A Renaissance for Polymaths

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Abstract

In contrast to clinical medicine, there is little place for generalism in research. Rather, super specialism is lauded, and researchers tend to work in discipline siloes; encouraged to form cross-disciplinary collaborations, but without the structures and skills to do so. Research specialists, unlike clinical specialists, are not balanced by a workforce of polymaths who can assimilate diverse perspectives, take broad views, and communicate easily across disciplines. The higher someone progresses in an academic field, the more restricted their

field of knowledge usually becomes. However, this research super-specialism has huge disadvantages for the public's health. Solutions to the most pressing health problems require complex knowledge synthesis and compelling communication. Addressing today's diverse and multifactorial health problems requires researchers who can communicate with specialists, bring ideas together and come up with new concepts and interventions that stretch across the boundaries of traditional fields of work. Universities and funding organisations need to value this type of researcher, both in their assessment criteria and distribution of funds. Without research generalists, solutions to the most complex and important health problems will stay beyond our reach. Research polymaths offer a way forward towards helping solve the complex challenges we face to secure a healthy future.

In medicine, the generalist is the most common, and central, profession. Generalists are uniquely positioned to provide a comprehensive perspective, and to coordinate care for the most complex and demanding problems. Their skill is in knowing enough about everything, while keeping the central purpose and humanity of care at the heart of their work. Their importance in an ever more complex world of medicine is clear.[1] By contrast, generalists, or polymaths, in research and academia are rare. With increasing volumes and complexity of data and information, the sphere of specialism narrows, and the academic ivory tower grows higher and more remote from the needs and complexities of health research. The accepted narrative is that academic specialists define the cutting edge of research. Research funders generally favour supporting established world experts in their field, despite the narrowness of that field. This results in research echo chambers, where increasingly technologically sophisticated methods are applied to ever more refined questions, resulting in limited human benefit. The current model for addressing complex problems places specialists together in a multi-disciplinary approach to combat siloed thinking. Boundaries are built up and then encouraged to be knocked down. But this is not always possible. We argue that research generalists should sit at the centre of efforts to address complex problems.

Historically, scientific leaders worked in many different subjects. They switched from one area to another and applied their wealth of knowledge to all. Leonardo da Vinci is probably the best-known example of such a polymath, using art in his science and science in his art. Science and art may have advanced too far for any one individual to contribute as broadly but there is scope for academics who are experts in breadth; who know about many subjects but who may not know all the intricacies. There are two main advantages to this approach. Firstly, polymaths are usually good communicators. Specialist fields of work have their own lexicons of terminology and epistemologies that often exclude others. To get past this barrier requires sufficient understanding of a subject, sometimes just to participate in discussions. This is particularly important in leadership roles and in business. Chief Executive Officers of large successful corporations have long understood this. Particularly with complex problems, the polymaths connect better with the whole team enabling interactions and, as informed

communicators, are also probably the ones best placed to engage with the public and policy makers. For example, in a study of UK and Irish pharmaceutical firms, Kelly et al found that the generalists had a better understanding of different disciplines and were best able to communicate effectively across them. This enabled them to solve more complex problems.[2] Secondly, with a broad perspective, and enough depth of understanding, generalists can approach a subject from alternative angles, bringing new ideas, applying knowledge from one area to another and taking a fresh approach to the big picture that helps prevent the tendency towards the status quo, or lack of novelty in research methods. This is the policy taken by Google. As described by their former head of human resources, Laslo Bock, “by far the least important thing we screen for is whether someone actually knows anything about the job they are taking on. To get to fresh thinking, you need a more general background.”[3] Despite this, generalists tend to be undervalued. It is normal for a generalist to ask advice from a specialist, but how often do specialists think to ask a generalist for advice? Specialists risk seeing the world through one lens, and risk losing perspective, whereas polymaths can reframe an issue or problem in a way a specialist might not naturally do so. The need for polymaths is best displayed in the complex public health problems that we face that require systems thinking, for example in relation to obesity, migration, antimicrobial resistance and climate change.[4] This mismatch between scientific endeavour and health benefit, particularly regarding complex problems, prompted the European Commission to convene a Scientific Panel for Health, under the Horizon 2020 Framework Programme for Research and Innovation.[5] The Panel recommended a set of principles to support the best research to create value in a knowledge-based society, including creative and innovative research generating big ideas through collaborative and trans-disciplinary research. Importantly, the panel recognised that a next-generation workforce will be needed, skilled in new research strategies and able to implement and evaluate innovative health solutions. The panel concluded that innovation is most successful at the intersection of fields. They cautioned, however, that inter-disciplinary and cross-border working have particular challenges, including different and sometimes conflicting goals, expectations, and definitions

of success. The key to compromise, the panel state, is open and clear communication and common terminologies and goals. Research generalists are ideally suited to lead creative inter-disciplinary research to address the most complex health and care challenges.

The increasing calls for multi-disciplinary working is not adequate. To answer difficult, multifaceted problems requires polymaths working at the heart of a multidisciplinary team of specialists. What needs to happen to develop such teams? Firstly, university deans and funding organisations need to appreciate the advantages that generalists bring. This should be represented at an individual level in indicators of quality and career progression that value breadth of knowledge. Diverse fields of work must be viewed as an advantage, not a lack of focus. These assessments should be mirrored at an institutional level for universities, whereby the proportion of academics who can demonstrate breadth of knowledge is measured. Secondly, training must be wide-ranging as well as deep. Admission criteria for students should not promote a narrow selection of subjects. And thirdly, funders need to value diversity and appreciate that sometimes someone without specialist knowledge can deliver better outcomes. This may be the most difficult hurdle as it requires a leap of faith but, if the right training and indicators of knowledge diversity can be put in place, the right people with a breadth of excellence can be identified.

In summary, diversifying the skills of the academic workforce is needed in the modern world. Polymaths may have the advantage of working imaginatively across disciplines, creating meaningful collaborations and bringing new insights, and are essential if we are to tackle complex health problems.

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