

# How to evaluate and reward science and technology researchers

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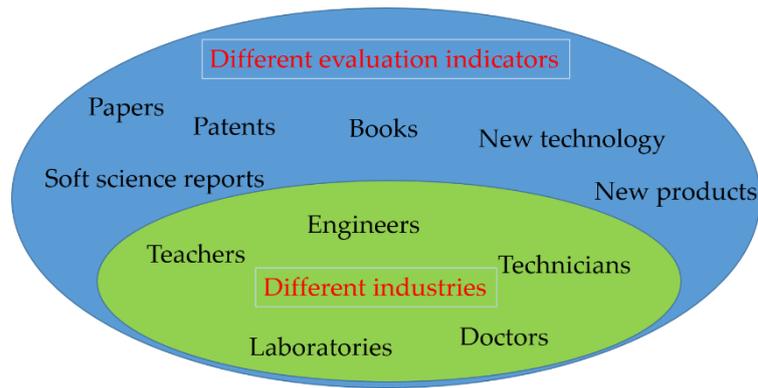
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Science and technology rewards are social incentive systems that inspire the creativity and enthusiasm of science and technology researchers and further promote the advancement of science and technology [1]. The first problem to be solved for the achievements of science and technology workers is how to scientifically and impartially evaluate the contribution of scientific and technological researchers. "The phenomenon of poor talent and inaccurate evaluation is extremely easy to dampen the enthusiasm of talents, affecting the creativity of talents, and even becoming a shackle for talent development." said by Wu, J., the former dean of the China Academy of Personnel Science [2].

According to the survey in [3], the scientific and technological researchers' recognition of the current science and technology evaluation reward system is not high, but the classification evaluation system with peer evaluation as the main body and comprehensively reflecting the professional characteristics and scientific and technological performance is full of expectations. Wang, G. in [4] pointed out that to deepen the reform of the science and technology system and establish a more complete evaluation and reward system, firstly we must improve the talent evaluation standards and change the practice of evaluating talents by papers, projects, funds, and patents; in terms of evaluation, it is necessary to focus on the quality and actual contribution of scientific and technological innovation according to the characteristics of different types of scientific and technological activities, and formulate evaluation criteria and methods with clear orientation and equal emphasis on incentives and constraints; in terms of rewards, it is necessary to reform and improve the national science and technology reward system, and establish a scientific and technological reward mechanism with public nomination, scientific appraisal, practice testing, and high credibility [4].

I am an experimental technician and graduate for the Ph.D. degree at Shandong University, thus, taking the evaluation and rewards of engineering/experimental technicians in university as an example, how to evaluate and reward them is briefly talked about as follows.

First of all, there is an old saying in China that there are 365 industries, and each industry has a champion. There is a big gap between different industries, and it is difficult to unify the results and evaluation criteria. Therefore, as shown in Figure 1, different evaluation systems should be set up according to different positions, such as teachers, engineers, laboratories, and technicians. They should be configured differently in the evaluation system consisting of papers, patents, books, new technology or products, and soft science reports, to which different proportions are assigned. For example, unlike teachers who emphasize the evaluation of representative papers, engineers and technicians emphasize the development and application of new technologies and new products, followed by patents, and then papers and works. According to the survey in [3], the proportion of the engineering/experimental technicians surveyed who valued the different evaluation indicators is shown in Table 1.



**Figure 1.** Different industries and different evaluation indicators.

**Table 1.** The proportion of the different evaluation indicators valued by engineering/experimental technicians\*.

Evaluation indicator	Proportion
new technology or products	60.7%
patents	18.7%
papers	12.5%
books	3.9%
soft science reports	1.1%

\* The data of the proportion in the table is referred to [3].

Secondly, in the evaluation standards of excellent science and technology researchers, “peer review” is the most important criterion. The higher the academic qualifications, the higher the professional titles, and the more participating activities in the research and development (R&D), the higher the emphasis on peer review. Therefore, it is necessary to strengthen the supervision of the peer review process and results and ensure the impartiality and authority of the peer review.

Thirdly, different countries and regions have different levels of development. The industries and research fields that the state supports are also very different. Therefore, it is necessary to set up an incentive plan and evaluation system according to the national conditions.

Finally, evaluation and rewards are just a means of motivation for researchers. The advancement of technology will not be stagnant because of the existence or reasonableness of evaluation and reward, because the promotion of scientific and technological progress is the inherent goal of science and technology researchers.

Of course, science and technology researchers, for the sake of our legitimate and reasonable interests and rewards, we should also actively participate in the activities of evaluation and reward reform, and actively provide reform opinions and measures to jointly promote social progress.

## References

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