

グローバル社会における 産学連携と研究者

Industry/academia Collaboration and Researchers in the Global Society

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グローバリゼーションの動きは様々な国に大きな変化をもたらしている。石油危機とその後の地球温暖化防止に対する国際的な動きによって消費者の低燃費車志向が高まり、それへの対応に遅れたGeneral Motorsが破綻した。大型車への固執と過信が新しい技術開発を遅らせたのではないかと推察する。しかし、企業化マインド豊かな研究者・技術者を多く抱え、産学連携が常態である米国がこのまま低迷を続けるとは思えない。

わが国の国際競争力が落ち始めた頃に科学技術基本計画が策定された。第一期（1996-2000）では基礎研究の強化、第二期（2001-2005）では経済・産業の再生を目指した産業競争力の強化、現行の第三期（2006-2010）では国民に成果を還元する科学技術を目標にしている。その結果、2008年度IMD国際競争力調査の科学インフラランクでは米国に次いで2位を堅持しているものの、総合力については1997年以降の20位前後から浮上していない。競争力評価項目の「基礎研究の長期的な経済発展への促進寄与」ではドイツ、米国、さらに韓国にも抜かれて12位、「産学の知識移転状況」が20位であることを踏まえると、基礎研究は大学や公的研究所、開発・製造は産業界というような役割分担型では通用しなくなっている。

国際競争力の向上には産・学が有する様々なknow-howを集結させて国を挙げて取り組まねばならない。ガラス関係では、(社)ニューガラスフォーラムが中心となって産学の出会いの場を設け、国の連携プロジェクトを実施している。「ガラス産業技術戦略2025年」を実現するには環境調和型の製品や製造に向けた革新的技術開発が今後必要となる。しかし、日本の大学は基礎科学や新機能性ガラスについては国際的にも高い評価を受けているが、技術関連の発表は極めて少ない。NEDOプロジェクトの事後評価に関わったことがあるが、「特に優れた」評価を受けたプロジェクトの多くは集中研究型体制で、プロジェクトリーダーが産・官・学の多種多様な人材を統率するゼネラルマネージャーの役割を果たした場合で、「厳しい」評価のものは「学」が分担型研究体制のアドバイザーの役割にとどまっていた。つまり、産学連携の成功には産と学が一丸となって連携するためのリーダーと研究者の存在が不可欠である。

そのためには、大学として「大学教育が国際経済競争の要求を満たしているか」の項目で40位という現在の低い評価を真摯に受け止め、技術を含めた高度な実践的教育に取り組む必要がある。当面、評価の高い外国の大学に頼ることになるが、先進国への日本人留学生数は10年前の6割近くまで減り、特に大学院生の減少が著しい。大学でも企業でも、短期渡航者は増えているが、直面する課題の対応に追われて研究者の海外の大学や研究所などへの長期留学は減っている。しかし、競争力を高める研究開発のあり方やその状況を実地で習得させることは、自らの研究開発課題を進めるためにも、国家的な連携プロジェクトに参画して実りのある成果を得るためにも役立つはずである。グローバル社会では、これまで以上に研究開発は人次第ということを念頭において適切な対応が望まれる。

Globalization is causing profound changes in many countries. Faced with the rising oil prices and the world-wide efforts to combat against global warming, consumers are showing stronger interest than ever before in fuel-efficient vehicles. Failing to adequately respond to such a trend in consumer attitude, General Motors has recently gone bankrupt. Heavy reliance on and undue attachment to large vehicles are believed to have delayed the development of new technologies. It is however unlikely that the United States, for which industry and academia collaboration involving researchers and engineers with vigorous entrepreneurial spirit is a normalcy, should stagnate long in the situation they currently find themselves in.

When Japan began to lose its competitive edge internationally, Science and Technology Basic Plan was formulated. Fortifying basic research was the major objective of the first phase (1996-2000) of the plan. Strengthening industrial competitiveness in order to renew our economy and industry was that of the second phase (2001-2005). Creating science and technology which render benefits to the people is that of the third phase (2006-2010) which is currently underway. The execution of the plan has contributed to Japan's maintaining the second place behind the United States in the scientific infrastructure ranking of the IMD World Competitiveness Yearbook of 2008. For the overall competitiveness ranking, however, Japan hasn't risen from around 20th since 1997. In the "Basic research does enhance long-term economic development," one of the evaluation items of the science infrastructure, Japan ranks twelfth behind Germany, the US and South Korea. In the item of the "Knowledge transfer is highly developed between companies and universities," we are the twentieth. In view of these facts, the role sharing is no longer viable of universities and public research institutions being responsible for basic research and industry for development and manufacturing.

In order to improve international competitiveness, industry and academia must come together to combine a variety of 'know-how' each is possessed of. In the glass-related field, New Glass Forum is playing the central role in providing the common ground for both industry and academia in implementing cooperative national projects. To achieve the goal of "Technological Strategy of Glass Industry 2025", drastic technological development will be in need for the creation and production of environment-friendly products. In fact Japanese universities are highly evaluated internationally for their achievements in basic science and in research on glass products of innovative functions. On the other hand, technology-related papers are scarcely published by them. When I was engaged in the post-evaluation of NEDO projects, it was noticed that those receiving the "excellent" evaluation were mostly intensive type projects in which project leaders functioned as general managers, taking leadership of the researchers and personnel of diverse abilities and interests from academia, industry and government, while those receiving the "marginal" evaluation were role-sharing type projects in which academia functioned simply as advisers. In other words, leaders capable of drawing researchers both from academia and from industry are essential for the success of any industry and academia collaboration.

In this regard, we must take seriously the fact that Japan ranks fortieth on the item, "University education meets the needs of a competitive economy" and must set out to create practical education involving high technology. For a while we may have to rely on highly-evaluated universities overseas for such education. At the same time I want to remind that the number of Japanese students studying in advanced nations has decreased by 40% from ten years ago. Particularly, decrease in the number of graduate students is phenomenally great. Both universities and industries are actually sending out people overseas but they are mostly for short-term stay. Cases of long-term study at graduate schools or research laboratories abroad are on the decrease, because of mounting needs for responding to tasks at home. On-site study overseas about the methodology and situations surrounding the development of an internationally competitive research however would be of great value for any researcher. Then, they will become capable of conducting their R&D tasks on their own as well as in participating in cooperative national projects and achieving fruitful results. Since researchers will play larger and more vital roles in research and development than ever before in the global society, it is hoped that both academia and industry take appropriate measures against training researchers.