

# A Scientific Approach to Creativity

How can we boost the power of creativity in order to stimulate groundbreaking innovations that will open paths to the future? To what extent have fields such as cognitive psychology, neuroscience, and management studies elucidated the question? The experts interviewed in this first issue of My Vision believe that the answer lies in each individual engaging in dialogues in order to enhance their capability to change their own concepts, and to train their brains in response to a changing environment. They also indicate that at the level of the company, it will be important to make effective use of external human resources and to create frameworks to put the abilities and aptitudes of individuals into full play, and further to create corporate cultures which connect the “dots” represented by individual pieces of knowledge and experience into a greater pattern.

MyVision

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## Expert Opinions

# Boosting Creativity and Inventiveness in Japan

We need a force to drive reform in Japan. What should we do in order to increase creativity and inventiveness? How should we approach the issue in the workplace?

We asked experts at the forefront of cognitive psychology, neuroscience and business studies.

Interviewer: Tetsushi Saito, NIRA Senior Researcher  
Period of interviews: August 2013

## Creativity and inventiveness are born from “dialogue”

Naomi Miyake

Professor, Graduate School of Education, The University of Tokyo

Creativity and inventiveness give us the capability to edit the differing thoughts of various individuals and in the process change our own ideas and ways of thinking. This capability is born from “dialogue”. The school at which I assist is currently conducting classes in which students engage in dialogue in small groups, and determine answers for themselves. The information necessary to providing the answer is divided among the students, and the students must engage in a process of sharing, explaining what they know to each other, checking details and organizing and putting this information together in order to formulate their own answer. Further dialogue results in changes to this answer. The creativity and inventiveness fostered in classes of this type are not fostered by accurately explaining something one has learned to another person or by reading and summarizing textbooks. This is because explaining accurately and summarizing do not incorporate any process in which the individual changes their own perspectives and ideas.

Two conditions are necessary in order to successfully introduce dialogue to the workplace. The first of these is creating a situation in which people with different ideas are all able to speak on an equal footing and to formulate answers together. Here, the differences in thinking between participants are an important factor. The second condition is that someone asks the appropriate questions to stimulate dialogue, sharing objectives, and formulating concrete answers in a mutual process. Understanding how they themselves are involved in this type of process will naturally deepen creativity among the participants. ■

## Looking at ways of working from the perspective of neuroscience

Takashi Tsukiyama

Director, Preventive Medicine Center, Kita-Shinagawa Clinic,  
Kohno Clinical Medicine Research Institute

The brain goes through two stages: Growth and maturity. If a person sticks at something for ten years, they will be a professional in their field. The brain becomes able to intuitively grasp the essence of a situation and make the optimal choices and judgments. Whether a doctor or a player of go, the professional who has continued in the field for 10 years or more is able to intuitively make the right choice. But this only corresponds to graduation from the growth stage. In order to become a professional among professionals, it is necessary to move beyond this, into the boundless stage of maturity.

The problem at this stage is the possibility that long years spent in a highly homogeneous group may dull the individual’s creativity and inventiveness. The brain reacts to heterogeneity and changes in its environment, and does not function correctly if not exposed to such factors. At times it is essential to seek out and expose oneself to situations marked by change and heterogeneity. For example, one might change one’s career. I think that the recently discussed proposal for 40 as the age of retirement for choosing a second career would represent an interesting concept for people at the stage of maturity.

I have spoken with many people over the course of years as an industrial physician, and I have been surprised at how many people who have been recruited in mid-career indicate that they do not intend to work for their company until the end of their career. These individuals have all been highly inventive. If you build up a diverse range of experiences from a young age and vigorously train your brain, you will activate your brain. It becomes easier to generate new concepts to the extent that one is a person who makes full turns in their career, without being afraid of failure or making mistakes. In this sense, creativity and inventiveness become richer to the extent that one has accumulated a great deal of experience over the course of years. ■

## Inventive human resources exist outside the company

Kazuhiro Mishina

Professor, Graduate School of Business Administration,  
Kobe University

People possessing creativity and inventiveness are people who are not easily satisfied with the status quo, who keenly feel the need to envision something new. Because most large Japanese companies hire safe individuals, people who will faithfully and accurately perform their duties, creative and inventive people are hard to find in them. It would be an illusion to believe that large companies are able to develop their employees’ creativity or inventiveness.

If companies need human resources possessing creativity and inventiveness, they should bring them in from outside the company. They should temporarily contract someone from outside on a per-project basis, provide that person with a budget and authority over personnel, and appoint them project leader. The development of i-mode by NTT DoCoMo and the design of a tractor for Yanmar by a former Ferrari designer are examples of successes achieved through the use of external human resources.

The strengths of Japanese companies are that their workers possess an extremely high level of basic ability in performing their jobs, and an ability to thoroughly carry out appointed tasks. External personnel will be attracted by this ability to realize their ideas. If it is possible in this way to mutually utilize each other’s strengths, there will be no need to be gloomy about the lack of creativity and inventiveness in Japanese companies. Abandoning the insistence that inventiveness and creativity are to be found within the companies themselves will be the key to future growth. ■

## Focusing on differentiation within organizations

Hajime Ota

Professor, Graduate School of Policy and Management,  
Doshisha University

The concept that companies select and foster creative personnel is a vestige of industrial society. In a post-industrial society, it is impossible to indicate in advance what type of abilities the individual should possess and what type of talent they should display, and there are no right answers regarding what are desirable work processes. We therefore have no choice but to base our evaluations entirely on work outcomes. The important thing is that superiors do not block or suppress the aptitudes and abilities of the individual. In order to make the best use of individuals’ aptitudes, they should allow the individual to freely choose their way of doing the job, within a flat organizational structure. Japanese organizations have been skewed towards “unification” so far, striving towards the realization of a single principle. In the future, we must put more effort into “differentiation,” increasing the freedom and autonomy of both departments and individuals.

Big ideas are not born simply from discussions in the workplace. It is essential that, before and after the discussion, individuals create concepts by themselves and plan by themselves, and companies must create working environments that make this possible. If companies created appropriate support and evaluation mechanisms, in which well-planned outcomes were evaluated for example by awards from outside the company, and these could be used in furthering the individual’s career, employee motivation would naturally increase. We should also make the change to evaluation systems able to encompass creativity, by means of methods that do not atrophy individualism. ■

## Creating concepts by “connecting the dots”: a lesson from Steve Jobs

Hiroshi Miyanaga

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Graduate School of Innovation Studies, Tokyo University of Science

Developing the custom of “connecting the dots,” as advocated by Apple founder Steve Jobs, is extremely important to a company’s success in creating new concepts. Ideas are not produced from zero; they are, rather, produced by creating new arrangements of existing elements. It is not only specialized knowledge that is important in accumulating these existing elements, but also general knowledge, the usefulness of which may not be obvious, and experiences that might tend to be overlooked. Compared to their failures, companies do not often investigate the reasons for a successful venture, but if they did, it would certainly rest in these “dots.”

It is also important to take advantage of unexpected opportunities. Koichi Tanaka, winner of the Nobel Prize in Chemistry, made a serious mistake in introducing the wrong substance to a mixture in an experiment, but rather than throwing away this accident, he persisted single-mindedly in his observations, and unexpectedly made a world-first discovery. This power of turning chance into good fortune is termed serendipity. The power to attract serendipity is also born from collecting and analyzing ordinary everyday information. When Komy Mirror enquired of a business which had purchased an unexpectedly high quantity of a rotating mirror whether the order had been mistaken, they learned that the mirrors were being used to prevent shoplifting. This unexpected “dot” led to an expansion of the company’s business domain. ■

### **What's NIRA?**

The National Institute for Research Advancement (NIRA) is an independent, private-sector research institute which defines urgent policy issues and formulates bold and timely policy proposals, seeking to contribute to the revitalization and further development of Japanese society and the Japanese economy.

Utilizing a network of scholars, researchers, and specialists in a wide range of subjects, NIRA works for the public benefit from a fair and neutral perspective, attempting to reinvigorate policy debate and contribute to the process of policy formation in Japan. The institute focuses on domestic social and economic policy, international relations, and regional issues in Japan as its principal areas of research.

Established in 1974 as a government-authorized independent research institution, NIRA became an incorporated foundation in 2007, and since February 2011 has been recognized as a Public Interest Incorporated Foundation.

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