

出國報告（出國類別：其它-參訪交流）

赴日出席與 JST 合辦之產學合作研討 會及會後參訪

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摘要：

2015 年 3 月 9 日-13 日，科技部(以下簡稱本部)與日本科學技術振興機構(Japan Science and Technology Agency, JST)在東京 JST 舉辦「產學合作研討會」，由本部科教國合司周倩司長率團赴日出席，JST 由伊藤宗太郎(Sotaro ITO)執行役擔任日方團長，台日雙方各由 7-8 位學者專家發表簡報。在研討會結束後，由 JST 安排參訪產業技術總合研究所、東京大學產學連攜部及筑波的 Cyberdyne Company.

壹、目的

2015 年 3 月 9 日至 13 日，本部與日本科學技術振興機構 (Japan Science and Technology Agency, JST)舉辦「產學合作研討會」，旨在支援科學研究外，探討縮短學用落差並將學研成果應用至產業，以推升經濟發展的課題。台日在產學發展，各有不同的問題和策略。本次雙方講演簡報的學者專家，皆是在產學相關議題領域負責規劃或執行的主管和代表，對於產學合作的見解，有豐富的實務經驗。本次研討會交流，讓與會人員以產官學研的角色，分享台日產學合作的作法，評析趨勢，對於推動國際產學和技術研發的合作，俾收他山之石之效。

貳、過程

■主要行程/

1.本部(MOST)與日本獨立行政法人科學技術振興機構 JST 舉辦 產學合作研討會

本部與日本JST在日本東京Hotel Monterey Hanzomon舉辦以產學合作為主題之雙邊研討會，由本部科教國合司周倩司長率團出席，JST由伊藤宗太郎執行役率團主持。本項研討會係依本部與日本JST年度工作會議決議舉辦，由JST負責規劃籌辦，台日各由7-8位講員簡報產學合作相關議題。

研討會開幕由 JST Sotaro ITO 代表主辦單位致歡迎詞，台方由周倩司長代表致詞。研討會的首場主題演講由 JST 理事長顧問 Dr. Hiroyuki Abe 發表題為“Trends in University’s IP Strategy, and a Vision for the Future”。隨後上半場的第一場簡報由 JST 產學合作部的 Manager Dr. Tetsuya Ito 發表“Support and Funding Programs for Industry - Academic Collaborative R&D”。第二場由本部產學及園區業務司許增如副司長發表“ The “Society-Engaged” Cooperation Strategies and Practices between Academia and Industries in Taiwan”。第三場由日本物質.材料研究機構(NIMS)的 Section Manager Dr. Akio Hitachi 發表“Industrial Collaboration and Technology Transfer at NIMS”。第四場由台灣科技大學恒勇智研發長發表“An innovation Driven Triple Helix Cooperation at NTUST (Taiwan Tech)”。下半場研討會進行第二場主題演講，由國家實驗研究院余日新營運長發表“Ever-Changing Nature and Public Policy of academia-Industry Collaboration in Taiwan”。下半場第一場簡報由東京大學研究管

理中心 Dr. Yoshito Koga 發表”Industry – Academia Cooperation Activities at Tokyo University of Science”。第二場簡報由逢甲大學創新創業中心顏上詠主任發表”Collaboration of Enterprise and University – Challenge, Strategy, and Future”。第三場簡報由東北大學合作研發辦公室 Prof. Hachizo Mawaki 和召集人 Mr. Akihisa Matsuno 發表”Industry-University Collaboration Activities at Tohoku University”。第四場簡報由中原大學陳夏宗副校長發表” Establishing Innovation and Entrepreneurship Ecosystem for Promoting Industry-Academia Cooperation at Chung Yuan University”。第五場簡報由名古屋大學 Prof. Yoshimasa Goto 發表”Blue-LEDs Innovating the World : a Case of Industry-Academia Collaboration in Japan”。第六場簡報由清華大學張晃猷副研發長發表” Fostering Biotechnology in National Tsing Hua University - Current Approach and Perspective”。第七場簡報由 JST 的產學合作部 Manager Go Kato 發表 ”The Situations of University-Oriented Start-Ups in Japan”。第八場簡報由成功大學蔡明祺講座教授發表”Industry-Academic Collaboration to Innovative Startups”。第九場簡報由 Dr. Iwao Yoshino ,CEO, Chairman of the Board, Microwave Chemical Co., Ltd.發表” Starting up a Company – Our Case”。

研討會閉幕前由 JST 的 Dr. Hiroyuki Abe 及台灣科技大學恒勇智研發長代表台日雙方進行總結報告。晚間則由 JST 舉辦懇親會歡迎晚宴，結束當日研討會行程。

2. 拜會東京大學產學合作部

JST 安排訪團拜會東京大學產學合作部，由推進部長各務茂夫接待，並由岡本明彥博士和研究員李旻報告東京大學的產學作法。李旻研究員是中國留學日本學成之後留下工作，此種模式在過去參訪日本的大學中，屢見不鮮。和台灣一般學校相較，該校產學的架構與整體執行方式較為鬆散，工作人員為數不多；惟東京大學的研發本屬世界一流，且已法人化，其產學作法具高度彈性，整體執行效率非常高，亦獲得日本政府最大比例的研發投資，產出包含新創公司的數目，技轉金的金額也極為亮麗。

3. 拜訪日本產業技術總合研究所(National Institute of Advanced Industrial Science and Technology, AIST)

AIST 是一龐大且國際化的研究機構，包含 2255 位研究人員和訪問學者，AIST 注重高品質的應用科技研發，和台灣許多機構也有密切來往。本次參訪，AIST 由國際部酒井夏子部長向訪團簡報，簡報內容主要是有關 Green Technology(如能源、新資源及環境議題)及 Life Technology(健康照護、安全生活、藥物開發與相關儀器、生物標誌、微晶片與醫療診斷等)研發議題，研究對日本社會民生等問題的解決方案。

簡報後參訪 2 個實驗室，一個由 Atsushi Yamamoto 博士主持，主要從事熱電元件與測定儀器的開發。在實驗室展示了只要些微溫度改變即可讓風扇持續轉動的元件，以及精密的 3D 溫度掃描儀，在物體溫度測定相當重要。另一實驗室為

普魯士藍奈米高分子的製作與應用，此種材料可以製成薄膜，並以電流控制結合的金屬種類以改變顏色，可以應用於控制各種採光設施透光程度，以及所吸附的波長。另外此材料可以用於吸附放射線 Cs 同位素，在水質淨化上有高度應用性。整體而言，此二實驗室的構想都具有高度的新創性，使用目的也非常環保，是適合台灣參考的模式。

4. 拜訪筑波大學Yoshiyuki Sankai教授創業 Cyberdyne Inc.

Cyberdyne 公司是由筑波大學 Yoshiyuki Sankai 教授所創，主要提供人體工學輔具的設計與生產，應用甚廣。在去年成為上市公司，技術由筑波大學引進，也持續和大學有很多合作，是產學合作與技術移轉極佳的模式。Prof. Sankai 向訪團進行簡報，他提到從二十多年前就立志要藉所學解決民眾的切身問題。他說每年都可以發表論文、申請專利，但都迴避那種誘惑，將時間專注在持續地研發，直到研究出關鍵技術。他申請了所有的專利保護，也積極參與並主導相關 ISO 該項產品國際標準規範。他做的不只是新創一家公司而是新創一個產業，非常值得國內各大學研發衍生參考。Cyberdyne 公司目前的產品是以減輕照護病人的護理人員及家人的體力負擔為主，也擴展至其他產業，諸如搬運業。Cyberdyne 公司技術最特別的是人機介面的部分，可以用意念去控制機械裝置，所以對於失去運動功能的神經退化性病人也會有很大的幫助。該公司也實際展出包括在小兒痲痺症病人的實際應用。另有:Robot Suit, Hybrid Assistive Limb。Prof. Sankai 年來得獎無數，包含：Entrepreneur of the Year Japan 2010。

參、心得及建議事項

本次研討會 JST 特別邀請一位創業已獲得初部成功進展的吉野巖 (Iwao YOSHINO) 博士報告。吉野巖博士的公司 Microwave Chemical 是利用微波產生能源轉換材料成高價化學品。利用微波產生能源的做法相當環保。吉野巖博士創業的歷程艱辛，尤其是在日本重化產業鏈中，其做法是顛覆形類，但也更具長遠影響效益。

我方的簡報從科技部對於國家政策面的說明、國研院余營運長介紹執行面的整體推動機制、台灣科技大學的 Triple Helix(三股螺旋)概念、中原大學的多元推廣、逢甲大學對智財技轉的經驗、成功大學對醫材創業的實際案例，以及清華大學在生物技術創業的創新作法，都引起會眾很高的興趣，並提出許多問題交流。

本部與日本科學技術振興機構(JST)在日本東京舉辦的產學合作研討會，在選擇主題方面有特殊意義。過往兩方年度研討會都以學術研究主題為宗，今年是第一次以產學合作為研討會主題。反映台日兩國都逐漸將科技研發成果對產業、社會大眾的回饋以及正向衝擊列為重點。

肆、附錄(簡報摘要)

<u>Name of Presenter</u> Peter J. Sher
<u>Presentation Title</u> Ever-Changing Nature and Public Policy of Academia-Industry Collaboration in Taiwan
<u>Abstract :</u> Academia-Industry collaboration in Taiwan evolved over time since the promulgation of Basic Science and Technology Act in 1999. Ministry of Education, Ministry of Economics Affairs, and National Science Council (Ministry of Science and Technology since March 2014) team up under the coordination of Board of Science and Technology, Executive Yuan to facilitate the process in the last 15 years. Policy governed by different ministries focused on a variety of dimensions that intend to bridge academia and industry, including human resources, research and development, industrial impacts and international competitiveness. Specifically, along the process of transformation from National Science Council, the primary academic R&D funding organization, into Ministry of Science and Technology, a more comprehensive coverage along the spectrum from basic research to commercialization. Advisory Board and Working Group of Academia-Industry Collaboration are formed under the first S&T Minister San-cheng Chang (current Vice Premier) to expedite progress of the prominent start-up policy. Closer international connection, especially with Silicon Valley, and focused industrial dedication such as bio-technology, internet of things, advanced manufacturing and broadband mobile communication are set as strategic priority. National Development Council joins the aggregated policy promotion of start-up economic development recently. Joined resource endowment from university, research institutes and firms propels the momentum of academia-industry collaboration to another level.

Name of Presenter

Andrea Tseng-Ju HSU

Deputy Director General, Department of Academia-Industry Collaboration and Science Park Affairs, Ministry of Science and Technology

Presentation Title

The “Society-Engaged” Cooperation Strategies and Practices between Academia and Industries in Taiwan

Abstract :

Establishing communication and cooperation between enterprise and academia is a common problem all over the world. Academia cares about advanced technology, academic research and research publications. On the other hand, enterprises care about mature technology, short-term profit and market competition. The different points of view make cooperation between academia and enterprises difficult.

After organization restructuring in March 2014, Ministry of Science and Technology (MOST) emphasizes more in facilitating "technology innovation" to strengthen the linkage between scientific research results and industrial development and commercialization. MOST will work out with the Ministry of Economic Affairs, Ministry of Education and other relevant Ministries together. To achieve this goal, MOST has three strategies: to require research outputs should be “society engaged” and have positive impacts on human economy or society. Secondly, to strengthen industry-academia linkages so that scholars and researchers will realize the real demands from industry and encourage more demand-driven innovations and R&D activities. Lastly, to cultivate research talents for enterprises and graduates will also be effectively employed.

In order to achieve the above strategies, MOST has a number of special programs. For example, Academia-Industry Cooperation Project for Pioneering Technology (Major Academia-Industry Alliance) led by the flagship enterprises in Taiwan and aims at the technology-competent status in the international market. Academia-Industry Technology Alliance Program (Minor Academia-Industry Alliance) led by academia and targets on the domestic enterprises to upgrade their technology. Linking Industry to Academia by Leveraging R&D Organizational Capacities Project attempts to systematically excavate practical and potential research results and patents, add extra value to the technologies and then transfer them to the industry. The Pilot Project of Joint Sponsorship between Academia and Industry for the Ph.D. Student Incubation hopes to introduce corporate funds to sponsor outstanding doctoral graduates. Moreover, MOST adopt a number of new programs such as Germination Programs and From IP to IPO (FITI) to encourage young startups from school, which provides prospective policy resources to start up a company. In addition, MOST also actively build ecosystem and sound environment for the new startups, in order to provide incentives to attract the academia engaging in industrial applications.

Name of Presenter

Yong-Chie Heng

Presentation Title

An innovation driven triple helix cooperation at NTUST (Taiwan Tech)

Abstract :

The university is responsible for nurturing and preparing its students for the society and industry. As such, the university plays a pivotal role in the joint innovation activities among industry, university and government, the so called triple helix cooperation.

National Taiwan University of Science and Technology (Taiwan Tech) is devoted to providing an innovation environment in its university campus and to induce traditional teaching and research functions further to the stage of entrepreneurship and start-up. Under the Office of Research and Development leadership, the General Affairs Center, Technology Transfer Center, Business Incubation Center and Industry Service Center work together to achieve the above objectives.

The unique Industry-University Cooperation Center of Taiwan Tech entrusted by the Ministry of Education (MOE) leads the Northern Technological and Vocational Major League to leverage strengths of its twenty-one partnership universities to achieve greater compound effects.

Under the guidance of MoE and MoST, Taiwan Tech takes a pro-active role in sharing its R/D patents and technology know-how with the local industry. In return, Taiwan Tech is able to stay closer to the market requirements and also obtains sponsored thematic research projects from the companies. Triple helix cooperation, in this context is driven by industry focused innovation needs and its result brings multi-wins.

Name of Presenter

Shia Chung Chen

Presentation Title: Establishing Innovation and Entrepreneurship Ecosystem for Promoting Industry-Academia Cooperation at Chung Yuan University!

Abstract :

Founded in 1955, Chung Yuan Christian University (CYCU) is a leading school in high education, particularly focusing its research for industrial applications in Taiwan. CYCU advocates innovation and creativity, placing importance on connecting with industry demands. EOCIA (Executive Operation Center for Industry-Academia Cooperation) is one of the important centers in CYCU, which actively integrates academia/industry/government resources and provides many value-added services to industries and universities. EOCIA protects, mines and commercializes R&D results. It has become an excellent connecting bridge between the industry and the academic field. There are several sub-centers and offices under EOCIA, namely "Entrepreneurship & Technology Licensing Center", "Innovation & Incubation Center", "Germination Center", "Creative Innovation & Entrepreneurship Office" and "Innovation & Entrepreneurship Rooted Center". Through the operation of these sub-centers, CYCU has established a complete education programs for creativity, innovation and entrepreneurship. The program has been strongly linked to experience enterprise persons. EOCIA helps the practice teams for entrepreneurship operation simulation and competition with the aid of patent analysis and implementations, industry opportunity analysis, business model analysis, venture capital matching and even international integrated counseling. For commercialization-potential technology EOCIA also assists the relevant teams to obtain angel fund and/or germination research fund through a strict review process. For many years' operation EOCIA combines the key factors of Industry and Academia link from internal to external as well as various funding channels resulting in a complete ecosystem. In recent years, EOCIA also accelerates promotion of potential incubates, SMEs, research results, upgrade of industrial technology, and carry out international corporation between industry and academia and achieve a knowledge-based innovation and entrepreneurship model university.

EOCIA has also launched International incubation since 2006. It has established 6 co-incubation centers and 12 strategic partners in different countries. EOCIA provides integrated services and will take action to promote and connect business opportunity and possible cooperation overseas hoping to create industry-academic blue sea in the future.

Name of Presenter

Chang, Hwan You

Presentation Title

Fostering Biotechnology in National Tsing Hua University - Current Approach and Perspective

Abstract :

Located in the major high tech zone of Taiwan, National Tsing Hua University (NTHU) has been one of the leading R&D centers contributing to economic success of Taiwan. The university has around 650 faculty members and 12,000 students, half of them are in graduate levels. The education of entrepreneurship at NTHU starts early and rooted even in students' residential activities. Without a medical school and a teaching hospital, the Biomedical Research Center is responsible for coordinating Bio-X research on the campus. The Operation Center for Industry Collaboration (OCIC), consisting of Division of Industrial Collaboration Administration, Division of Intellectual Property and Technology Licensing Germination Functional Unit, and Innovative Incubation Center, is in charge of planning and coordinating the research power and resources of the university to generate social impacts. Services ranging from idea exploration, prototype production, to startup company formation are all covered by OCIC. To pave the way to meeting the needs of clinical trials, the university established an IRB office on campus and provides funds for faculty members to establish research collaboration with physicians in four major medical centers in Northern Taiwan. In these commercialization processes, NTHU alumni play a pivotal role by sharing experience and connecting the startup teams to angel and venture capital funds. For those teams which would like to extend their business globally, the OCIC will assist them to take the advantage of the incubation centers of our sister universities around the world. Finally, the new OCIC Building and the Tsing Hua Open Laboratory Building, located side by side, will be completed at the end of 2015. This new space and facility will be used by both local and international biomedical startups in OCIC to test and develop their products, as well as for accommodating certain alliances and joint-research centers between NTHU and major companies.

Shang-Yung Yen

Presentation Title

Collaboration of Enterprise and University – Challenge, Strategy, and Future

Abstract :

In this presentation, the main issues will cover the following topics such as:

- (1) Challenges to University/Student
- (2) Challenges to Enterprise/Industry
- (3) Why should university and enterprise cooperate?
- (4) Strategies from cases future Action – what should we do?

The role of university has faced numerous challenges, particularly serious impacts of low birth rate in Taiwan today. How to keep balance of exporting professional manpower? How to fulfill deep gap between academic and industrial practice? How to provide sufficient international insight to students? These all are big challenges that we have to confront in the global village. Therefore, academia and industrial collaboration has become a significant trend in Taiwan nowadays. In response to this trend, Feng Chia University has developed certain cooperation policies and strategies and spin off models. These policies and strategies will be expected to result in immense resources inputs from enterprises and governmental units and university's triangles co-operations. In additions, it will be supportive for teachers and students to start up a new company.

Name of Presenter

Mi-Ching Tsai

Presentation Title

Industry-academic Collaboration to Innovative Startups

Abstract :

National Cheng Kung University (NCKU) is a comprehensive university for advanced education and interdisciplinary research. In the past decades, considerable needs in industries were identified and further oriented research and development strategies in NCKU, and research achievements with global IP portfolio had largely closed the gap between the industry and academic. With the assistance from professional staffs of NCKU, technical service teams find out specific niche markets for the commercialization of their researches and to build startups with novel blue ocean strategy. Nowadays, from industry-academic collaboration to innovative entrepreneurship in the university, NCKU develops a new model of advanced education system in Taiwan, and influences may arise to the world. In this workshop, we will illustrate two examples in the transformation of outstanding achievements of industry-academic collaborations into startups.

Name of Presenter

Dr. Hiroyuki Abé

Presentation Title

Trends in University's IP Strategy, And a Vision for the Future

Abstract :

1. Chronology of Japan's IP Strategy

2. Current Trends and Issues

- Patent Applications
- Owned Patents
- Licensing
- Joint Research
- Sponsored Research
- Start-Ups from Universities
- Activities of JST

3. Vision for the Future

*Universities should have strategies to effectively utilize their patents particularly in focusing on the market.

*Universities should have more autonomy and responsibility for their own IP strategies and operations.