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# WHY DO WE STILL NOT APPLY WHAT WE KNOW ABOUT MANAGING R&D PERSONNEL?

Recently, I was asked to present a paper at a conference of the Analytical Laboratory Managers Association (ALMA) on the "Management and Leadership of Scientists" (1). I initially decided to focus on three themes: what is unique about being a manager in a science-based organization, what are the prime motivators of R&D staff, and what are the characteristics and actions of an effective leader of scientists?

Midway through my preparation, I realized that most of the information contained in these themes was not new, leading me to add a fourth theme, "Why are we still not applying what we know?"

Some of the unique features of an R&D environment that affect the ability of a manager to manage researchers properly that I decided to include were (2):

- The uncertainty associated with R&D activities.
- The difficulty of assessing the contribution or impact of research results on the firm or on the advancement of science/technology in general.
- The rapid changes in science and technology that result in an ongoing battle to stave off technological obsolescence in both people and equipment.
- The values, expectations and attitudes of research scientists and engineers are in many aspects different from those of other professionals.

I went on to provide an overview of the more popular theories of motivation and their application to the R&D

environment. These included Maslow's Needs Hierarchy (3), Herzberg's Motivation-Maintenance Theory (4), McClelland's Socially Developed Needs (5), the Goal Setting Theory of Motivation (6), and Vroom's Expectancy Theory of Motivation (7). These theories can be summed up as follows: Scientific staff are highly motivated and experience high levels of job satisfaction when they are allowed to satisfy their psychological needs for:

- Experiencing achievement.
- Receiving respect and recognition from peers and colleagues both inside and outside their organization.
- Being self-fulfilled.
- Having opportunities for professional growth or organizational advancement through working on R&D projects of a challenging, important and/or interesting nature, for which they are held responsible for the conduct of the work, and that have clearly defined goals and objectives.

I then outlined how an effective R&D leader could put these theories into practice, keeping in mind that everyone is different and that the key to effective management is to treat people as individuals. This included a description of some of the key attributes of a good R&D leader, such as the ability to operate in a participatory/consultative style when making decisions, to inspire enthusiasm for the goals and objectives of the organization, to listen carefully in order to understand accurately what people are trying to say, and to be honest and forthright in their dealings with colleagues and subordinates. Among the specific motivating actions I described were:

- Allowing scientists the freedom and autonomy to make operational decisions about their work.
- Providing challenging, interesting research projects.
- Reinforcing the importance of the work the researchers are doing.
- Providing adequate resources in terms of money, equipment, people, and time.

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- Encouraging researchers to take risks and try something new (i.e., reducing the "terror quotient" in the organization).
- Ensuring a fair, equitable and responsive reward and recognition system that emphasizes intrinsic over extrinsic rewards.
- Encouraging interaction between the organization's researchers and those in other research organizations.

### Nothing New

As noted earlier, I realized that none of this information was new. The fact is, we have known how to lead/manage R&D personnel for about 50 years. This knowledge has been available ever since the *IEEE Transactions on Engineering Management* started publication in 1953 and *Research Management* in 1958. Why then is the application of this knowledge to the management and leadership of research scientists still a problem?

Is it that these motivation theories and descriptions of the actions and behaviors of effective R&D leaders are out-of-date and are no longer a useful guide for managers? Definitely not! I recently surveyed researchers attending my R&D management workshops and asked them to list the characteristics and behaviors of the best R&D manager they ever had, the individual who had encouraged their best performance.

Their list of the characteristics and actions of their "best" manager included (motivational theory base):

- Had trust and confidence in their ability (Expectancy Theory).
- Was a good planner and used a consensus approach (Participative leadership style).
- Allowed them autonomy in determining their research approach (Participative leadership style, Maslow, Herzberg).
- Facilitated networking (Maslow, Herzberg, McClelland).
- Acknowledged and rewarded accomplishment (Maslow, Herzberg, McClelland, Expectancy Theory).
- Encouraged risk taking and creativity (Maslow, Expectancy Theory).
- Supported team in dealings with senior management (Maslow, Herzberg, McClelland).
- Was honest and approachable.
- Reinforced the importance of their work (Maslow, Herzberg, McClelland).
- Was a good two-way communicator.

# Selection of R&D managers is still biased too much in favor of the best scientific/technical skills.

### Why the Gap?

My survey clearly shows that the basics of managing and leading scientists that we have known for many years are still valid. Why then is there still a gap between knowledge and application?

I believe there are three fundamental reasons for this shortfall.

1. The criteria used to select potential R&D managers are still biased too much in favor of the person with the best scientific/technical skills rather than the person who has good scientific/technical skills and also the ability to learn and apply management knowledge and skills.

This can and does result in selecting researchers who believe there is nothing they need to learn about managing other scientific staff. This arrogance is best illustrated by the R&D manager in a large government agency who, when requested by his senior management that he should go on management training, replied, "Management training? Why do I need to go on management training? I have a Ph.D. in physics."

2. Even when potentially good R&D managers are selected, many organizations still have the bad practice of moving them into management positions without any training in R&D management.

These newly appointed R&D managers know absolutely nothing of the vast body of knowledge and information that has been accumulated over the past 50 years on the proper management of R&D personnel or the broader area of the management of the technological innovation process. Compounding this problem is the misguided belief by human resource managers that general management training is adequate for R&D managers. It is not! General management training does not take into account the unique aspects of leading scientists in an R&D environment and the problems many scientists have when moving from the "bench."

Universities could alleviate this problem somewhat by incorporating in their graduate science and engineering programs at least one compulsory course on the management and leadership of scientific/technical personnel. As an intrinsic part of the overall training of future research scientists and engineers, the course would familiarize the students with the basics of R&D management and bring to their attention the body of knowledge that exists on management and leadership of scientists that they could draw upon later in their careers. It would also sensitize them to the need to take further training in the broader area of management of the technological innovation process, in the event that their career aspirations change from being a scientific/engineering contributor to being an R&D manager. Programs on the management of technological innovation are offered by a number of universities as executive education programs and/or graduate level programs (e.g., Northwestern University, MIT, Manchester (UK), and Simon Fraser University in Burnaby, B.C., Canada.

3. Another contributing factor to the lack of application of what we know about effective R&D management has been the steady decline in the number of articles written by practicing R&D managers in R&D management journals.

For example, articles by R&D managers about how they deal with difficult-to-manage scientists are a rarity. With the exception of a few R&D management journals, *Research • Technology Management* being one, many of the articles are written by academics trying to impress other academics. The information contained in such articles is of little practical use to R&D managers.

It has been disheartening to watch some previously useful journals become so esoteric and theoretical that a

Ph.D. in management is required to decipher their articles. So, while more R&D management journals are being published today, the overall body of information that can be put into immediate practice by R&D managers is not expanding.

In summary, to improve the overall management and leadership of scientific staff, selection and training of prospective R&D managers must be improved, universities should incorporate at least one compulsory R&D management course dealing with the management and leadership of scientists and engineers in their science, and engineering graduate program curricula, and R&D management journal editors should devote more space to articles that provide practical information for R&D managers. ☺

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#### References

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