

# Pinnacles or plateaus?

When looking at the research communities of many countries, two different models prevail in the way that science is organized and funded. Some countries—particularly the USA and the UK—support a select group of institutes that are widely considered to be ‘the elite’ in the communities that they serve. These places are the ‘pinnacles’ that rise above the rest and attract the most funding, the best researchers and the best students.

In other countries, such as Germany or Canada, the ‘plateau’ model predominates. There are many excellent locations for conducting research, but the differences between them are less pronounced. Countries that adopt the plateau model can obviously have a high scientific output, but their lack of well-known, iconic locations—akin to Harvard, Cambridge or Stanford University—makes them seem less interesting to politicians, funders, high-flying scientists and students.

The question then is, what is the best way to organize science? Should countries focus on creating an elite of well-funded, attractive locations that take the best researchers and win the biggest grants? Or should financial and intellectual resources be distributed more democratically? In the current climate, it seems that the pinnacle model is the most popular among those who organize and fund scientific activities. Creating elite institutions has a nicely visible outcome, and precedents show that it can be very effective.

Germany has been actively promoting the concept of elite universities in recent years, and has designated five institutions that will receive additional support from the government. In Europe, the original idea of a European Institute of Technology (EIT) was to create a highly visible and presumably well-funded research centre, but this has evolved into a more diffuse

concept due to political realities—partly to avoid the question of which country would host the EIT. Perhaps similar realities have driven a different policy, especially in Scandinavian countries, to create universities in almost every region with a relatively even distribution of finances and resources between them.

If pinnacles have the benefit of hosting clusters of leading scientists, plateaus serve a different purpose. They are an essential part of regional infrastructure policy and ensure that scientific competence is widely dispersed and accessible. Furthermore, they can trigger local economic growth. A university, even if it is not a leading institute by world standards, brings a degree of prestige to a city, as well as educated staff and the energy of a student population. It also creates greater cultural diversity and, significantly, increases the attractiveness of a city to industry.

Another factor to consider is the training of PhD students, who are much needed by the new economies—based on knowledge and innovation—to attract mobile research-based industries. Increasing the number of people with a scientific PhD in a country not only requires increasing the number of students in the sciences, but also the number of senior researchers available to train and mentor them. The plateau model is much better suited to this task because the number of qualified scientists that many good institutions can appoint is greater than the number that can be appointed by a few elite ones.

Furthermore, if the best scientists in a country are dispersed among many institutes, they can have a positive and stimulatory role on colleagues who might otherwise eventually lower their ambitions and perform only unchallenging and uninteresting research. Of course, the opposite can also happen, whereby the motivated researchers realize that there is little to gain

by competing from within a weak institute and either lower their standards or move to a pinnacle institute. A weak institution therefore has to make a special effort to provide sufficient funding and ensure that the necessary equipment is available in order to retain its best scientists.

Clearly, it is financially challenging to bring all the universities in a country up to the high standard required for world-class science. Therefore this constraint makes the idea of having a few beacons of scientific endeavour more attractive—if the focus is not on the sociological consequences of research policy.

The ideal would be to combine both systems and have a few elite pinnacles rising from a generally high plateau. If a country’s research base is already on a high elevation, raising a few pinnacles can be done easily and will have a rapid impact on overall research output. But this requires significant investment and long-term support to ensure that the system is maintained once it has established momentum. However, in a country where the overall research is weak, it would be more efficient to raise the overall average quality rather than support an isolated prestige institute.

What does not work is marketing an institute as a bright star, but not giving it the financial backing to achieve that status. Policy-makers should be clear about what model they prefer and recognize the difference and funding consequences between creating an environment for a few world-class researchers and providing training for a broad and well-educated workforce. Long-term, stable investment strategies must be established both for the pinnacles and the plateaus if the real aim is to raise the level of international competitiveness.

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