Discussion Paper No.49

University-Industry Links Personnel and Training in Japan:

A Review of Survey Results

October 2008

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要旨
近年、産学連携人材のスキル、資質および育成に関する課題が論じられている。本論文では、それらの論点を検討するに当たって、産学連携人材の現状と育成ニーズを評価するとともに、今後 10 年の将来に亘って必要とされる専門的職能について考察した。分析に使用したデータは、無作為抽出した 405 人の産学連携人材に対して質問票調査を実施した結果、231 人から得られた回答（回収率 57%）によるものである。また、本調査結果と、英国において実施された調査結果と比較を行っている。技術移転の経験者を雇用するという点では両国ともに似た結果となっている。
回答者の所属は、日本の広範な産学連携機関に亘っている。回答者の 48.2%は 55ー64 歳の年齢層に属しており、そのほとんどが企業または大学での研究経歴を有していたが、産学連携活動について何らかの特別な研修を受けたことのある者は、僅か 10.5%であった。両国共に実務者に対する研修コースを広げるための手段を講じているが、日本ではまだ相対的にＯＪＴ（仕事に就きながらの訓練）の方が特別な研修コースよりも職能を獲得する方法としては重視されている。、回答者の間では、国際的な産学連携活動のためのスキルの獲得が、技術に関する評価方法の習得とともに必要と認識されていた。英国における産学連携人材のキャリア調査結果と比較すると、専門家としてのトレーニングが日本ではほとんどみられない。
これらの調査結果は、産学連携人材の能力を今後高めていくためには、より効果的な研修機会（取り分け技術評価方法等を体系的に習得するための研修機会）の拡充と、計画的な OJT の実施が重要であることを含意している。

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Abstract

This paper explores the demand for training amongst personnel employed in university-industry links in Japan's university outreach offices. The paper explores these issues and assesses the profile, needs for training, as well as future requirements of the profession over the period to 2017. The paper is drawn from survey responses from a randomly selected sample frame of 405 personnel which generated 231 (57%) responses. Drawing on other studies performed in the United Kingdom, the paper will also make some comparative observations. In both countries there have been some challenges regarding the employment experience of personnel for technology transfer. In response, both countries have introduced measures for broadening the range of courses available for such personnel, but there are some differences. Respondents to the survey in Japan are from a range of university-industry organizations. The paper finds that 48.2% are between 55-64 years old with most having a background in business or university research. This differs from the UK. Also different from the UK, very few in Japan have engaged in any specialist training. On-the-job training (OJT) is generally preferred to specific courses and there is a desire to acquiring skills related to international university-industry activities, as well the elucidation of methods for the evaluation of technologies. The implications of the study relate to the exploration of more systematic evaluation systems, and assessing the use and adoption of OJT.

Keywords: Personnel, training, on-the-job-training, university-industry links, Japan

1. Introduction

Following wide-reaching reforms to the Japanese innovation system since the mid-1990s, universities have been expected to develop closer relations with industry and contribute to society. Within the university system, there are now a number of organizations associated or operating on behalf of universities for managing intellectual property, nurturing university inventions, spin-offs for economic exploitation, or managing research contracts or collaborative agreements between firms and universities. Since the 1990s, statistical indicators on university-industry links suggest upward trends in the number of university licenses, invention disclosures, contract research cases and collaborative research projects[1].

Despite this, there remains some debate and discussion over personnel involved in managing and implementing university-industry relationships, both from policy makers, university administrators, and numerous academic studies. These discussions have related to the contract basis of employing such personnel, the age profile, as well as the necessary skills. Earlier survey based research with university managers found that these issues were of some importance and may have shaped university-industry link performance. The same research also found that many managers outlined intentions to employ greater use of training in the period up to 2010. This paper seeks to further explore these issues and the demand for training amongst staff in Japan's university-industry related organisations.

Through drawing on survey results from 231 personnel involved in university-industry links, the personnel profile, work experience and background, as well as experience of specialist training will be reviewed. In particular the desirability of on-the-job-training (OJT) or special training courses will be explored. Issues surrounding the profession over the period to 2017

[1] The Ministry of Education, Culture, Sports, Science and Technology (MEXT) report that collaborative research cases between universities and industry have increased from around 3,000 cases in 1999 to just over 9,000 cases in 2003. Over the same period, contract research cases have increased from 6,000 to 7,000; invention disclosures have increased from around 1,500 to 7,000; income from licensing activity has increased from 191,443 thousand Yen to 427,655 thousand Yen (MEXT 2004).

will also be reviewed. As some of these issues have already been subject to analysis in other countries, where possible, this paper will seek to draw on this data to provide a comparative perspective to the discussion.

The paper finds that the age profile of those engaged in university-industry links are at more senior levels, that is 55-64 years old. Most respondents have come from the business sector, followed by the university sector. The contract basis is typically short-term and tends to fall within a five year period. Training has also been minimal and while there is a preference for OJT, respondents suggest that this may be under-utilized and subject to waste due to job rotation within the contract cycle, limiting the opportunities for knowledge accumulation. The need for greater stability in employment practices was observed, as well as the need for training more inclusive of international practices and network generation. The methods for evaluating both technologies and personnel were seen as areas requiring greater clarification, especially considering the narrow labour market and age profile of staff. The implications of the paper relate to the extension of the contract basis for personnel employed in university-industry links, a review of the systems in place for evaluating personnel and assessing how OJT or training is implemented.

The structure of the paper is as follows. In Section 2, the emergence and professionalisation of the technology transfer profession will be introduced as well as reference to prior studies that have noted the importance of personnel issues in university-industry links related activities. In Section 3, the methodology for the study will be outlined. Section 4 will introduce the empirical results. Here the profiles of respondents will be introduced, as well as the contract base and length of experience working in university-industry links. In Section 5, issues specific to training will be reviewed. Section 6 will draw on open comment sections and outline key issues confronting the profession. Section 7 is the conclusion.

2. Emergence and Professionalisation of Technology Transfer

Research suggests that university organizations such as licensing offices, venture support laboratories or other outreach offices can shape university interaction with industry. Studies have found that the skills held by licensing office and technology transfer personnel can be of importance, where staffing size (O'Shea et al. 2005), staffing practices (Siegel et al. 2003), staff salaries and incentives (Markman et al. 2004) or the age and skill base all play some role (Thursby and Kemp 2002). This point largely fits with what has been recognized by labour economists for some time. That is, that on-the-job training and training courses can have positive effects on the productivity of a workforce (Mincer 1962). For instance, studies by Becker supported the notion of OJT leading to productivity growth and wage increases (1993); Barron et al. found a robust effect of training on productivity growth for those that had received OJT (1999).

However, the skills required in technology transfer are particularly broad and typically grounded in a range of education and employment experiences, with many having backgrounds in business, science and law (see Sumikura and Nishimura 2007). Technology transfer personnel are generally involved in a range of tasks relating to the transfer of university technologies to industry. These include the evaluation of the potential of university discoveries, the development and management of patent portfolios, prosecuting patents, and negotiating licensing agreements, by which firms obtain use of a specific technology, and putting in place cooperative research agreements, or a range of other arrangements that can now exist between universities and industry. These activities typically draw upon a scientific background that may have been complemented by business experience or a Masters of Business Administration. In performing these tasks, personnel draw on a range skills which include communicating with academic researchers on their types of research, evaluating the

potential of technological seeds as marketable technologies, and assessing potential adopters for these technologies. On top of this, personnel need to be able to coordinate and link the two partners together to find mutual agreement, as well as draw on a range of financial resources and other supports, for the nurturing and development of technologies.

Over time, as the profession of technology transfer and university-industry links has developed, the need for training has also shifted into focus. In the United States, for instance, where technology transfer in its current form took shape, the profession emerged largely in an incremental fashion over the course of three decades. As Popp Berman has noted, during the 1960s there was 'no professional community of patent administrators' at universities, with a small number of relevant universities that formed the basis of an informal network meeting on a periodic basis (Popp Berman 2006: 9-10). This informal network gradually consolidated in the form of a professional association such as the Society of University Patent Administrators (SUPA), a precursor to the Association of University Technology Managers (AUTM), which emerged in the mid 1970s. At the same time, there were attempts at training those involved in evaluating the patentability of university inventions through the emergence of outreach courses provided by the Research Corporation (Mowery et al. 2004: 75-76).

The introduction of the Bayh-Dole Act in 1980 acted as a catalyst for further professionalisation and development of the technology transfer community (see Popp Berman 2006: 18) and a "maturation of the practice of technology transfer" (Amidon 1996). Today, there are around 1,700 full-time-equivalent personnel involved in technology transfer in the US (AUTM 2007) and in many ways the development of technology transfer there has acquired the tenets of a profession. That is, taking on full-time characteristics, the existence of special training; the emergence of specialist associations, the development of rules or formal codes of ethics, as well as the political agitation of legal reforms (see for example, Wilensky 1964).

In Japan broadly similar trends have also began to occur yet these have been within a much narrower time frame. The system overall is still at an early level of development in comparison to what has occurred in the US and other countries. Prior to the mid-1990s, university-industry links proceeded on a largely informal basis with university invention committees determining whether a technology should belong to the nation or whether the intellectual property should be held by the researcher. Universities failed to exploit intellectual property due to a lack of capacity, social constraints and a recognition that national capabilities for patent application management and use were limited; more likely to act as a barrier to the use of inventions than as a stimulus. While some saw this system as relatively inefficient (Kneller 2007), technology transfer proceeded through a donation based system using a give and take relationship between firms and industry (Aoki and Harayama 2003). While this system was "fast and low cost", many university technologies granted to firms were underexploited with most interaction taking the form of basic science issues or narrowly defined tasks (Kneller 2007: 439). Motivated by efforts to reverse this situation as well as through observation of the success of the US economy throughout the 1990s, a number of policy measures were introduced that have gradually formalized the relationships between universities and industry and introduced organizations and a more legal structure to transfer activities[2],[3]. Since 1998, when changes were introduced allowing universities to establish

[2] These measures include the Law to Promote the Transfer of University Technologies (1998: Law No. 52); Law of Special Measures to Revive Industry (1999: Law No. 31); Law to Strengthen Industrial Technology (2000: Law 44) and the National University Incorporation Law (2003: Law 112).

[3] Echoing findings from the US literature which has cast some doubt on the formal models of technology transfer (Mowery et al. 2001; Colyvas et al. 2001) the Japanese literature has also begun to debate the suitability of the new system against the old informal system (e.g. Nagata 2006).

relations with Technology Licensing Organisations, 44 such organizations have now emerged (as of Autumn 2007) which are either private companies, non-profit corporations or organizations embedded within a university (MEXT 2007). Furthermore, following more concerted policy efforts related to intellectual property protection and exploitation, universities were encouraged to take a more strategic approach to intellectual property issues and Intellectual Property Strategic Headquarters (IPHQ) were established at many universities from 2003[4]. There are now 43 throughout Japan.

These various new organizations have required personnel which have come in the main from business and academia. At the same time, public funding has been developed by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) and the Ministry of Economy, Trade and Industry (METI) to support these organisations, and the staff employed. At the personnel level there are around eight funding programmes that support coordinators, advisors and managers, with programmes provided by the New Energy and Industrial Technology Development Organization (NEDO)[5], the Japan Patent Office (JPO) [6], the Japan Science and Technology Agency (JST)[7], MEXT[8], and METI[9] (see NISTEP 2005: 50-51). Each of these funds support particular skills and specializations within the technology transfer process (see Saito 2007: 19).

However, many of these programmes have only been funded on a relatively short-term (2-3 year) basis, with concern raised in some quarters that it has hindered the accumulation of knowledge within universities and diminished the capacity of universities to effectively develop skills (Tayanagi 2007: 10). Arai, a former Director of the Intellectual Property Section in the Cabinet Office, observed that amongst a general lack of people with sufficient knowledge of intellectual property, there has also been a lack of qualified people for university intellectual property offices (2005), and annual strategic plans introduced by the Intellectual Property Headquarters in the Cabinet Office have sought to redress this situation through extending graduate provision and other human resource development programmes. Amongst the types of skills which have been found to be of importance have been the marketing of technologies (Watanabe 2004), and communication between incubation managers and client companies (Tansho and Nagata 2006). Furthermore, what is acknowledged is that the types of links held with firms are increasingly diversified and extend beyond a license holder-licensee relationship and university donations, but have also come to include venture development, internships and comprehensive agreements (see Tayanagi 2007).

In earlier survey based research with university-industry liaison managers in Japan exploring the issues confronting university-industry links (Woolgar 2007), it was found that personnel issues were frequently cited as one of the key issues following the incorporation of the universities in 2004 (Table 1). Interviews with these respondents identified issues to be management capabilities, difficulty of movement between sectors of the economy[10], and a lack of training.

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[4] Following passage of the Intellectual Property Basic Law in 2002 (Law 122), universities were encouraged to introduce Intellectual Property Headquarters in Universities. See also, Intellectual Property Strategic Plan 2004

[5] NEDO fellowships were first introduced in 2003. Just over 100 fellowships are provided annually. Each fellowship has a three year duration.

[6] Patent Circulation Advisors were first supported by the JPO from 1997.

[7] The Regional Science Promoter (RSP) programme from 1996.

[8] University-Industry Government Support Fund from 2002.

[9] University Venture Management Support Fund from 2003.

[10] On this point, see Cabinet Office (2006)

Table 1. Current Issues Confronting University-Industry Links Managers (2005) (*n*= 61)[11]

	Total Mean	S.E.
Staffing Issues	4.19	.90
University Faculty not Sufficiently Interested	3.22	1.01
Insufficient Research Results	3.00	.96
Insufficient Demand from Industry	3.00	.88
Difficult Procedures	2.92	.91
No problems	2.90	1.20
Incompatible Organizational Culture	2.82	1.13

Source: Woolgar (2007)

It was also found in this study that although the most important issue to be tackled over the period to 2010 would be the location and pursuit of profitability, university managers indicated that importance would also be placed on the training of personnel, which was ranked as the second most important issue (Woolgar 2007: 7).

Japan is not alone in experiencing these difficulties. In the UK, for example, commentary has been made that "Many technology-transfer offices are frankly not very good" (Richards 2006). In one study, which looked at technology transfer in the United Kingdom, it was suggested that the introduction of specific training and skill development could enhance transfer performance (Chapple et al. 2005) and that many of these offices were too large. A 2002 report by the Bank of England suggested that "Technology transfer offices lack the necessary experience and expertise and there needs to be an increase in resources available to these offices" (2002). As a result of this, greater efforts were made towards expanding the range of training courses available in the UK through the establishment of the Praxis programmes, and AURIL programmes (see Woolgar 2006); in short an expansion of training provision in order to develop the UK technology transfer system.

The issue of personnel training is therefore of some importance, and in linking this research with other studies which have explored the profile of staff and their backgrounds (Senoo et al. 2006; Sumikura 2003; Sumikura and Nishimura 2007) this paper will seek to review the types of training that may be desirable amongst university-industry personnel. The objectives of this paper are as follows:

1) Explore the employment background of university-industry personnel
2) Explore whether training in technology transfer and other forms of university-industry activity has occurred
3) Explore whether there are perceived weaknesses or strengths in the current skill profile of personnel
4) Assess the demand for training and locate whether this training should be on-the-job (OJT) or through specialist courses
5) Identify the major issues facing the university-industry community in the period to 2017.

Prior to addressing these points, the paper will begin by introducing the research methods used to support the paper.

[11] Question: "What are the main issues currently confronting your organization?" Rank ordered question: 1 equaled less importance; 5 equaled high importance.

3. Research Methodology

This paper is drawn from a questionnaire survey that was sent to individuals based in technology transfer and other outreach offices in Japan in 2007. Organisations included in the sample frame was limited to those associated with the national universities[12], including intellectual property headquarters[13], technology licensing organizations[14], incubation centres and venture business laboratories[15], as well as regional collaborative research centres[16]. The lists of these institutions were located from the Japan Association of National Universities (JANU), a MEXT list of registered TLOs and regional innovation centres, as well as a list of incubation centres. As the survey instrument was targeted at the individual level, only those centres that listed staff on their homepages were included in the sample frame.

The sample frame was developed over October and November 2006 with the homepages of various centres and organizations reviewed to locate staffing lists. Of the total 87 national universities, 51 institutions listed such information. Of the then 42 Technology Licensing Offices recognized by MEXT, information on personnel could be located in 19 institutions. Furthermore, amongst a total of 44 Venture Business Laboratories, information on personnel could be located in 9 organisations.

The sample frame is thus somewhat broader than the TLO specific questionnaire undertaken by others (for instance, Senoo et al. (2006)). This has both advantages and disadvantages. On the one hand it provides a snapshot of the general situation within the diverse university based university-industry link community. On the other, the broader range of institutions may complicate the different skill and institution specific messages which may exist. The cross-tabulations used in this reports seek to tease out these institution specific differences. A further point is that, similar to the surveys undertaken in the UK, coverage of a broader range of organisations may be more interesting.

Each list of personnel derived from the web-search was saved to hard-disk, ultimately providing a database of 884 names, addresses, job roles, and email addresses. While a range of different job titles existed, in the main the sample frame included all those that did not hold administrative or visiting positions. For instance, of the total sample frame, 12.1% were the Head or Deputy Head of the organization. 30.8% were the Section Head, or listed as a Professor, manager, lawyers 31.8% were listed as Assistant professors, or coordinators; 12.2% were advisors; 6.6% were assistants or researchers; 6.6% did not list job title.

From this, 405 names were randomly selected and sent a copy of the questionnaire. The questionnaire comprised 12 questions, of which two were open comment responses. Closed format questions were either single tick boxes or likert style format. The questionnaire was posted with a pre-paid return address envelop in February 2007. Reminders were then posted in March 2007. In total the questionnaire was returned by 231 respondents, or 57% of the sample frame.

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[12] The national universities can be considered as the main performers of research and development in Japan, with a larger number of natural science and engineering faculty than the private universities, and a significantly higher proportion of "Kakenhi" or research budgets (see Kondo 2006).

[13] Intellectual Property Headquarters were established from 2004. Their main role is intended to promote university-industry links through strategic planning, collecting data and identifying necessary adjustments in university specific regulations.

[14] TLOs were first established from 1998. They are the main avenues for transferring technologies from universities to industry.

[15] Venture business laboratories support venture firms and provide subsidized accommodation and facilities often in close proximity to a university.

[16] Collaborative research centres are active in collaborative research projects, as well as network initiatives, chiefly with regional and local firms.

3.1 Respondent Profiles

A profile of respondents to the questionnaire is presented in Table 2.

Table 2. Survey Respondent Profile (%) (n=213)

Professor/Visiting Professor	16.6
Lecturers or Assistant Professor	33.6
coordinators, advisors or lawyers	19.2
Organization Head	11.2
Postdoctoral researchers/NEDO fellows	4.4
Other	15
Total	**100**

Source: Survey results

The organizational affiliation stated by respondents is presented in Table 3.

Table 3. Organizational Profile of Respondents (%) (n=220)

Intellectual Property Headquarters	38.2
Collaborative Research Centre	21.4
Other outreach office	14.1
University department	9.6
Technology Licensing Office	14.6
Venture Business Laboratory	2.3
Total	**100**

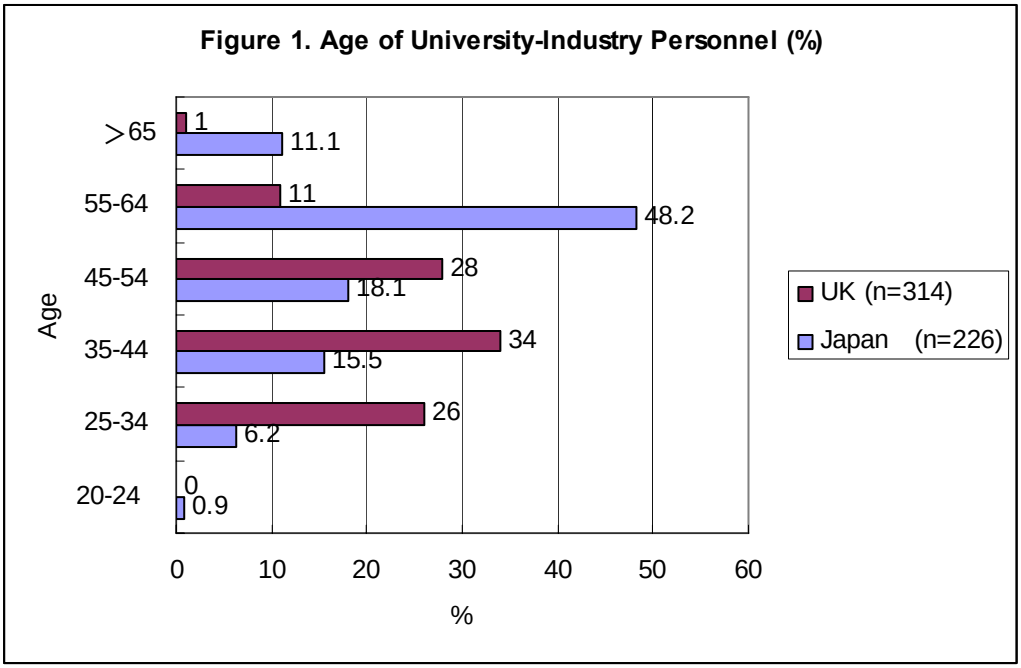
Source: Survey results

4. Japan's University based University-Industry Personnel

This section, drawing on the questionnaire results, will introduce Japan's university-industry personnel by reference to the age profile and background, contract basis, as well as work and training experiences. The data is drawn from the survey with Japanese technology transfer personnel.

4.1 Age Profile and Background

In Figure 1, Japan most respondents (48.2%) are in the 55-64 age category; followed by 18.1% who are within the 45-54 age category. In a survey with UK personnel performed by AURIL in 2005, the average age of personnel in the UK tended to be between 35-44 (34%), with very few within the 45-54 age category (28%), or the 55-64 age category (11%) (AURIL 2005)



Source: Japan: Survey results;UK: AURIL (2005)

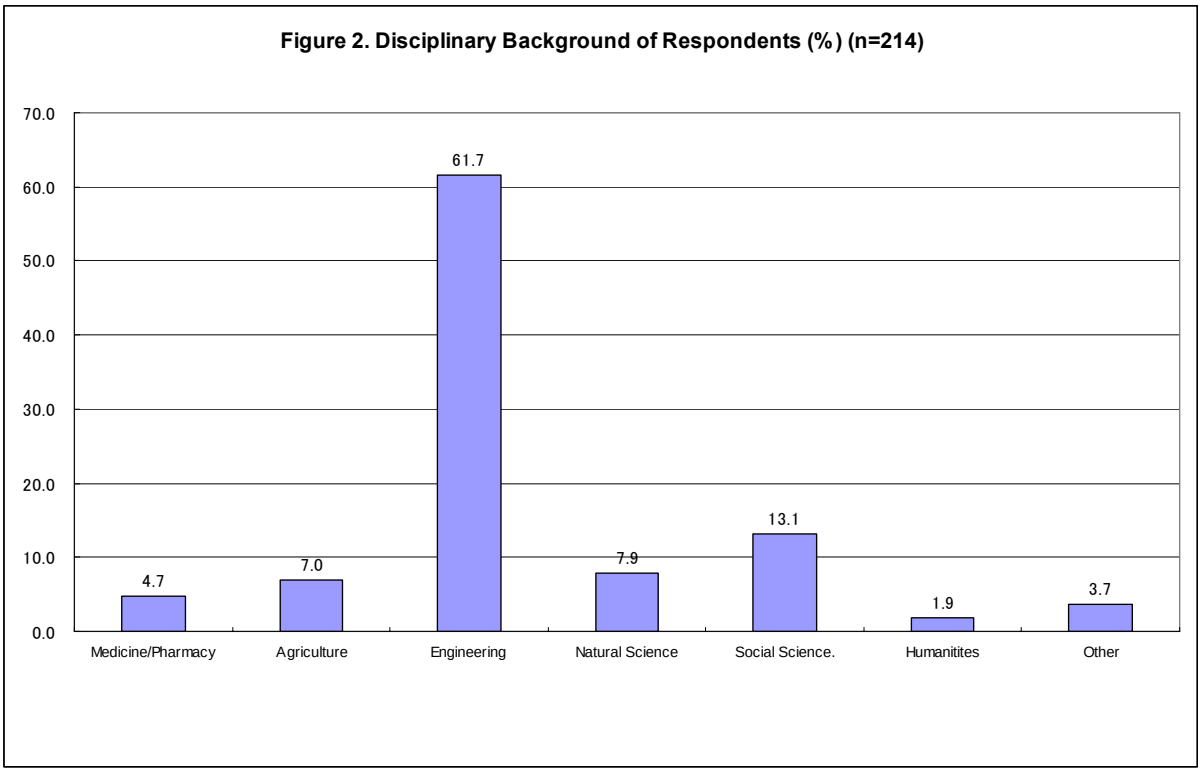
For the educational level (Table 4), most staff tend to be educated to the bachelors level (45.1%) followed by 25.6% who have been educated to the doctoral level. 24.8% have received a masters degree, with 3.5% and 5.6% having received education at specialist schools or at the high school level respectively.

Table 4. Educational Attainment of Respondents (n=226)

Final Education	Percent
High School	3.5
Technical School/Junior College	0.9
University	45.1
Graduate (Masters)	24.8
Graduate (Doctorate)	25.7
Total	**100**

Source: Survey results

In terms of the disciplinary orientation of the highest level of education attained by respondents (Figure 2), this was mostly in engineering (61.7%), followed by commerce and economics (8.4%), science (7.9%) agricultural sciences (7.0%) and medicine/pharmacy (4.7%). Those with a legal education were 2.8% of respondents.



Source: Survey results

These results are somewhat in line with the Sumikura and Nishimura sample of participants at the AUTM meeting in 2007. Here it was observed that most have a background in science and technology (85%). This was followed by 21% who had a business (MBA) or management of technology background, and 18% who had a legal background (Sumikura and Nishimura 2007).

4.2 Contract Basis and Experience in University-Industry Links

The survey learnt that most respondents (74%) are attached solely with their organization and are not seconded from elsewhere.

Table 5. Nature of Employment (%) (n=223)

Seconded/Dispatched from another organization	26
Attached solely to present organisation	74
Total	**100**

Source: Survey results

Most respondents indicated that they have no set term for the duration of their employment (45.3%). This is followed by 18% who report that they have a contract between 2-5 years. The smallest number of respondents have contracts that run longer than 5 years (9.3%). There are some differences by organization, as presented in Table 6. Those with no-set term tend to be found principally in the Other Outreach Offices (11%), university departments (9.3%), and Collaborative Research Centres. These three organizations tend to employ university faculty. Amongst the other organizations, there is a tendency towards 1-2 year contracts and 2-5 year contracts.

Table 6. Contract Duration by Organizational Type (%) (n=172)

	No Set Term	<1 Year	1-2 Year	2-5 Year	>5 Year	**Total**
Intellectual Property Headquarters	8.1	8.1	7.6	8.7	3.5	**36.0**
Collaborative Research Centre	9.3	1.2	2.3	3.5	3.5	**19.8**
Other Outreach Office	11.0	0.6	3.5	0.6	0.6	**16.3**
University department	9.3	0.0	0.6	1.7	0.6	**12.2**
Technology Licensing Office	6.4	1.7	1.2	3.5	0.0	**12.8**
Venture Business Laboratory	1.2	0.0	1.0	0.0	1.2	**2.9**
Totals	**45.3**	**11.6**	**16.1**	**18.0**	**9.3**	**100.0**

Source: Survey results

In terms of employment duration in university-industry links (Table 7), 45.4% of staff have between 2-5 years of experience. 20.4% have more than five years of experience. Only those that listed their university department have the longest experience (6.4%)[17].

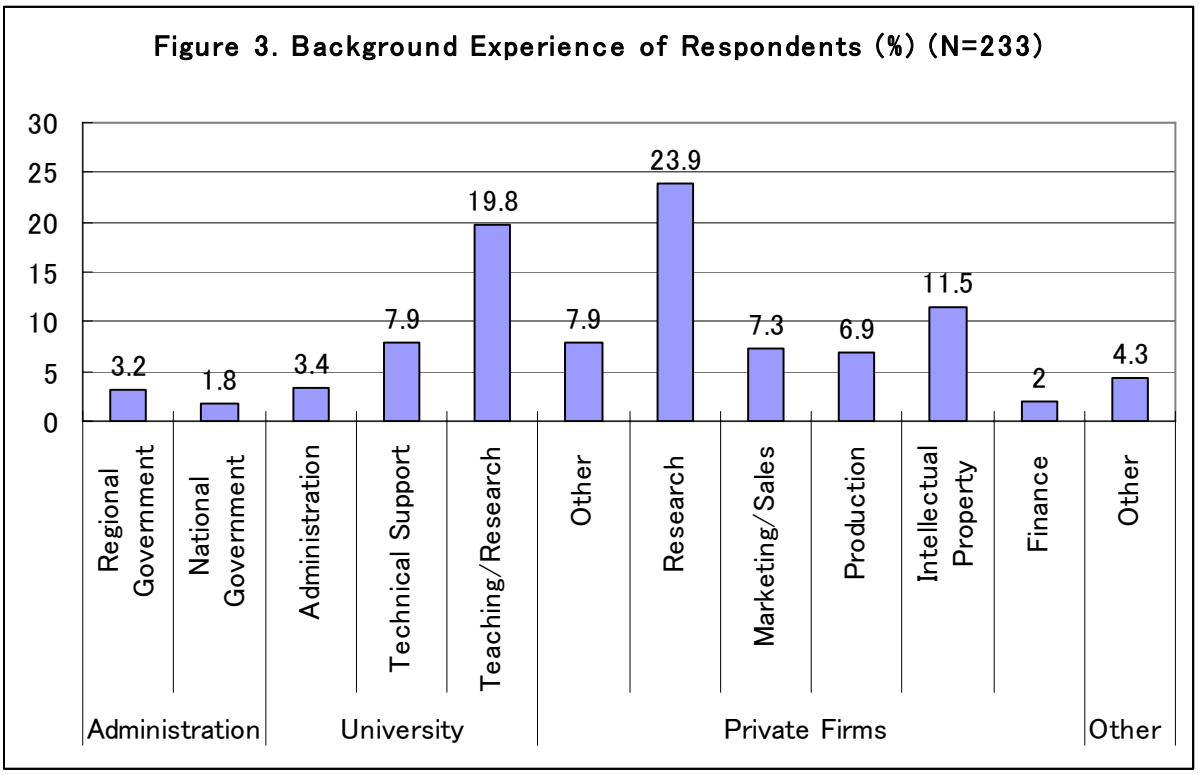
Table 7. Duration of Employment in Current Organization (%) (n=218)

	<1 Year	**1-2 Years**	**2-5 Years**	**>5 Years**	**Total**
Intellectual Property Headquarters	6.9	6.9	19.7	4.6	**38.1**
Collaborative Research Centre	6.0	4.1	7.3	4.1	**21.6**
Other outreach office	3.2	1.4	7.8	1.8	**14.2**
University department	1.4	0.5	1.4	6.4	**9.6**
Technology Licensing Office	0.9	1.8	8.3	3.2	**14.2**
Venture Business Laboratory	0.5	0.5	0.9	0.5	**2.3**
Total	**18.8**	**15.1**	**45.4**	**20.6**	**100.0**

Source: Survey results

Looking at the employment background of technology transfer personnel, in Figure 3 responses to a question which requested respondents to indicate all their previous employment experience found that most have experience in private sector research (23.9%) followed by academic research or tuition (19.8%). Very few have experience in private sector IP management (11.5%), finance (2%) or marketing/sales (7.3%). At a general level, these findings largely replicate the findings of the Watanabe (2006: 5) study.

[17] In the UK case, 56% have worked in university-industry links for more than four years (42% have between 4-9 years experience; 14% with more than 10 years); and 44% have less than 3 years experience (33% have between 1-3 years experience; 11% had less than 1 year's experience) (AURIL 2005: 11).



Source: Survey results (Multiple Answers allowed)

5. Experience of Training, Evaluation of Current Skills and Demand for Further Training

The number of training providers in Japan has gradually expanded over the years, with courses provided by a number of organizations (see Exhibit 1 below). Specialist courses have various structures, comprising part-time evening tuition or intensive half day or full day courses; more specialist programmes in Management of Technology (MOT) as well as courses offered specifically by universities.

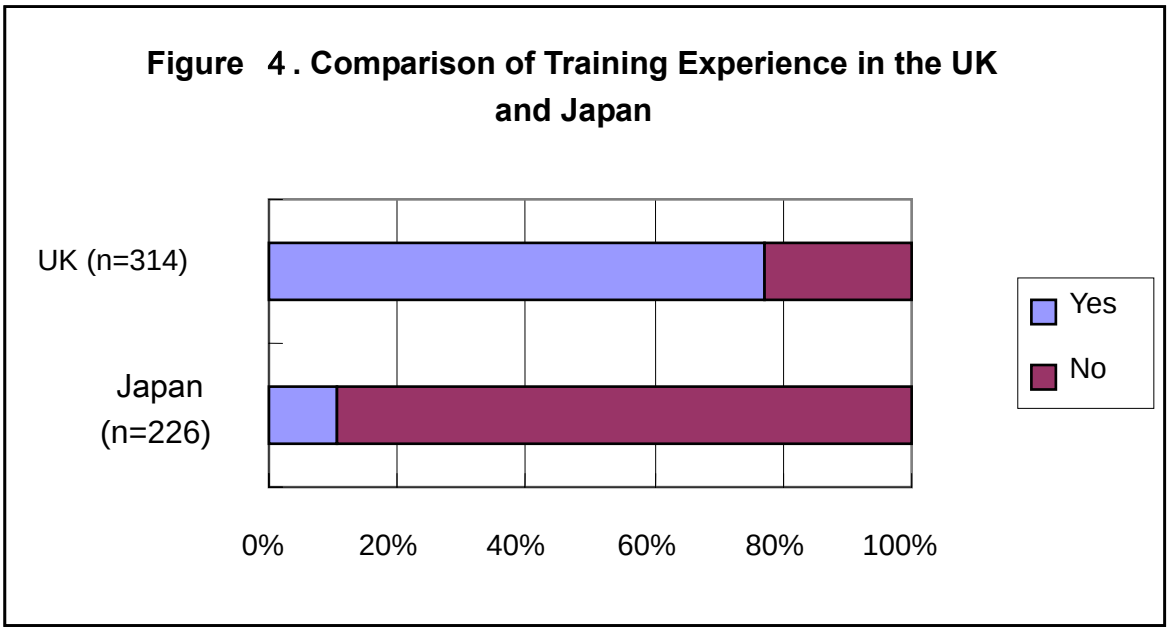
Furthermore, use has been made of on-the-job-training (OJT), which can comprise tuition from a senior peer (Watanabe 2003) in a structured ongoing pattern of learning which can be include training over a number of hours, or over a number of years on a periodic basis. At another level, OJT may be more informal and less structured (JIL 2007). Other forms of learning may comprise self-tuition through the use of manuals and technical documents[18].

When respondents were asked to indicate whether they had experience of relevant training in university-industry links(Figure 4), most respondents indicated that they had not undertaken any training (77.6%)[19].

[18] The AUTM have a Technology Transfer Practice Manual. A publication outlining failures and successes in technology transfer is currently under development by MEXT.

[19] This figure appears to be quite different in other countries. In a 2005 survey by AURIL, it was found that a minority, 23%, of those surveyed had never undertaken any training (2005: 15), while 77%had received training. There are thus marked differences between Japan and the UK.

Figure 4 . Comparison of Training Experience in the UK and Japan



Sources: Japan: Survey Results; UK:AURIL 2005

Looking at these figures by organizational affiliation (Table 8), training is most frequently used in the Intellectual Property Headquarters (8.7%) and the Technology Licensing Offices (5.9%).

Table 8. Experience of Training by Organizational Affiliation Type (%) (n= 219)

	Training	No Training	Total
Intellectual Property Headquarters	8.7	29.2	**37.9**
Collaborative Research Centre	4.1	17.4	**21.5**
Other outreach office	3.2	11.0	**14.2**
University department	0.5	9.1	**9.6**
Technology Licensing Office	5.9	8.7	**14.6**
Venture Business Laboratory	0.0	2.3	**2.3**
Totals	**22.4**	**77.6**	**100.0**

Source: Survey results

Of the 10.5% that had received training in Japan, the Japan Science and Technology Agency (JST) was cited 24 times by respondents followed by the Japan Institute of Invention and Innovation (JIII) (7 cites), the Japan Association for the Advancement of Research Cooperation (JAREC) (7 cites), the University Technology Transfer Association (UNITT) (4 cites), and the Japan Association of New Business Incubation Organizations (JANBO) (4 cites), the Ministry of Education and university providers, such as Yamaguchi University or Tokyo University. 3 respondents had received training overseas at the AUTM.

Exhibit 1. Example Courses Provided by Providers Cited by Respondents

Japan Institute of Invention and Innovation (JIII)	Various one day courses for beginner to advanced levels mostly looking at intellectual property issues. *Example Courses:* • Outline of European and American Patent Systems • Trademark System Management • IP Activities in Companies
Japan Association for the Advancement of Research Cooperation (JAREC)	JAREC provide one day and two day basic and advanced courses on various subjects. *Example Courses:* • Marketing • Business Planning • Management of IP • Government Support Systems • Brush-up course
Japan Association of New Business Incubation Organizations (JANBO)	Half-day courses related to incubation are provided for those at different levels of their careers. Example Courses include: • Incubation Manager (Induction; foundation; planning and management) • Overseas business incubation • Incubation manager practical ability training (leadership)
University Technology Transfer Association (UNITT)	UNITT provide one-day seminars in the following: • Networking

Sources: Drawn from Woolgar (2006); organization websites

With regard to current skills, the questionnaire asked respondents to indicate whether the skills they held with regard to 17 types of university-industry links activities were “sufficient” or “not sufficient”. The table uses two calculation methods.

Firstly, using a cross-tabulation by age presented under the “20-24”, “25-35”, “35-44”, “45-54”, “55-64” and “above 65” categories, Table 9 shows that younger respondents tend to cite more areas as “Not Sufficient”. In particular, skills relating to dealing with patent applications, technology evaluation, and communication with industry were deemed to be insufficient by those under 34. More senior personnel have greater experience across all areas, with the exception of license marketing, research contract negotiation, and some of the venture and information related activities.

Secondly, the table shows the overall total for the differences between the “sufficient” and “not sufficient”, presented under the “Ratio“ heading. Here it is apparent that the areas where skills are seen to be “not sufficient” is in license marketing, venture establishment, financing and planning; and databases.

Table 9. Self Reported Skills (Sufficient and Not Sufficient) (%)

		AGE						
SKILL REQUIREMENTS		**20-24**	**25-34**	**35-44**	**45-54**	**55-64**	**>65**	**Total Ratio**
Intellectual Property								
a. Patent Application (n=133)	Sufficient	0.0	3.2	15.8	13.7	53.7	13.7	71.4
	Not Sufficient	2.6	7.9	21.1	18.4	50.0	0.0	28.6
b. License Agreement Drafts (n=114)	Sufficient	1.6	1.6	12.9	14.5	56.5	12.9	54.4
	Not Sufficient	0.0	7.8	19.6	15.7	47.1	9.8	45.6
c. License Marketing (n=103)	Sufficient	0.0	0.0	19.5	19.5	51.2	9.8	39.8
	Not Sufficient	1.6	8.2	16.4	11.5	59.0	3.3	60.2
Collaborative/Contract Research								
d. Locating Collaborative Seeds (n=152)	Sufficient	0.0	1.8	16.5	16.5	53.2	11.9	71.7
	Not Sufficient	0.0	9.5	19.0	16.7	52.4	2.4	28.3
e. Research Contract Negotiation (n=150)	Sufficient	0.0	0.9	15.6	17.4	52.3	13.8	72.7
	Not Sufficient	0.0	7.5	15.0	22.5	52.5	2.5	27.3
f. Research Contract Drafting (n=122)	Sufficient	0.0	0.0	6.8	18.2	56.8	18.2	65.6
	Not Sufficient	0.0	8.2	20.4	12.2	49.0	10.2	34.4
Venture Business Support								
g. Venture Establishment (n=94)	Sufficient	1.3	1.3	15.0	16.3	50.0	16.3	46.8
	Not Sufficient	0.0	4.9	14.6	21.9	53.7	4.9	53.2
h. Introduction of Finance (n=74)	Sufficient	0.0	0.0	6.3	28.1	53.1	12.5	29.7
	Not Sufficient	0.0	8.3	20.8	12.5	41.7	16.7	70.3
i. Planning or Business Models (n=81)	Sufficient	0.0	0.0	6.3	28.1	53.1	12.5	39.5
	Not Sufficient	0.0	8.3	20.8	12.5	41.7	16.7	60.5
Information								
j. Collection and Analysis (n=151)	Sufficient	0.0	3.2	12.6	17.9	51.6	14.7	63.6
	Not Sufficient	0.0	12.7	18.2	23.6	43.6	1.8	36.4
k. Presentation and Publication (n=130)	Sufficient	0.0	5.4	18.9	18.9	39.2	17.6	56.9
	Not Sufficient	0.0	7.3	12.7	21.8	54.5	3.6	43.1
l. Databases (n-94)	Sufficient	3.1	6.3	18.8	25.0	43.8	3.1	34.0
	Not Sufficient	0.0	6.6	16.4	13.1	47.5	16.4	66.0
Other								
m. Leadership (n=182)	Sufficient	0.0	1.5	12.2	17.6	55.7	13.0	72.5
	Not Sufficient	0.0	12.0	22.0	24.0	34.0	8.0	27.5
n. Communication with Industry (n=193)	Sufficient	0.0	1.5	12.2	17.6	55.7	13.0	81.8
	Not Sufficient	0.0	12.0	22.0	24.0	34.0	8.0	18.2
o. Communication with University Inventors (n=186)	Sufficient	0.7	3.3	13.3	16.0	54.7	12.0	81.1
	Not Sufficient	0.0	11.4	17.1	28.6	34.3	8.6	18.9
p. Technology Evaluation (n=177)	Sufficient	0.0	3.9	8.7	18.4	54.4	14.6	58.7
	Not Sufficient	1.4	6.8	20.5	19.2	45.2	6.8	41.3
q. Budget Management (n=130)	Sufficient	0.0	2.7	9.5	20.3	55.4	12.2	56.9
	Not Sufficient	0.0	5.5	16.4	20.0	43.6	14.5	43.1

Source: Survey results

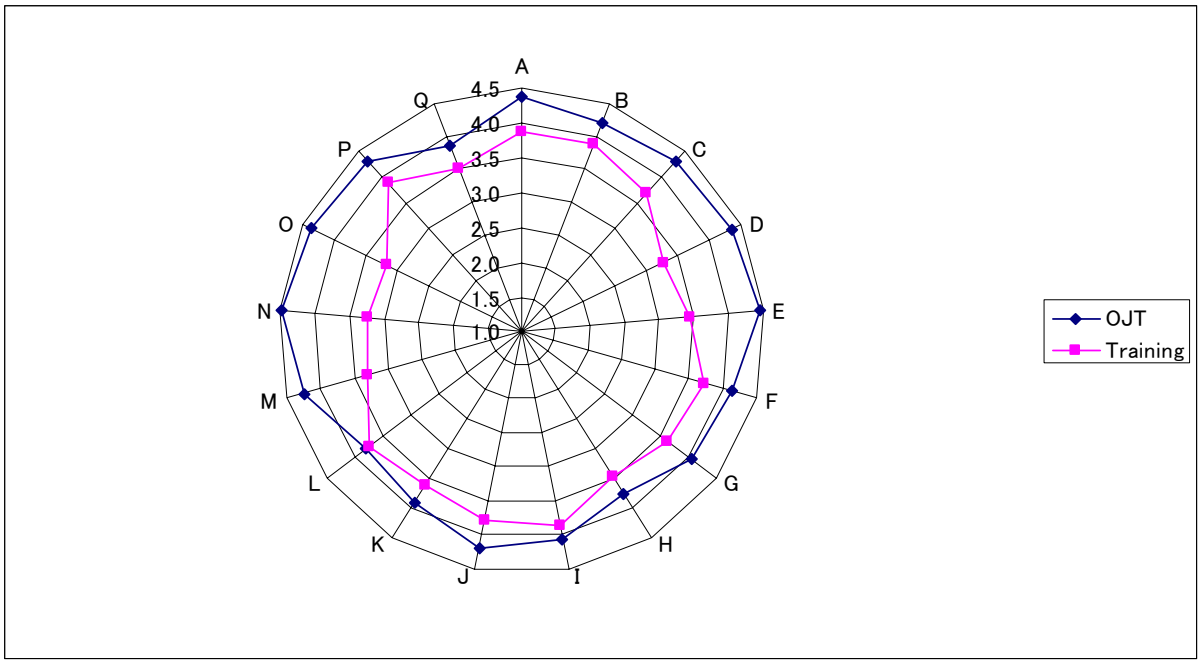
With respect to the types of training that were desirable, Figure 5 shows results for a question which asked whether OJT was preferable to training courses. This question used a 1-5 ranking, where 1 equaled “not important” and 5 equaled “very important”.

Using the same range of skill sets as those introduced in Table 9, in Figure 5 it was found that OJT was preferred in a large number of cases. This related to the negotiation of contract and collaborative research cases (E) (OJT: 4.5; training: 3.4), communication with industry (N) (OJT: 4.5; Training: 3.2), communication with university inventors (O) (OJT: 4.4; Training: 3.2), patent applications (OJT: 4.4; training: 3.9), locating Collaborative Research Seeds (D) (OJT: 4.3; Training 3.3) and leadership (M) (OJT: 4.2; Training: 3.8).

Overall, where skills are seen as insufficient, OJT is seen as the main source of acquiring new knowledge and this is in most areas. There is only one area where training equals OJT and that is in database use (L) (OJT: 3.8; Training: 3.7). The demand for training is weakest with regard to leadership (M) (Training 3.3), locating collaborative research seeds (D) (Training 3.3), communication with industry (N) (Training 3.2), and communication with university inventors (O) (Training 3.2).

Two crosstabulations of these results against “age” and “type of position” revealed no significant differences towards how training should be provided.

Figure 5. Types of Training for Particular Skills (n=226) (1(Not Important)-5 (Extremely Important)rating)

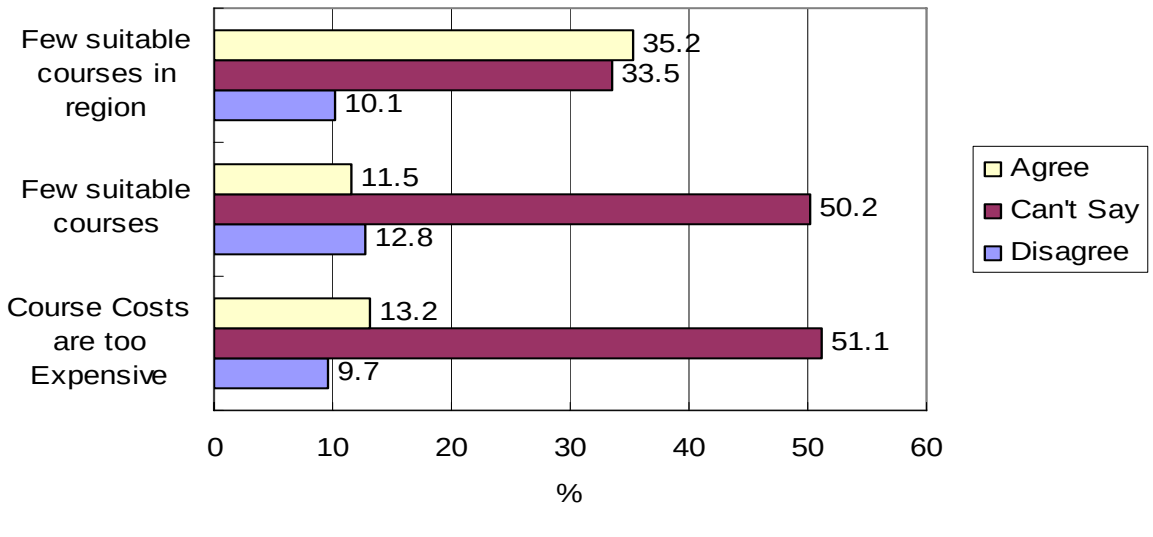


		OJT	Training			OJT	Training
Intellectual Property				**Information**			
A	Patent Application	4.4	3.9	J	Collection and Analysis	4.2	3.8
B	License Agreement Draft	4.2	3.9	K	Presentation/Publication	3.9	3.6
C	License Marketing	4.3	3.7	L	Databases	3.8	3.7
Collaborative/Contract Research				**Other**			
D	Locating Collaborative Research Seeds	4.3	3.3	M	Leadership	4.2	3.3
E	Research Contract Negotiation	4.5	3.4	N	Communication with Industry	4.5	3.2
F	Research Contract Drafting	4.2	3.7	O	Communication with Univ. Inventors	4.4	3.2
Venture Business Support				P	Technology Evaluation	4.3	3.9
G	Venture Establishment	4.1	3.6	Q	Budget Management	3.9	3.5
H	Introducing Finance	3.8	3.5				
I	Planning or Business Models	4.0	3.8				

Source: Survey Results

Respondents where then requested to reflect on factors related to training course provision. Here, respondents were offered three response categories which concerned costs of training, the suitability of courses and the availability of courses in their region. The results are presented in Figure 6.

Figure 6. Factors Relating to University-Industry Links Course Provison



Source: Survey results

In most cases it was difficult for respondents to answer this question with 51.1% and 50.2%

stating that they "could not say" about course costs and number of available courses. On the other hand, 35.2% stated that they could agree with the statement that there too few suitable courses in the region. By region, Kyushu, Hokkaido and Tohoku areas face the greatest difficulties in course availability within the region. This was not felt to be an issue in the Kanto region.

6. Important Issues over the Next Ten Years

In two open text questions (Q11 and Q12), comments were invited on how the profession is anticipated to develop over the 2007 to 2017 period. This open text response question received 175 responses, raising a number of points which can be broadly divided into the following categories:

a) Recruitment of Personnel within <35 age group

Points raised in relation to employment covered a number of different strands but one of the most prominent was that of the recruitment and retention of younger personnel (n=29). While older staff may have greater experience and can provide support to younger personnel, the overall skew towards older staff may have implications for the long term sustainability and knowledge base of university-industry links in Japan This issue was seen as "urgent business" by one respondent, and the number of mature participants was felt to be too numerous.

Others noted that at present levels, the sustainability of university-industry links is threatened due to the seniority of current staff; while others feared that the decline in popularity of engineering as a subject of study would make it more difficult to recruit younger personnel in the future. A special fee for supporting coordinators alongside current funding was seen as necessary by some respondents. In some responses the issue of younger personnel was linked clearly with issues surrounding internationalization, covered in point b.

b) Longer Contracts

Some of the issues related to contract duration and short term contracts were overwhelmingly seen in a negative light with a number of respondents indicating that these complicated employment patterns and hindered the accumulation of knowledge within the institution (see also: Noguchi in Tayanagi 2007: 10). In short, they were a source of instability undermining the attractiveness of the profession. Some suggested that 5 year contracts be introduced.

c) More International Links and Networks

Internationalization was mentioned by 28 respondents and covered issues such as developing relations with firms and universities overseas, human networks, the ability to work and draft contracts and agreements in English as well as greater abilities and training in English[20].

d) More General Training

Other training issues were raised by 25 respondents. The types of issues raised here related to the ability to frame issues and move towards the results stage, the necessity of developing fundamental knowledge on technologies, finance, law, IP, and management, the ability to work with different types of companies such as large, SME and ventures, the ability to move beyond introduction of technologies to coordinated negotiation, the

[20] See the 2007 Intellectual Property Strategic Plan where support funds for international patenting are discussed (Cabinet Office 2007: 28).

nurturing of business type thinking for those that lack private sector experience. While there is a general preference for OJT, some respondents suggested that there was currently not enough use of OJT within institutions, complicated by factors explained in relation to point A.

e) Evaluation of Personnel and Technologies

This was raised by 17 respondents and the issues covered how to evaluate personnel directly involved in university-industry relations, and more broadly in how to evaluate faculty. Some pointed in particular to evaluation of younger personnel but this was placed as a question rather than prescription of clear systems. Linking this with incentives was noted by some.

7. Conclusion

This brief paper began noting that the more general literature on human resources has observed the importance of the use and exploitation of training in enhancing employee productivity. Recent studies of university-industry links have generally supported the notion that the length of experience and training might be of importance in shaping performance. While the United States saw the technology transfer profession emerge over a course of decades, with significant spurring-on from the Bayh-Dole Act in the early 1980s; Japan, by contrast, has seen the need and development of its university-industry personnel emerge largely in response to government policies introduced since the late 1990s which is a considerably shorter time frame. This has placed strains on human resource supply, on an already limited university management capacity as well as tested the regulatory structures governing employment transfer and the avenues and organizational capacity for training. It is therefore unsurprising that debate has emerged surrounding the needs and requirements of personnel involved in university-industry links.

The review of earlier studies of university-industry links in Japan suggested that that there was currently some debate surrounding both the viability of university-industry links in Japan, and in particular, personnel issues. These issues were identified as a lack of people with sufficient skills related to intellectual property, a short-term contract basis that has limited the ability of institutions to accumulate skills, and the necessity of a diverse range of skills. However, it appears that Japan has not been alone in these debates, and both academic papers and commentary in the UK suggest that a similar experience has occurred. That is, skill shortages and lack of experience were noted, resulting in a growth of training opportunities. As the expansion of these courses has only been introduced over recent years, it is still too early to judge the influence of such training upon the performance of university licensing.

In general, very little training has occurred for Japan's technology transfer personnel. Overall, there are only a few areas where personnel feel that they lack sufficient skills and these related in the main to license marketing, and database use, as well as venture business related issues, which could reflect biases in the sample frame. With regard to training needs, preference is given to on-the-job training rather than the use of specific courses. While a number of courses are in place there do not appear to be any major barriers such as prohibitive course fees or lack of courses; although there may be issues surrounding course provision in the regions. This research has found that the age profile of personnel tends to be quite high, especially when compared with the UK. Most personnel have been educated at university level, with engineering being the most popular disciplinary background amongst staff. Also through comparison with the UK, it was observed that the contract basis in Japan does indeed appear to be relatively short and around half of staff are on a term-based rather than

permanent basis. Perhaps due to this contract basis or the length of time formal university-industry links has been promoted in Japan, the length of experience working in university-industry links has mostly been less than five years. This is also shorter than that in the UK.

There are a number of issues facing the profession over the next ten years and it is difficult to obtain optimism from many respondents. In particular there is concern over the lack of stability in the contract base which acts as a disincentive for training, compounded further by a body of personnel that are nearing retirement. At the same time that there is concern over the stability of the profession, there is also interest in broadening the current range of skills towards a more international direction, which may present a number of opportunities for course providers or those interested in enhancing their OJT activities. A further issue regards the evaluation of personnel, which many noted to be of concern over the next ten years. While this concern over the stability and viability of the profession exists, it is difficult to outline or suggest policy recommendations regarding course development due to the wastage that may arise should such courses be introduced. The main policy issues would therefore be to provide greater security to those employed in university-industry links through an extended contract base or through providing a system whereby there is clear evaluation criteria and scope for renewal within shorter contracts. Once greater stability is in place, with a younger cohort of professionals, then OJT and training will become more important.

Further research is therefore desired both to assess the types of evaluation systems for university-industry links personnel in other countries. Furthermore, further research could assess how OJT is currently used within organizations and the issues that may exist. A further point that may be of interest is the career patterns of those that have worked in the university-industry profession. If there is significant turn-over within the university technology transfer sector, where do these former employees work? There could be wastage in personnel skills and knowledge, or there may be positive externalities where these people go and work in other related sectors.

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Appendix

English Version of Questionnaire

（秘） Reference Number: _____

A Survey Concerning Training for Personnel Involved in University-Industry Relations

Ministry of Education, Culture, Sports, Science and Technology

National Institute of Science and Technology Policy

1. This survey is for people employed in university-industry link organizations to ask questions about the profile, main organizational activities, experience of training, and the ability for current activities.
2. Only those to whom the survey was sent should complete the questionnaire.
3. The data will be used for statistical analysis with no reference to personal data.
4. Please return this questionnaire in the enclosed envelope by 28 February.
5. A copy of the Survey findings will be provided to respondents
6. If there are any points on which further clarification is sought, please contact us at the address below

〒100－0005 Tokyo-to, Chiyoda-ku, Marunouchi 2－5－1 MEXT Building 5th Floor
Ministry of Education, Culture, Sports, Science and Technology
National Institute of Science and Technology Policy, Second Research Group
Responsible Person: Dr Lee Woolgar E-Mail: woolgar@nistep.go.jp

Organization Name	
Address	〒 Telephone：
Respondent Particulars	Section： Position： Name： E-mail：

Ⅰ. Your Profile

Q1. Please indicate your age by selecting from the following categories.

① 20-25		② 26-34		③ 35-44	
④ 45-54		⑤ 55-64		⑥ Over 65	

Q2. Please indicate your current employment form.

①. Secondment/dispatched from another organization
②. Attached Solely to present organization ⇒ Please go to Q2

Q２a. For those staff that selected No. 2 in Question 2, regarding your current job, is this a set term? Please select from the following.

①. Not set term
②. Set Term (within 1 year)
③. Set Term (1-2 Year term)
④. Set Term (2-5 year term)
⑤. Set Term (over 5 years)

Q3. How long have you been employed in your current work?

①. Less than 1 Year
②. 1-2 Years
③. 2-5 Years
④. Over 5 Years

Q4. Regarding your final education, please select from the following categories.

①. High School
②. Technical School/Junior College → Please go to Q6.
③. University
④. Graduate（Masters） → Please go to Q5
⑤. Graduate（Doctoral）

Q5. Regarding your final education, what was your specialist field?

①. Medicine/Pharmacy…… ☐
②. Agriculture …… ☐
③. Engineering …… ☐
④. Natural Science …… ☐
⑤. Social Science
5.1 Commerce/Economics ☐
5.2 Law …… ☐
5.3 Other Social Science…… ☐
⑥. Humanities …… ☐
⑦. Other …… ☐
(Please write specifically : _____)

Q6. From the list below, please indicate your employment experiences.

① Private Company
a. Finance…… ☐
b. IP related … … … … … … ☐
c. Production Management …… ☐
d. Marketing・Sales …… ☐
e. Research Activities …… ☐
f. Other …… ☐

② University
g. Teaching/Research…… ☐
h. Technological Support Activities … ☐
i. Administration …… ☐

③ Administration
j. National Government …… ☐
k. Regional Government…… ☐

④ Other …… ☐
(Please write : _____)

Q7. Since you began your current work, have you undertaken any specialist training related to university-industry links?

①. Yes ☐ ⇒Please go to Q7a
②. No ☐

Q7a. Where did you receive your training in university-industry links?

① Japan ☐
（Please write name of Organisation：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿）
② Overseas ☐
（Please write name of Organisation：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿）

II. Your Current Work

Q8. Regarding the following university-industry activities, do you feel that your current skills are sufficient?

	Sufficient	Not Sufficient	Not Relevant
① Patents and Licensing			
a. Patent Application	1	2	3
b. Drafting Licensing Agreements	1	2	3
c. License Marketing	1	2	3
② Contract or Collaborative Research			
d. Searching for Contract or Collaborative Seeds	1	2	3
e. Negotiation of Contract or Collaborative Contracts	1	2	3
f. Drafting Contract & Collaborative Contracts	1	2	3
③ Venture Business Support			
g. Establishment Support	1	2	3
h. Introduction of Finance	1	2	3
i. Planning/Business Model Development Support	1	2	3
④ Information Activities			
j. Information Analysis	1	2	3
k. Presentation of Information	1	2	3
l. System Management （database management）	1	2	3
⑤ Other Abilities			
m. Leadership	1	2	3
n. Communication with Industry	1	2	3
o. Communication with University Inventors	1	2	3
p. Technology Evaluation	1	2	3
q. Budget Management	1	2	3

Q9. Regarding university-industry training courses (for instance, courses by the Japan Institute of Invention and Innovation, the Japan Association of New Business Incubation Organizations etc.) what do you think?

	Not the Case	Can't Say	Agree
a. Course Costs are too High	1	2	3
b. Too few suitable courses	1	2	3
c. Lack of suitable courses in this region	1	2	3
d. Other (Please explain：)			

Q10. With regard to the university-industry activities below, how would you like to acquire these skills, either through OJT (training whilst at work) or through the use of specialist courses?

	OJT					Training Courses				
	Not Important		←→		Extremely Important	Not Important		←→		Extremely Important
① Patents and Licensing										
a. Patent Application	1	2	3	4	5	1	2	3	4	5
b. Drafting Licensing Agreements	1	2	3	4	5	1	2	3	4	5
c. License Marketing	1	2	3	4	5	1	2	3	4	5
② Contract or Collaborative Research										
d. Searching for Contract or Collaborative Seeds	1	2	3	4	5	1	2	3	4	5
e. Negotiation of Contract or Collaborative Contracts	1	2	3	4	5	1	2	3	4	5
f. Drafting Contract & Collaborative Contracts	1	2	3	4	5	1	2	3	4	5
③. Venture Business Support										
g. Establishment Support	1	2	3	4	5	1	2	3	4	5
h. Introduction of Finance	1	2	3	4	5	1	2	3	4	5
i. Planning/Business Model Development Support	1	2	3	4	5	1	2	3	4	5
④ Information Activities										
j. Information Analysis	1	2	3	4	5	1	2	3	4	5
k. Presentation of Information	1	2	3	4	5	1	2	3	4	5
l. System Management（database management）	1	2	3	4	5	1	2	3	4	5
⑤ Other Abilities										
m. Leadership	1	2	3	4	5	1	2	3	4	5
n. Communication with Industry	1	2	3	4	5	1	2	3	4	5
o. Communication with University Inventors	1	2	3	4	5	1	2	3	4	5
p. Technology Evaluation	1	2	3	4	5	1	2	3	4	5
q. Budget Management	1	2	3	4	5	1	2	3	4	5

Q11. Regarding university-industry personnel, what sort of important issues do you think there will be over the next ten years? Please write your opinion in the box below.

Q12. Regarding university-industry personnel, if you have any further opinions please write them in the box below.

Thank you very much

Japanese Version of Questionnaire

（秘）　　整理番号＿＿＿＿＿＿

産学連携人材の育成に関する調査

文部科学省　科学技術政策研究所

１．本質問票は、産学連携機関で活動されている方のプロフィール、ご所属機関における活動内容、研修のご経験、および必要とされる職能に関する質問で構成されています。

２．ご回答は本調査票送付先宛名のご本人にご記入頂けますよう、お願いいたします。

３．ご回答頂いた調査票は統計的に処理し、個別情報は一切外部に公表致しません。

４．ご回答頂きました調査票は、同封の返信用封筒にて２月２８日までにご投函下さい。

５．ご回答頂きました方には、後日、集計結果の概要をお送りいたします。

６．設問の内容に不明な点がございましたら、下記までお問い合わせ下さい。

〒100－0005 東京都千代田区丸の内 2－5－1　文部科学省ビル５階

文部科学省科学技術政策研究所　第２研究グループ　担当：リー・ウルガー

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機　関　名	
住　所	〒
回答者御氏名	部署：　電話： ご氏名：　お役職： E-mail：

（『集計結果の概要』は、上記宛でお送りいたします）

Ⅰ．ご自身のプロフィールについて

問 1. あなたの年齢について、該当するものに〇をお付け下さい。

① 20～24 歳		② 25～34 歳		③ 35～44 歳	
④ 45～54 歳		⑤ 55～64 歳		⑥ 65 歳以上	

問 2. あなたの現在の雇用形態として該当するものに〇をお付け下さい。

①. 他の機関からの出向・派遣
②. 所属機関の専属スタッフ ⇒ 問 2－補問にお進み下さい

<u>問２－補問</u>. **問２で２.専属スタッフとお答えされた方にお聞きいたします。現在の職は、任期付でしょうか。下記の選択肢から該当するものをひとつだけ選び、〇をお付けください。**

①. 任期付ではない
②. 任期付である（１年未満）
③. 任期付である（１年～２年未満）
④. 任期付である（２年～５年未満）
⑤. 任期付である（５年以上）

問 3. 現在の職務に就いてからの期間で該当するものを選び、〇をお付けください。

①. １年未満
②. １年～２年未満
③. ２年～５年未満
④. ５年以上

問 4. あなたの最終学歴について、該当するものに〇をお付け下さい。

①. 高等学校
②. 専門学校・短期大学 → 問６にお進み下さい
③. 大学
④. 大学院（修士）
⑤. 大学院（博士） → 問５にお進み下さい

問 5. 最終学歴における、あなたの専門分野は何ですか。下記の中から該当するものを選び、〇をお付け下さい。

①. 医学・薬学 …… □
②. 農学 …… □
③. 工学 …… □
④. 理学 …… □
⑤. 社会科学
5.1 商学・経済学 …… □
5.2 法学 …… □
5.3 その他の社会科学 …… □
⑥. 人文科学 …… □
⑦. その他 …… □
（具体的にお書きください：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿）

問 6. あなたは以下の職務経験がありますか。当てはまる職務全てに〇をお付け下さい。

① 民間企業
a. 財務 …… □
b. 知的財産関連業務 …… □
c. 生産管理 …… □
d. マーケティング・販売 …… □
e. 研究開発 …… □
f. その他 …… □

② 大学
g. 教育・研究 …… □
h. 技術的支援業務 …… □
i. 事務 …… □

③ 行政
j. 国の行政 …… □
k. 地方自治体の行政 …… □

④ その他 …… □
（具体的にお書きください：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿）

問7. 現在の仕事に就いた後で、産学連携の活動に関する特別な研修を受けましたか。

①. はい □ ⇒ 問７ー補問にお進み下さい
②. いいえ □

問 7－補問. 産学連携活動に関する研修はどこで受けましたか？　該当するものに〇をお付け下さい。

① 日本 ☐
（研修実施機関の名称：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿）
② 海外 ☐
（研修実施機関の名称：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿）

II. 現在の職務について

問 8. 産学連携の活動に関する下記の業務について、あなたは現在、十分な職能をお持ちですか。該当する番号に〇をお付け下さい。

	十分	不十分	担当業務ではない
① 特許・ライセンス			
a. 特許出願	1	2	3
b. ライセンス契約文書の作成	1	2	3
c. ライセンスマーケティング	1	2	3
② 受託・共同研究			
d. 受託・共同研究のシーズの探索	1	2	3
e. 受託・共同研究契約の交渉	1	2	3
f. 受託・共同研究契約書の作成	1	2	3
③ ベンチャー起業支援			
g. 設立支援	1	2	3
h. ファイナンスの紹介	1	2	3
i. プランニング・ビジネスモデル作成支援	1	2	3
④ 情報活動			
j. 情報収集分析	1	2	3
k. 情報開示（広報等）	1	2	3
l. システム運営（データベース管理等）	1	2	3
⑤ その他の職能			
m. リーダーシップ	1	2	3
n. 企業担当者とのコミュニケーション	1	2	3
o. 大学の発明者とのコミュニケーション	1	2	3
p. 技術評価	1	2	3
q. 予算管理	1	2	3

問 9. 現在、産学連携の研修コース（発明協会、日本新事業支援機関協議会等によるもの）について、どのようにお考えですか。該当する番号に〇をお付け下さい。

	そんなことはない	どちらともいえない	その通り
a. コース費用が高すぎる	1	2	3
b. 適切なコースが少ない	1	2	3
c. 適切なコースがこの地方では開催されていない	1	2	3
d. その他（具体的にお知らせ下さい：			）

問 10. 産学連携に関する下記の職能を獲得する上で、ＯＪＴ（仕事につきながらの訓練）と研修コースの利用は、どの程度重要だと思いますか。ＯＪＴと研修コースのそ

れぞれについて、該当する番号に○をお付けください。

	O J T					研修コース				
	重要ではない		←→		きわめて重要	重要ではない		←→		きわめて重要
① 特許・ライセンス										
a. 特許出願	1	2	3	4	5	1	2	3	4	5
b. ライセンス契約文書の作成	1	2	3	4	5	1	2	3	4	5
c. ライセンスマーケティング	1	2	3	4	5	1	2	3	4	5
② 受託・共同研究										
d. 受託・共同研究のシーズの探索	1	2	3	4	5	1	2	3	4	5
e. 受託・共同研究契約の交渉	1	2	3	4	5	1	2	3	4	5
f. 受託・共同研究契約書の作成	1	2	3	4	5	1	2	3	4	5
③ ベンチャー起業支援										
g. 設立支援	1	2	3	4	5	1	2	3	4	5
h. ファイナンスの紹介	1	2	3	4	5	1	2	3	4	5
i. プランニング・ビジネスモデル作成支援	1	2	3	4	5	1	2	3	4	5
④ 情報活動										
j. 情報収集分析	1	2	3	4	5	1	2	3	4	5
k. 情報開示（広報等）	1	2	3	4	5	1	2	3	4	5
l. システム運営（ﾃﾞｰﾀﾍﾞｰｽ管理等）	1	2	3	4	5	1	2	3	4	5
⑤ その他の職能										
m. リーダーシップ	1	2	3	4	5	1	2	3	4	5
n. 企業担当者とのコミュニケーション	1	2	3	4	5	1	2	3	4	5
o. 大学の発明者とのｺﾐｭﾆｹｰｼｮﾝ	1	2	3	4	5	1	2	3	4	5
p. 技術評価	1	2	3	4	5	1	2	3	4	5
q. 予算管理	1	2	3	4	5	1	2	3	4	5

問 11. 産学連携の人材育成において、どのような課題が今後１０年間で重要になると思いますか。 ご自由にお書き下さい。

問 12. 産学連携人材の育成に関して、この他にご意見、ご感想がありましたら、ご自由にお書き下さい。

ご協力誠にありがとうございました。