

Abstracts

Changes in Graduate Education and the Academic Marketplace in Japan

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A university faculty position is a prototypical career choice for scholars, whose academic research is expected to form the background for their educational activities. This paper traces changes in graduate education, one function of which is to train university faculty, and examines the influence of those changes on the labor market for university faculty. Starting in the Meiji era and continuing through the beginning of the twenty-first century, graduate education in Japan has been expanding while at the same time changing in terms of both its legal standing and its actual content. From a historical perspective, we cannot necessarily conclude that the graduate education system has adequately fulfilled its function of training university faculty. The problems facing post-doctoral research fellows are growing more severe, leading some to argue that too many students are pursuing graduate education, in particular doctoral degrees. However, this argument focuses solely on employment following completion of a doctoral degree. The current reality is that when filling faculty positions, universities tend to hire candidates who have gained additional research experience following graduation from a doctoral program. To better understanding this situation, the present paper examines changes in graduate education, the current demand for candidates with graduate degrees in the academic labor market, and future prospects for this labor market.

Problems on Labor Laws in Relation to Younger Researchers

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In the environment formed by the increasingly intensive international competition due to the globalization of the economy, the stable cultivation of researchers with high levels of capacity to support the development of industries is indispensable to sustainable growth. Nevertheless, the research conditions and life environments for the younger researchers are not necessarily in favorable situations. Even if they have attained excellent achievements such as the acquisition of a doctorate degree, the researchers who can't get regular jobs at enterprises and research institutes are increasing each year, lighting a danger signal for the scientific development of Japan in the future. This paper picks up the problems on the labor laws in relation to younger researchers from judicial precedent and examines the legal issues.

The Current Status of Fixed-term Employment for Researchers

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The purpose of this paper is to indicate the current state of employment for young research personnel lacking stability from public statistics and the National Institute of Science and Technology Policy (NISTEP), and to indicate what sort of characteristics they retain compared with the employment environment as a whole in Japanese society, and to illustrate this on an evidential basis. First of all, while the number of post-doctorates has slightly decreased, the number of teachers employed according to the fixed-term employment system in recent years has increased, hence it is necessary to view both simultaneously. When viewed from Japanese society as a whole, even as irregular employment increases, the figures for those in the older age category of 55 and older are remarkably high, while the irregular ratio in males of ages 25-34 is about 10-15%. In the meantime, in case of academic staff, though its majority are males, the coeval irregularity ratio exceeds 50%. When viewing the employment state of new graduates of doctoral courses after about a year and half from the Japan Doctoral Human Resources Profiling (JD-Pro), the fixed term employment system in academia is 60%. Further, though the modal value of income is 4,000,000 to 5,000,000 yen, if viewed from the employers and the difference of employment terms, the fixed term employment of academia is low as a whole. When viewed by fields, the academic field and the arts field are glaringly low. Finally, using a complete survey of post-doctorates for fiscal 2009, we looked at the ratio of transfers to regular job. Although the transfer

rate is 6.3% on an annual average (male 7.0%, female 4.4%), in terms of educational background, male post-doctorates are remarkably low in comparison with male university graduates. From the result of a logistic regression analysis where the transfer ratio is made explicit, it becomes clear that in science and health-care fields, not having a doctorate or having been formerly unemployed or the like has a strong negative impact. In order to discuss science and technology policies and graduate school policies, we need to track the data of students to grasp what sort of education and research they perform at graduate schools, and how they play positive roles in society since then. In the future, the establishment of a good quality database in tandem with universities and administrative agencies is expected.

Characteristics and Issue of Career Paths for Postdoctoral Fellows in Theoretical Physics

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A postdoctoral fellow is an individual who, after finishing his or her PhD, seeks a permanent academic position, and conducts research as either a part-time or fixed-term researcher. The number of postdoctoral fellows became a problem in the 1990s. At this time, postdoctoral fellows were heavily oversupplied and caused stagnation in the labor market. The major reason for this oversupply was expansion of focuses particularly on postgraduate schools due to university reforms, which produced many holders of doctoral degrees. This paper looks at postdoctoral fellows in theoretical physics, since this specialty suffered the most serious employment shortage, and since this specialty engages in basic research with no direct route to applied research positions in companies. Additionally, the career paths of postdoctoral fellows in theoretical physics tend to be fixed early in life. It is extremely difficult for these postdoctoral fellows to alter the direction of their careers, even in the event that they grow old without obtaining a permanent position. An urgent need therefore exists to support these postdoctoral fellows' career development through career guidance reflecting their age and capacity, presenting employability based on prediction of supply and demand in permanent academic positions.

Research Careers, Motivations and Rewards of Inventors: Evidence from Inventor Surveys

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This paper, first, gives an overview of the careers, the motivations and the rewards for inventors, based on the inventor surveys conducted in Japan, the US and the EU. We found that young inventors accounts for a larger share in Japan than in the other countries, and consistent with this, Japanese inventors start inventive activities earlier in their lives and also exit earlier from their inventive careers than those in the US and Europe. On the other hand, there is a high degree of commonality of the inventor motivations among the three regions. In particular, "the desire to solve real-world problems" is ranked as the most important motivation. In the second part, this paper analyses the determinants of the wages for inventors in Japan (the sample covers only those inventors with incomes explicitly linked to the patents being 2% or less of their total income). The results find that even after controlling for age, experience, firm size and education level, the cumulative number of inventions and academic papers are significantly correlated with the wage variations among the inventors. Firms apparently use promotion based payment for rewarding high performance inventors, despite Article 35, presumably because it has the important advantages of promoting efficient project choices and of reducing the risks born by the inventors.

Leadership in the Research and Development Process: Literature Review and Specific Issues

Jun Ishikawa (Rikkyo University)

This study showed the following by reviewing previous leadership studies in R&D

settings. Most prior studies paid attention to transformational leadership and GK leadership as leadership styles. Further, prior studies examined the mediator effects of organizational commitment, group self-esteem, intrinsic motivation, psychological empowerment, psychological capital and commitment to change, which were individual-level variables, between leadership and individual R&D performance. Meanwhile, other studies examined the mediator effects of team climate, team efficacy, creative team efficacy, and communication, which were team-level variables, between leadership and R&D team performance. Moreover, this study showed that there remained five challenges in the future leadership research. These included international comparative studies, the effects of moderators between leadership and R&D performance, multi-level studies, the negative effects of leadership, the effect of leadership other than transformational and GK leadership. In addition, this study indicated that excessive role expectations by age, low frequency of communication, and internal isomorphism were major problems peculiar to Japanese companies. These obstructed the effects of leadership in Japanese R&D settings. This study also indicated that future studies should pay attention to shared leadership and leadership in diverse teams. Finally, this study discussed practical implication of the results of reviewing previous studies.

Cultivation of Researchers and Management for Research: Learn from American Experiences

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Nearly ten years have passed since national universities were incorporated in 2004. During this period, not only national universities but also the world of academia has come up against inexorable criticisms from outside and cutbacks in budgets from the government. While subsidies for operating costs, which is infrastructure expenditure of national universities, continue to fall, research expenditure has come to be allocated competitively. Further, this change has momentarily affected the research environments of universities, impacting on younger researchers rather than their senior colleagues. Such competitiveness in research environments was expeditiously started in the U.S. from the 1980s and substantially transfigured the world of academia. To cope with cutbacks in public funds, each research university has proceeded with multi-funding of research funds such as collaborative researches with industries, the expansion of contributions, global investments of university funds, linkage to university initiated ventures and the like. In tandem with the amplification of universities' activities connecting to external "private" interests, strict measures against interest contradiction and research frauds have come to be required, and researchers also have altered their awareness respecting careers by frequently transferring to other organizations, including industries and government agencies, seeking better research environments. As a result, the capabilities and roles of management of university headquarters, which carry out strategic decision making, have become extremely important. This paper discusses changes in research environments for scientists in the U.S. in terms of university management, and proposes suggestions for Japan's current status.