Judging Academics

Evaluating the work of researchers and teachers is not an easy task. It is probably easier to assess the performance of investment bankers and marketing managers, although I suspect there are many other professions where evaluation may be a difficult exercise. Academic institutions, universities and research laboratories need to periodically assess performance of individuals and departments, if improvements are to be effected. In these days of ‘world rankings’, Indian institutions cannot afford to be totally left out or appear to slide down the charts in the face of global competition. Assessments, evaluations and the rate of success of new recruits, both faculty and students, in establishing themselves in productive niches, are therefore legitimate concerns of those responsible for administering academic institutions. I was therefore very attentive when a young, ambitious and articulate colleague argued that the emphasis on research publications, as an index of academic success, was misplaced. He advanced the view that it was important to also consider the contributions that individuals (and, by implication, institutions) make to ‘human resource development (HRD)’. My interroga-
tor asked me pointedly: ‘Do you consider the creation of human resource as an important parameter in the academic assessment of faculty?’ I have never been comfortable with the abbreviation HRD or its expansion; this is a phrase that has replaced a simple word, that was common in simpler times – ‘education’. However, both government and the corporate world believe that it is an apt de-
scriptor for activities, which train people to be useful and productively employed. HR (human resource) man-
gers seem to be important functionaries in every major corporation, but are unknown in academia. In thinking about my colleague’s poser, I came to the conclusion that he was referring to teaching in all its forms; in the con-
tventional classroom, as well as in the laboratories, where students learn the practice of research. A few days later, I was in the audience when C. N. R. Rao, one of our most illustrious scientists, reflected on a long and unmatched career. In concluding a forceful and exuberant presenta-
tion, he exhorted the young and aspiring researchers, who had assembled in large numbers, to be ‘unafraid of publi-
ishing’. His argument was compelling; quality and quan-
tity of academic output must go hand in hand if Indian research was to keep pace with the increasingly com-
petitive world of global science. This was a message which seemed to be clear and unambiguous; one which I could confidently endorse, both as a scientist and as an admin-
istrator. But, listening, as I have been to divergent views, two questions seemed to loom large. First, what does it take to be ‘successful’ in science? Second, how can institutions judge the performance of researchers and teachers?

A career in academia can be most enjoyable and fulfill-
ing, low salaries notwithstanding. Academic scientists choose their own problems and follow their own inclina-
tions, jealously guarding their freedom and independence. But academic careers can follow a treacherous path, es-
pecially in the early years. A Ph D is the passport to a life in research. Choosing disciplines and mentors (‘guides’, a term which somehow always reminds me of R. K. Nar-
ayan’s famous novel) can be decisive in shaping careers. The craft of research is best learnt by apprenticeship. The ability, to make judgements about scientific problems and approaches to studying them, is effectively acquired by closely watching the more experienced and successful practitioners of the craft. The postdoctoral period allows a glimpse of the increasingly common world of team ef-
fort; it is a time when the skills of collaboration are often learnt. The hardest period is undoubtedly at the start of an independent career, when problems have to be chosen and the difficult lessons of mentoring have to be mastered. In most fields, new faculty members at any of In-
dia’s major institutions are able to quickly attract students willing to register for research degrees. The immediate task then is to choose the right research problems to ad-
dress. This is often difficult for young researchers returning to India after long stints in large groups in Western laboratories, which function like well-oiled research ma-
chines. Imported problems rarely take deep root in local soil. The absence of technical support to operate and maintain sophisticated equipment is a sudden impediment that confronts researchers, who are used to efficiently run ‘core facilities’. In fields like biology and chemistry, the need to routinely use expensive and complex equipment is acutely felt; technical innocence can be a crippling handicap. For the ‘inbred’ researcher, in our institutions (and inbreeding is a common practice) there is a regre-
table tendency to continue with problems and areas investi-
gated for a doctoral thesis. Succumbing to this temptation is clearly an invitation to bury a research career even be-
fore it has begun. Choosing a problem that is topical and addressable is a challenge that must be faced. Reading the literature, listening (and listening carefully) to seminars...
and taking an interest in problems being tackled in the
surroundings is a pragmatic way of feeling one’s way
through new areas of research. Chasing after ever chang-
ing fashions in research can turn out to be an unreward-
ing exercise, in the Indian environment. Peter Medawar in
Advice to a Young Scientist (Harper and Row, New York,
1979) offers a cautionary note: ‘It is one thing to fall into
step with a great concerted movement of thought such as
molecular genetics or cellular immunology, but quite an-
other to fall in with prevailing fashion, for say, some new
histochemical procedure or technical gimmick’ (p. 15).

How long must research problems be pursued if no re-
sults of note are forthcoming? This is a question which is
difficult to answer in a precise fashion. The history of
science is replete with examples where great success has
been achieved after a long period of drought. Relentless
pursuit of a problem by an obsessed and determined re-
searcher can yield a solution after considerable periods
of time. But, in today’s world there is little sympathy for
long, unproductive periods in a researcher’s life. Results,
publishable and visible, are important. It is therefore
critical for researchers, especially in the early phases of
their careers, to judge how long they will plough an un-
yielding field. Most often, it is intellectually satisfying to
pursue what is sometimes called ‘hypothesis-driven re-
search’, as opposed to the simple minded approach to science,
which Ernest Rutherford famously labelled as ‘stamp col-
lecting’. It is not uncommon to see researchers driving
their students to find experimental support for a pet hy-
othesis. When this is not forthcoming a very difficult
situation can develop; many mentor–student relationships
have floundered when pet hypotheses resist experimental
verification. Medawar proffers sage counsel: ‘I cannot
give any scientist of any age better advice than this: the
intensity of conviction that a hypothesis is true has no
bearing on whether it is true or not’ (p. 39). The irrational
desire to provide an experimental test of a flawed hy-
othesis can be dangerous; overly optimistic interpretations
of results can lead to researchers deceiving themselves.
Medawar has a sombre thought: ‘A scientist who habitu-
ally deceives himself is well on the way toward deceiving
others’ (p. 39).

For researchers at the start of an independent career,
there is a sudden transformation in role; the apprentice is
expected to blossom into a teacher. The twin responsibil-
ities of classroom teaching and mentoring students in lab-
atories can seem formidable in the early years. Teachers
acquire a degree of competence in classroom lecturing,
with practice. Building a viable research group is a key
ingredient for success in most areas of science. There are
very few research problems today that can be successfully
tackled by lone researcher. The difficulties of group ac-
tivities quickly become apparent, as individuals vary
greatly in their personality traits, their intellectual and
experimental abilities and in their commitment to work.
Students (and senior researchers) can be energetic and
aggressive, passive and introverted, ambitious and cun-
ning, enthusiastic and childish. The selection procedures
at the best of our institutions are intended to ensure a
basal level of academic ability. They rarely test motivation
and commitment. The task before institutions and men-
tors is to mould the new entrants into competent and pro-
ductive researchers. It is this activity that my colleague
seemed to be referring to when he used the term ‘deve-
lopment of human resources’. Most young members of
the faculty develop passable skills at mentoring, but few
will disagree that mentoring can, at times, be a difficult
task. The pressures of research and the drive to be success-
ful can often make senior researchers view students as a
‘resource’, with which their personal career goals are ad-
vanced. In these situations the student can acquire a number
of technical skills, but may be slow to mature into an in-
dependent scientist, with a broad view of the discipline.
Mentoring, like parenting, can be both pleasurable and
stressful. Patience and good humour are characteristics of
successful mentors. The best teachers are those who like
to have students around them always; age is never a barrier
in this relationship. Teachers can be intellectually refres-
shed as each new generation of students stimulates a re-
newal of the mentor’s commitment to scientific research.
The inability to act as a mentor can destroy scientific ca-
reers, as research productivity, most often, depends on
the work of students. There is one important difference
between conventional teaching and mentoring in a re-
search environment. The damage that can be done by a
poor lecturer in the classroom is limited. Far greater dam-
age can be inflicted in a research laboratory.

I must return to my original concerns. Are publica-
tions the only parameter for assessing faculty performance
in our research institutions? I cannot really think of a sim-
pler and more reliable metric of measuring scientific out-
put. Assessments of what constitutes acceptable quantity
and quality necessarily vary across fields. Comparisons
are always more reliable when restricted to well defined
areas. We must also remember that PhD research that
does not eventually get published, makes most serious
academics uncomfortable. For work from India to have
significant impact and to be noticed, both quality and
quantity are essential. Mentoring is another activity that
merits credit. The primary purpose of research institutions
is to provide a launching pad for academic research and
to produce successive generations of trained researchers.
In emphasizing the role of ‘creative mentoring’, the jour-
nal Nature has introduced a new award, ‘created on the
premise that the mentorship of young researchers –
although fully deserving of recognition – is perhaps the
least remarked on of all the activities that take place in
the lab’ (Lee, A., Dennis, C. and Campbell, P., Nature,
2007, 447, 791). After a survey of the attributes of good
mentors, the authors conclude: ‘Having a good mentor
early in one’s career can mean the difference between
success and failure in any career’. Even more impor-
tantly, they note: ‘Those who are good mentors get incal-
culably more out of it than they put into it’.

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