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IN-BRIEF
REsource

Europe in pursuit of excellence

Abstract

On 22 February 2006 the European Commission proposed to the European Council the creation of a European Institute of Technology to rival the world's premier technology institutes. The EIT would have access to cutting-edge research facilities, attract the world's top scientists and train the researchers of tomorrow.

Many interested parties have contributed to the debate, including RAND Europe. Its research findings are presented in a Working Paper (WR-346-RE) available at www.rand.org/pubs. This In-Brief REsource forms the basis of an opinion editorial, which appeared in the *Financial Times* on 22 February 2006.

A new Einstein lives in America. His name is Edward Witten. He is one of the world's most preeminent mathematical physicists, whose work has received almost every conceivable prize available within his discipline. Witten is affiliated with the renowned Institute for Advanced Studies (IAS) in New Jersey, where Einstein worked after he fled Germany. Several years ago Witten 'temporarily' left the IAS to work for another robust institution: the California Institute of Technology (Caltech). Caltech managed to lure Witten to join as a visiting professor with enticements of a salary increase and the chance to start a large research group.

Witten is no exception in this respect. America's top universities compete with each other for the world's best researchers. They are willing to pay the 'market value' for top scientists, in the same way as Europeans pay for top football players. But it's not just the salary that is used in the battle for the best scientists; large research funds and promises of cutting edge facilities are also strong incentives.

The results are clear: According to a 2005 academic ranking, seventeen of the world's twenty top universities are located in the US, two in Europe and one in Japan. From 1901–1950, 73% of the Nobel Prizes in science went to European researchers. This declined to just 20% in the last decade. Furthermore, 60% of European engineers and physicists conducting their PhDs in the US say that they intend to stay there. This 'brain drain' phenomenon is causing serious concern in Europe and is one of the contributing factors resulting in an estimated shortage of 500,000 engineers and scientists within ten years.

Recognising the dangers to future European innovation, competition and economic growth, EC president Barroso has proposed the creation of a European Institute for Technology (EIT). Mr. Barroso wants the EIT to be up and running by 2009, and to function as a 'pole of attraction for the very best minds, ideas and companies from around the world.'

How do you create excellence in science and education and is the proposed format for the EIT appropriate? RAND Europe has researched the issue and found that the creation of a world-class institute requires a university model that is radically different from the typical European one. Research shows that what distinguishes top institutes is the ability to support world-class research facilities and attract superior student and faculty talent. These characteristics are made possible by a broad funding base; performance-based payment; a highly selective admission process; competition in research funding; freedom in academics and governance; and focus in research. Fundamental cultural change is required to bring about this kind of model.

While no decision has yet been made, Mr. Barroso has expressed his intention not to reinvent the wheel. That's to say of his position: elaborate on what already exists and combine the best forces in the interest of time. Many voices in Europe indeed argue that the EIT should be based on networks of existing European top universities, either at the university, departmental or research team level. However, it is doubtful whether institutions of a traditional European format, with vested interests, have the necessary innovative power, let alone the will, to cooperate and find consensus.

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Furthermore, past attempts to enhance coordination by strengthening networks of universities have resulted in allocating resources over broad research fields and many institutions without producing clear benefits. RAND Europe's research shows that focus and concentration of talent and resources are essential. Creative processes require physical proximity which even advanced Information Communication Technology (ICT) cannot overcome. In other words, a physical rather than a virtual format ought to be sought.

To emulate the world's best, Europe should not base the EIT on existing entities, but instead build a new institute from scratch. A comparison with young successful institutes based on this new model, such as the INSEAD business school, suggests that a top institute can function well within a decade and be part of the world's elite within twenty years. Such a top-down initiative should be complemented with a strictly bottom-up approach to setting the research agenda, letting top researchers decide on their priorities. The EIT can set an example and encourage imitation on a regional and national scale.

The EC's recommendation on the EIT will be made soon. Europe must have the strength to start something new or not act at all. The difficulty of reaching a shared and courageous vision is not unfamiliar to Europe. However, without it, there is the danger of turning the EIT into a potentially wasteful compromise of vested interests. A thorough and objective feasibility study will be crucial to precede the political wrangling over interests, locations, models and budgets.

If the Commission does not have the courage to do this, national governments will need to take up the challenge in the Council of Ministers, for the sake of excellence. But as things stand, compromise is likely to reign and Nobel Prizes for sciences, as well as Edward Witten, will remain in America.

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