the benefit of those outside the sector including business and industry, government, public bodies and others. A separate introduction to knowledge transfer is available from Universities Scotland.

Assessing the quality of academic research

The quality of Scotland's research is measured internationally in a UK-wide peer-review process called the Research Assessment Exercise (RAE). The RAE is the principal means by which institutions assure themselves of the quality of the research undertaken in the HE sector. The outcomes also inform how the Funding Council's main Quality Research grant is allocated to institutions.

The RAE uses expert peer review panels to determine the relative amounts of national and international research activity of each research department. The last RAE was undertaken in 2001 and considered the work of almost 50,000 researchers in 2,598 submissions from 173 HEIs. The research was rated against a seven-point scale starting 1, 2, 3b, 3a, 4, 5 up to 5* in ascending order. Departments rated 4, 5 and 5* represent levels of international excellence. The outcomes of the next RAE are due in December 2008. The 2008 RAE process differs quite significantly from that which took place in 2001 as it has been adjusted to take account of equalities legislation. The seven point scale will be replaced with a 'graded profile' which will remove the 'cliff-edge' effect where quality judgements made at grade boundaries can have significant funding impacts.

Further changes to the RAE are planned beyond 2008. The new process will be called the Research Excellence Framework (REF) and will take account of key differences between the different disciplines. Assessment and funding of the science-based disciplines will be driven by research income, research student data and a new bibliometric indicator of research quality. The arts, humanities and social sciences will retain a light-touch form of peer review as quantitative approaches are less developed. It's expected that the new Framework will be phased in across the UK from 2010. The Higher Education Funding Council for England was consulting on these proposals in late 2007/early 2008.

How research activity is funded in universities

Scottish higher education institutions receive some public funding for research from the Government however they also compete for private funding from a range of sources.

Dual support system of publicly funded research

Higher education research funding in the UK is administered under a dual support system which provides funds to institutions in two streams.

One stream is classed as core public funding and is distributed by the four UK Funding Councils. The largest grant distributed by the Scottish Funding Council for research is the Main Quality Research Grant (QR) which totalled £188.7 million for the Scottish sector in 2007/08. It is distributed according to the excellence of individual departments in higher education institutions, using the results of the Research Assessment Exercise (RAE). This source of funding helps support the research infrastructure and enables institutions to undertake basic and applied research in keeping with their own missions and also provides the capacity for institutions to take on research commissioned by the private sector.

The other publicly funded research stream available is from the UK Research Councils. There are seven UK Research Councils that invest around £2.8 billion in research covering the full spectrum of academic disciplines. Research funds are awarded to successful researchers on the strength of their applications and research potential which is assessed by independent, expert peer review. In 2005/06 the UK Research Councils awarded £134 million worth of funding to researchers in Scottish higher education institutions.

A key feature of the dual support system, which is also considered to be one of its main strengths, is that the Funding Council grant is for the university to spend entirely at its discretion. This means that there are multiple sources of funding for research, with multiple points of decision about what research should be supported and where research resources should be concentrated.

Research income from private sources

Scotland also wins significant levels of research funding from other sources including UK based charities, UK industry, commerce and public corporations, European sources and others to the value of £255 million in 2005/06. Income won in this way is like a commercial transaction and the funding earned relates to the specific research project. As with funding from UK Research Councils, Scottish institutions compete against other UK universities and other research organisations to win these contracts and so Scotland's proportion of income can be seen as a proxy for research quality. Scotland's performs above its weight on these measures winning 12.6 per cent of all income awarded to UK universities from UK charities, 13 per cent from UK industry and 12.3 per cent from EU sources.

New initiatives in research: Research Pooling

The concept of research pooling was established in Scotland in 2004 as a collaborative way of working to strengthen the critical mass of Scotland's research base and achieve better value from public investment in research activity. The initiative also helps to strengthen Scotland's ability to compete internationally and attract the best in research talent from overseas. This initiative has been very successful and there are currently eight successful research pools in Scotland in the areas of mathematics, chemistry, physics, economics and life sciences with two more currently under development.