

'Whom are we fooling in research?'—an experience in brainstorming

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A group of industrial researchers search for identity.

The scene of Indian scientific research has undergone many changes over the years. At the turn of the century and in the early years of independence, the scientific infrastructure available in the country was applied to assimilating imported technologies and adapting them to the country's needs. To make the country self-reliant, research needs in strategic areas (defence, atomic energy, space) and other, socially demanding areas (agriculture, medicine, heavy engineering, etc.) were identified and basic scientific investigations were initiated. The importance of industrial research was realized during the formative period of the country's scientific base. Many national research institutes and in-house industrial research activities were initiated to resolve technical problems of industry and develop new technologies. The contribution of such applied research to the country's economy is well recognized now. Today, we are in a position to develop our own technologies and offer them to other countries against stiff international competition. Inadvertently, industrial research output is interpreted as routine scientific application, and comparison is attempted between research carried out in industrial research centres and academic/national institutes. Such comparison leads to a desire for role clarification in the industrial researcher. Here we, a group of industrial researchers, discuss the outcome of a brainstorming exercise on a topic related to our profession.

The background to the brainstorming exercise is as follows: The group of industrial scientists was exposed to a new vista of learning through a 'Dream and creativity' workshop. The theme of

the workshop centred around the exploration of creative aspects of the subconscious mind, and the techniques involved were brainstorming, lateral thinking and dream analysis. After the programme, the participants felt the need of continuing their interaction to learn more about creativity. They subsequently formed a 'Dream Club', and pursue activities like dream analysis, brainstorming and social gatherings. The purpose of these meetings is

- to enhance an individual's creativity by identifying his/her mental blocks through collective dream-work and brainstorming,
- to create general awareness by arranging discussions on topics of common interest, and
- to bring about togetherness among members through various informal activities.

The club was named Swapnodaya (SWAP for short). The synthesis of the name itself was the outcome of brainstorming. At one such brainstorming session, the group was posed with the question, 'Whom are we fooling in research?' The poser kindled the innermost feelings of the members, urging them to seek answers to questions like: Were they doing justice to the society/nation, and, more important, to themselves, through their profession (i.e. research)?

Brainstorming methodology

The exercise of brainstorming is designed to seek and analyse spontaneous viewpoints/ideas/feelings of a group of persons on a particular topic and arrive at meaningful conclusions. The metho-

dology adopted in the present case was as follows: There were twenty participants in all the sessions (12 in number, each of one hour duration). Apart from the topic 'Whom are we fooling in research?', no specific clues or directions were given to the participants. One of the members was chosen as the leader who would conduct the sessions, and all the sessions were conducted by the same person to maintain uniformity in the style of performance. The leader was entrusted with the job of evolving spontaneous responses from members, allowing discussions judiciously, and summarizing the responses in the form of keywords that conveyed the group's feelings. The sessions were conducted in a free, frank and encouraging atmosphere, and all the spontaneous responses were recorded on a blackboard. The responses were retained in their original form or rephrased to convey their abstract meanings. In most of the cases, only one response was accepted from an individual on a particular topic of discussion. For the sake of convenience in analysis, responses were classified as 'positive' or 'negative'. However, no attempt was made to quantify the responses, since it was felt that such an attempt might hamper the free and natural responding process. Often the sessions turned into discussions, which were allowed in order to gather the complete views of the participants.

Analysis of responses

The responses to the question 'How are we fooling/not fooling in research?' are listed in Table 1. The positive responses are meant to convey feelings of 'not fooling', i.e. the situation is professionally agreeable or the individual is satisfied with the situation. The negative responses indicate the feelings 'fooling', which means the person is not professionally agreeing but is compromising with the situation. Keywords were

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picked up from both types of responses and are also listed in Table 1. A critical examination of the responses shows that the majority of them are negative, implying that the participants have a feeling that they are 'fooling in research'. Detrimental factors like absence of selfless leadership, pursuit of goalless research, research only for survival, personal gains/recognition at all costs, etc. are perhaps responsible for such a feeling. The feelings behind the evolution of these keywords were debated upon and it was seen that they converge to form a set of principles that constitute the group's perception of research (Table 2).

A significant point that emerged during discussions is 'If the group has a clear perception about research, why do most of them still have a feeling of fooling in research?' It was decided that each of the principles be scrutinized and the reasons for the mismatch between the group's perception and its feelings be found. The participants found it easier to respond if the questions were posed to them rather than elaborate on keywords. Hence the leader, with the help of the participants, converted the keywords (or the perceptions) into questions. Each point was selected and reframed into a suitable poser that was sharp enough to generate responses in a brainstorming session (Table 3). The following section contains the responses to each of these posers, analysis of the responses, and conclusions.

Discussions

Are we committed/sincere towards research?

The responses, listed in Table 4, fall into both positive and negative categories. Responses like commitment to self-achievement, increase in social status, gaining self-recognition, etc. reflect the positive attitude, as there is always a natural tendency for every individual to seek recognition or achievement. These positive tendencies, resulting in healthy competition, may ultimately contribute to betterment of the surroundings. Responses such as committed to exploit others' ignorance, manipulations, not doing work, etc., which reflect an attitude that is likely to vitiate the environment, are therefore classified as negative ones. Fortunately, the responses showing such an attitude are fewer

Table 1. Responses to 'Research—how are we not fooling/fooling?'

- How are we not fooling? (Positive responses)
1. We are doing our job, work, self-satisfied
 2. Efforts to fulfil the social obligations through research with sincerity
 3. No misinformation/wrong information
 4. Effective utilization of education/experience
 5. Best opportunity for applied research
 6. Contribution towards country's growth
 7. Professional achievements
 8. Less investments, more returns

Keywords: Sincerity, social obligations, country's growth, effective utilization of experience and education, professional achievements, investment returns, correct information, self-satisfaction

How are we fooling? (Negative responses)

1. Lack of commitments
2. No returns over investments
3. No real gain analysis
4. Show business
5. Incomplete/wrong information
6. Lack of direction
7. Perpetuating an inefficient system
8. Lack of truthfulness
9. Self gains at all costs
10. Following easy ways
11. Selfish leadership
12. Lack of standards
13. Copying research/lack of originality
14. No goals
15. Under-utilization of capabilities

Keywords: Lack of commitment, selfish, lack of directions/goals, improper utilization of experience and education, lack of high standards, no gain analysis, lack of truthfulness, lack of originality.

compared to those reflecting a positive attitude. Detailed discussion on these attitudes resulted in identification of the factors that cause them. The positive attitudes have been classified into three categories, viz. motivators, security and sense of service. The negative attitudes are identified as exploitation, selfishness and deception. They lead to the conclusion that the members seek security, sense of service and recognition. The responses revealing their commitment to such topics means that in reality the individuals are preoccupied with related thoughts. This might be due to the wish for recognition in some cases or the lack of appreciation from higher authorities in others. There is a clear message indicating the necessity of improving one's commitment towards research and improving sense of service among researchers. The need of an atmosphere of motivation and security in the job is also reflected. The negative attitudes reflect the fears that scientists hold. It is

Table 2. Perception about research

- * High sense of commitment/sincerity
- * Social obligations
- * Truthfulness
- * Self-satisfaction/professional achievements
- * Country's growth
- * Economic aspects
- * High standards/originality

Table 3. Posers synthesized from keywords

1. Are we committed/sincere towards research?
2. Do we have high standards/originality in research?
3. Should we consider economic aspects in research?
4. Are we truthful/honest to research?
5. Has research contributed to country's growth/fulfilment of social obligations?

Table 4. Are we committed/sincere towards research?

Positive responses, committed to:

- | | |
|-------------------------------|----------------------|
| * The situation/environment | * Society |
| * Self-satisfaction | * More than expected |
| * Internal report/publication | * Self-achievement |
| | * Self-recognition |
| | * Company |

Negative responses, committed to:

- | | |
|--|--|
| * Saving neck | * Widen the gap between supervisor and nonsupervisor |
| * Popularity/social status | * Bring eight hour sweet end |
| * Engage others | * To the extent believed |
| * Next promotion | * Till next alternative |
| * Exploit company's facilities | * Boss/superboss |
| * Exploit others' ignorance | * Salary |
| * Authority gained through keeping information | |

felt that these attitudes will disappear if the positive tendencies are encouraged by improving upon the three factors identified earlier.

Do we have high standards/originality in research?

This poser helped the participants assess the standard of research work they pursue. Responses clearly show that the participants agree with the existence of high standards in research. However, it was also felt very strongly that high standards in research are not necessarily linked with professional achievements, particularly in an industrial set-up. If true, this is an alarming situation that needs immediate attention. The other two points that emerged from the discussions are: (i) there

pressure on scientists to perform jobs that may not have any scientific content, (ii) there is lack of clarity about the role of scientists, especially in industrial research organizations.

Should we consider economic aspects in research?

Responses obtained reflect the following viewpoints:

- (i) Economic analysis/accountability in research is a must.
- (ii) For certain types of research (fundamental/innovative), economics should not be the limiting factor.
- (iii) The privilege of spending funds in research must be exercised judiciously.

The last view shows the concern of the scientists towards society. This concern comes as a surprise since there are hardly any conscious and regular efforts made by scientists to carry out an economic analysis of research. Such an attitude may have come up owing to the backdrop of industry. The members of SWAP expressed unanimous concern over relating scientific activities with the money involved. It was felt that economic analysis should form a part of each project/report/patent/paper, even if it is a rough estimate. Similarly, it was felt that a realistic estimate of the economic output of research contributions would help others to appreciate the value of research, which by itself could be a motivating force for the researcher.

Are we truthful/honest to research?

Answers obtained to this poser converge to the following points:

- (i) Experimentation/data generation is honest (truthful).
- (ii) Presentation of data may involve (a) scientific bias, (b) intentional projection/suppression of observations to suit a situation.

In fact, the majority of the responses reveal that ii.b is quite prevalent. This shows that desire to seek recognition and lack of proper appreciation from higher authorities may force scientists to twist conclusions to suit the requirement of the situation. This in turn may result in deterioration of the quality of work and presentation of manipulated data.

Has research contributed to country's growth/fulfilment of social obligations?

The paucity of responses in this case may be due to

- (i) lack of awareness/appreciation of impact of research on national growth,
- (ii) absence of any sincere effort to link research with nation-building,
- (iii) research being given a low priority as far as country's immediate needs are concerned; some may even view it as a luxury.

Of the three points, the first one is more relevant. It appears that cost-benefit analysis is rarely carried out for R&D efforts. Evaluation of research output in terms of its contribution to current and future technology is not strictly performed. As a result, a sense of service towards the employer or nation through research has not been cultivated. Our earlier discussions showed that improvement in 'commitment to research' for a scientist is attainable by instilling in him a feeling of 'being useful to society'.

Conclusion

We believe that this article highlights the conflict in the minds of industrial researchers. The brainstorming exercise revealed that, in the profession of industrial research, scientists are searching for identity, most of the time, which virtually gives them a feeling of fooling themselves and society and that they are only able to manage themselves within the system.

Other observations

Industrial researchers have a perception that they are not able to do full justice to their profession. By and large, the dilemma is reflected in the type of questions that were posed for brainstorming and the responses obtained. The following messages emerge from the discussions:

- (i) Desire to get appreciation/recognition appeared to be strong throughout the discussions. This feeling is perhaps particular to researchers working in an industrial set-up. An industrial researcher works in an atmosphere different from that of an academic researcher. He/she has to face a less friendly atmosphere within the organization and often has to answer questions like 'What can R&D do for the company?'

It is difficult for him/her to convince colleagues that discoveries cannot be baled out like tons of materials in a production unit.

(ii) An industrial researcher is expected to play the dual role of a scientist and a manager. In such a situation, it is difficult to be accepted as either a mainstream scientist or a mainstream manager.

(iii) An industrial researcher in this country is conveniently compared with people working in multinational research centres located outside the country, with no consideration of the meagre resources/investments available at his/her disposal.

(iv) Whatever be the discoveries that the researchers make against all odds, often industries are hesitant to take the risk of commercial exploitation.

(v) Having chosen to work in industry, the scientist's scope of research is also limited, restricted to those areas of relevance to the company's business interests. In short, he/she has to struggle a lot to prove his/her worth compared to the others in the organization, even though in terms of inputs and work ethics he/she may be equal to the others.

(vi) All the factors mentioned earlier make the industrial researcher alienate himself/herself from the academic researcher. On several occasions, the research output of an industrial researcher is compared with that of his/her counterparts in academic institutions. The research output in academic institutions is not quantified with respect to time and money whereas industry requires accounting for both.

(vii) It appears that research in industry is a mundane job and not the enjoyable, exciting occupation it ought to be. Very few recognitions at national level are awarded to the industrial researcher, which leaves him/her in a quandary. Unfortunately in our country, industrial researchers are very few in number to have a special stream of their own. This results in an identity crisis and generates a desire for recognition. Hence proper appreciation/recognition mechanisms must be introduced.

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