Trends Talk

Teamwork, Soft Skills, and Research Training

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We provide a list of soft skills that are important for collaboration and teamwork, based on our own experience and from an opinion survey of team leaders. Each skill can be learned to some extent. We also outline workable short courses for graduate schools to strengthen teamwork and collaboration skills among research students.

About Soft Skills in Scientific Collaboration

Teamwork and collaboration are expected from scientists. Recently, an increasing number of voices have been asking for explicit training in 'soft skills' for university graduates [1–4] to prepare them for careers both in academia and outside. However, what soft skills are most valued by scientists and by recruiters? Are some soft skills more important than others for research collaboration? Are they in fact learnable? How might a postgraduate program be set up to inculcate them?

Published studies about scientific collaboration are mainly statistics of authorship pattern [5,6], case studies and individual testimony [7–9], or material for self-training mainly about leadership (e.g., how to set up your own lab? [10]) or tricks for tackling teamwork [8,11] (e.g., writing 'prenuptial' agreements, handling conflict etc.). Here, we consider which soft skills are ranked highest by research team leaders, and how relevant training might be delivered to early-career scientists. What we offer is based on two main sources of evidence. We have been running short courses for postgraduates and postdocs within our Genes to Geoscience Research Enrichment Program. We have refined these courses through discussion and reflection over several years. We have also surveyed opinion among leaders of research labs.

The Set of Soft Skills that Makes A Good Scientific Collaborator

As well as being scientifically competent, good research collaborators need to be able to work with others towards common goals, such as project objectives, publishing articles, and graduating students. Our current list of 14 soft skills that contribute to scientific collaboration or teamwork is provided in Table 1. It began from a list of

Table 1. List of Soft Skills as They Were Presented to Research Leaders in the Survey Described in the Main Text and in Figure 1[a]

Soft Skill	Description
Building external working relationships ('Networking' in Figure 1)	'Establish and maintain positive relationships with people beyond your own team, forge links with other teams, forge useful partnerships with people across other organizations and countries'
Cultural and diversity awareness	'Appreciate team diversity (career stage, language, culture, gender), communicate well with diverse people, see issues from the perspective of others, show respect for values of others'
Emotional intelligence	'Actively create a pleasant human environment for work, show empathy, accountability, humility, friendliness, unselfishness'
Inspiring moral trust	'Value trust and loyalty within the team, share information, treat all individuals fairly, act with integrity, keep your word, meet deadlines and fulfill expectations'
Inspiring competence-based trust	'Inspire confidence in your capacities and skills, be able to explain and underline your competences and their value to others'
Strategic thinking	'Think at a big picture level, take a long-term view, entertain wide-ranging possibilities in developing a vision for the future'
Elicit emotional engagement	'Inspire a strong desire to succeed among team members; steer others towards successful goal and task accomplishment'
Empower talents of others	'Ask questions that bring the best from others, actively improve skills and talents of others via constructive feedback, empower others with authority and latitude to accomplish tasks effectively'
Initiative	'Proactive and self-starting; seize opportunities and act upon them; originate action and actively influence events'
Decision-making	'Make quick decisions when required; commit to definite courses of action; make rational and sound decisions based on a consideration of the facts and alternatives available'
Conflict resolution	'Promote harmony and consensus through diplomatic handling of disagreements'
Persuasion	'Gain agreement to proposals and ideas; stand ground in the face of opposition; negotiate skillfully'
Resilience	'Respond effectively to disappointments and setbacks; remain calm and in control even under pressure; receive criticism in a constructive manner rather than becoming defensive'
Flexibility	'Be adaptable and receptive to new ideas; respond and adjust easily to changing work demands and circumstances; not bound by old ways of doing things'

[a]Other suggestions that have come forward after people have seen this list include 'listening', 'being reasonable', and 'actively understanding other disciplines'. We warmly agree that listening and being reasonable are important. However, we would regard them not so much as separate skills, rather as embedded within skills listed above.

skills targeted during recruiting processes by a large government science agency. It has been refined and rephrased over time through discussion with colleagues, short-courses with postgraduates, and our own reflection. Some skills seen as critical to sustain collaboration [7,9,11] have also been added. Others, such as 'written communication' or 'project management', have been removed, being at a tangent to teamwork.

We believe that the list in Table 1 is now a good one, meaning that each skill is important, is clearly described, and is sufficiently distinct from the others. When we gathered opinion from research team leaders worldwide (Figure 1), each of the skills listed was seen as always or often important by most of the 46 respondents. Few suggestions came forward for further skills to be added, and preference among them was quite balanced (no single skill was ranked top by more than 20% of team leaders).

Soft Skills and Job Interviews

Most of the team leaders whom we surveyed believed that soft skills could be assessed in candidates during interviews (Figure 1). Other colleagues have expressed the same view to us. We have heard varying opinions about how much such assessments arise from general

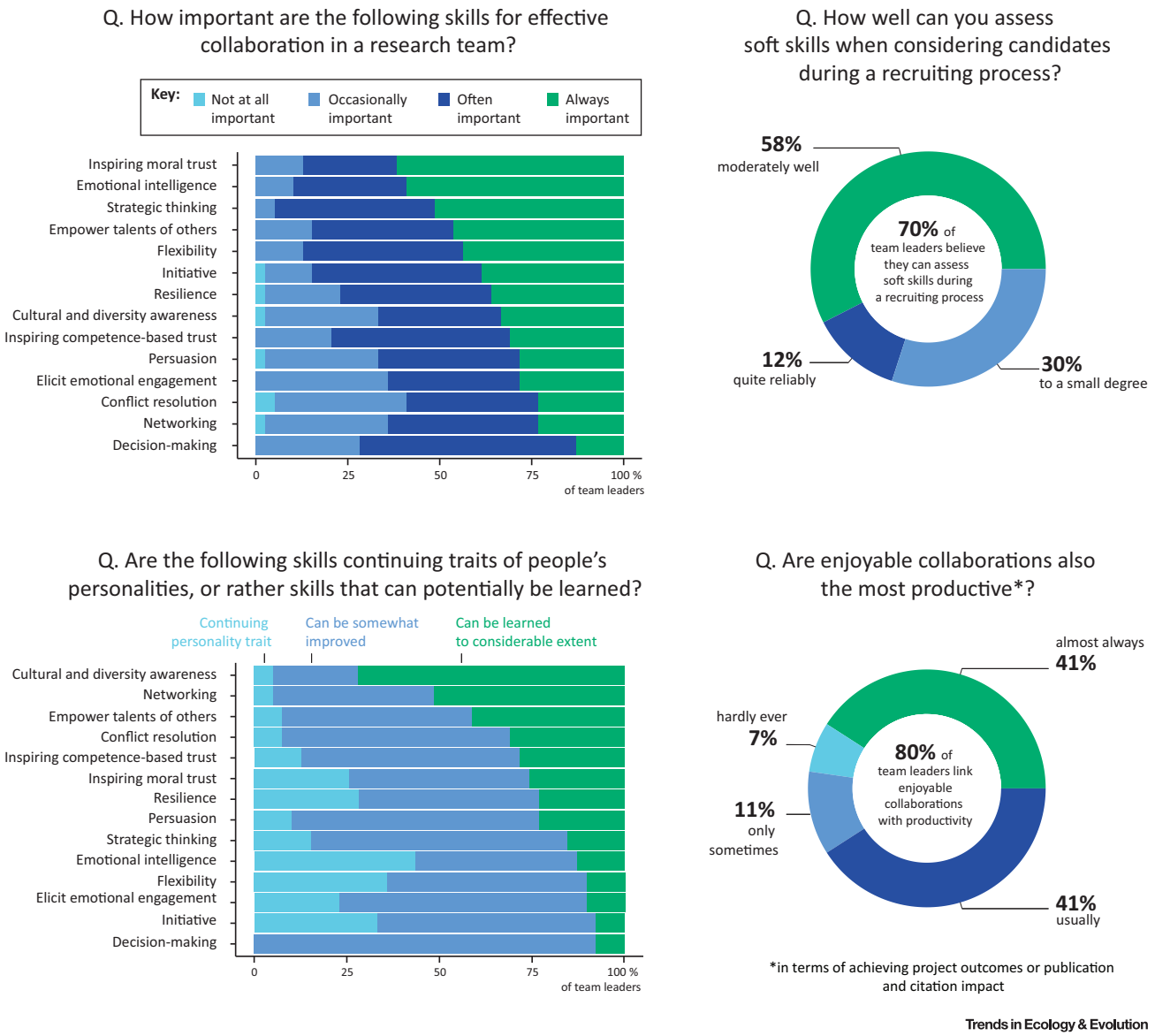

Figure 1. Overview of Opinion on Soft Skills from Influential Research Team Leaders. The top 235 people from a highly cited list (http://thomsonreuters.com/en/articles/2014/worlds-most-influential-scientific-minds-2014.html, inspected May 2015) in Ecology and Environment were approached during July 2015, and 46 of them responded. Their responses are summarized here to four of the questions asked.

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