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It's time to recognise the diversity of research careers

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Research evaluation values leadership and excellence, putting those with specialist skills at a disadvantage

Academic career paths are often thought of as homogenous trajectories, particularly when assessed by funding agencies and other organisations evaluating research. But simply grading success through scientific excellence or academic leadership ignores the diversity of roles and activities that researchers perform.

This fixation on excellence and leadership is an example of the 'halo effect', where it is believed that excelling in research performance means researchers will automatically excel in other activities such as teaching or social outreach. But whether this is actually the case is up for debate.

We would call for the design of more holistic research evaluation schemes that are open to the diversity of career profiles.

A collective effort

In research evaluation assessments, productivity is measured by the number of publications an individual produces, while scientific impact is measured by number of citations publications accrue. This individual-based approach runs counter to the fact that research is a team effort in which scholars play different roles based on the different research tasks they perform.

The tasks researchers perform vary widely, from designing and leading research agendas, to developing new tools for data collection and processing, to coordinating teaching programmes and engaging with non-academic stakeholders. But just because researchers perform all these tasks does not mean that each researcher should do every one of them—some will excel in a particular task while most juggle with all of them as best they can.

The roles any one individual plays will shape their academic profile and will come to define them during their career trajectory. These roles also change over time as individuals acquire experience and seniority.

There is increasing evidence that researchers tend to specialise on specific tasks during their career, which makes collaboration more efficient. This specialisation can come at a cost, however, especially when funding agencies consider authors' contribution to publications based on their position in the order of authors. First or last authors are often given preference, which has knock-on effects on the career prospects of authors in middle positions performing tasks which are crucial to the overall work.

Career handicap

In a recent study, we observed that the tasks individual researchers performed over time seemed to affect their productivity, their citation impact, and more importantly, their career length. We identified three archetypes of scientists—'leader', 'specialist' and 'supporting'—based on the type of contributions they tend to make in research studies.

Leaders design studies and write papers; specialists are in charge of performing experiments but also may play a role study design, data analysis and writing; and supporting authors conduct more marginal contributions to papers.

Leaders can more easily shift to specialist or supporting roles and also have a greater chance at making it to the next stage in their career. While we did not explore causality, we found that the specialists tended to underperform in terms of productivity and impact, compared to their colleagues, and had less favourable positions in the order of authors on any resulting publications. This was especially true in early to mid-career stages which can be critical for career prospects.

Importantly, we also found that women scientists were more likely than men to have specialist profiles at early-career stages, which may help explain the persistent gender gap in science.

The fact that such specialist roles are evidently necessary for scientific progress reveals the need to promote and raise awareness of their importance by those researchers in a more settled position. In this sense, senior scientists need to think not only about the immediate performance of their junior colleagues, but also on how they can ensure their career development.

Motivated by mission

Of course, researchers do much more than publishing papers, and academic work is a rich tapestry that includes teaching, social outreach, knowledge transfer, commercialisation, and many other tasks. While narrow publication and citation-based metrics might be expected to cause researchers to neglect activities which are not rewarded in research evaluation, we found that undervalued tasks were still being done, but at the risk of endangering the career prospects of the researchers doing them.

In a still ongoing study, we are analysing the profile of researchers at five different departments in three different fields. Within the departments, all or most of the researchers report their publication record but the rest of activities vary greatly both within and between departments. Why are researchers spending their time on activities that are not, in principle, required?

To answer this, we interviewed some of these researchers. One of them, a physicist, said they were heavily involved in social outreach because they considered it an essential part of their job.

"It's not that we are doing what we do for the other 10 percent of people on the planet who understand what we are really doing—we are trying to do this to build knowledge for everyone."

Another researcher who produces open software and codes said they were also motivated by the sharing of information, but that publishing software is not yet considered to be as worthwhile as other academic publishing.

"I think the trade of it, in terms of scientific progress or academic progress, is still negative—it's not valued highly."

Researchers continue to carry out activities that do not benefit them personally and may even have a negative impact on their career prospects, because of their belief in and passion for their work. Funding bodies and other organisations carrying out research evaluation should start paying more attention to them.