

수 있는 산학협동체제의 확립이 무엇보다도 더 요청되고 있다고 하겠습니다.

일본의 산학협동을 보면 1955년 일본 생산성본부가 산학협동체제의 도입을 강조함으로써 비롯되고 있습니다. 일본 생산성본부는 1957년 「산학협동전문시찰단」을 미국에 파견하였고 1958년에는 JPC 내에 산학협동위원회를 설치하여 활발한 조사연구활동을 전개하였습니다.

한편 일본 정부는 통산성내에 「산업합리화심의회」를 설치하여 산학협동을 제창하고 「日經聯」이 이에 호응함으로써 산학연구운동은 본격화되기 시작하였습니다. 즉 산업계에서는 1959년에 「산학협동센터」를 1960년에는 「과학기술진흥재단」을 설립하는 한편 기술자의 학교 파견연수와 해외유학 및 국내유학과 산학협동의 조정 연락을 위하여 산학협동연락사무기구의 설치등 산학협동체제의 내용을 충실히 하고 있습니다.

이러한 일본의 경험은 우리에게도 크게 참고가 되리라 봅니다. 예컨대 한국과학기술단체총연합회, 전국경제인협회, 그리고 정부가 각각 산학협동에 대한 능동적인 조치를 취할 수 있을 것입니다.

그러나 무엇보다도 중요한 것은 국내 기업의 연구 풍토를 조성

해야 된다는 것입니다. 즉 기업은 기술개발을 주요 경영 전략으로 삼고 이를 위하여 판매액에 대한 일정비율을 연구개발비로 투자한다든지 기술자의 자질향상을 위하여 과감한 산학협동체를 강구하도록 촉구하고 싶습니다.

한편으로 대학에서는 산업계의 요구에 응할 수 있는 보다 탄력적이고 현실적인 기관으로서 주어진 역할을 수행할 수 있도록 연구시설을 확보함과 아울러 응용연구에 관심을 가져주어야 하겠습니다. 미국에서는 대학에서의 응용연구가 대학전체연구비의 37%를 차지하고 있으며, 벨지움은 38%, 노웨이는 31%나 되고 있습니다.

이러한 산업계와 학계의 노력과 더불어 정부나 과학기술단체 총연합회에서나 어디서 주관하든지 간에 산학협동을 위한 실태 조사는 실시해야 되리라 봅니다. 즉 학계의 연구능력이나 기업계의 기술적 문제점을 구체적으로 세밀히 조사·분석하여 기업체 연구기관 학계의 원활한 연결을 위한 기틀을 만드는 것이 아주 바람직하다고 봅니다.

결국 산학협동의 문제는 기업과 학계 또는 정부의 일반적인 시도로서는 그 실효를 거두기 어려운 면이 많으므로 이에 대한 동원체제가 바로 산학협동의 열쇠가 되지 않을까 합니다.

Promotion of Industry Seminars & Extension Courses

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Academic universities can not afford to change the curriculums every semester to meet the changing trends, technical advancement, cross-fertilization, and the newly developing business interests. This necessitates industry and professional society cooperation to conduct industry Seminars and extension courses to keep up the progress and to start something new and to improve the existing systems.

Professional societies must be thoroughly aware of the need and necessary harmony to promote such activities. This not only advocates the new technology and communicate with the industry executives what modern technology can offer for commercialization, but also re-educates the old and less flexible talents and redirects the educators' interests as well.

Upgrading the social status of the educated engineers and scientists depends great deal upon these efforts, though the understanding by laymen is necessary what engineering and science is all about, for the improvement of modern living and economic gains.

Some detail examples are presented how this is done in USA, and suggested programs in Korea are discussed which need

support from industry and form professional societies and trade unions.

*Suggested by Dr. Kim, Dong-II

for presentation at the Korean federation of Scientific & Engrg Societies, abstract submitted on August 8th, 1972

Introduction:

Too often we hear the criticisms that there is no place for college-educated engineers and scientists in Korea. Furthermore, some people makes statements that they are "useless and socially unrecognized". This is partially educators' fault, and the some of the misguided government policies are to be blamed.

It was reported that Dr. F. E. Turman gave a talk on september 2nd, 1972 emphasizing the need for graduate school technical education, while my presentation was prepared on August 8th 1972 upon being suggested by Dr. Kim, Dong-II, and there is no direct connection with Dr. Turman's speech; the emphasis of the current presentation is about the midpoint between Dr. Turman's graduate level technical education and the skilled technician training.

No doubt, we have the latent force of technology in Korea, and it is apparent that the corporate executives want to make use of these potential technical talents. However, one must recognize the existence of the semi-permanent barrier between management and technology due to the inadequate provisions of utilizing the talents for commercialization. There is a great need for inspiring the management-technology cooperation, for exposing the provoking thoughts and ideas, and brainstorming to them, and providing digestive measures in importing foreign technical aids.

It is the purpose of the talk to present the ways and means to get recognition of ideas, in a society where utilization of technical talents is not well-exploited, and how to contribute for the advancement of engineering and science in Korea and do the utmost share to improve monetary gains in modern living.

Industry & University need cooperation. There are constant needs to regroup industry interest and exchange opinions, of course preventing the industry proprietary matters. There are avenues of teaching which a University can not afford in talent, flexibility, nobility, etc. And the program must be SELF SUPPORTING. This can best be done by "Industry Seminars & Extension Courses."

It would be very reluctant to push the unemployed college graduates into graduate school, and most of them can not defray their schooling expenses. Where could they go after graduation from graduate school? This is the reality, and one must reflect the thinkings accordingly.

Social Status of Professional Engrs & Scientists:

Aside from the problems of educating future scientists and engineers, there are confronting difficulties of the profession in Korea.

The status of professional engineers and scientists is measured and recognized by the inherent understanding in a particular society. The misunderstanding and improper recognition of the technologists must be rectified by the professionals themselves.

Frequently, automobile drivers, locomotive operators, stove pipe cleaners, welders, etc. have lead the mass public image of the technology, and white gown is not the only status symbol of the researchers. Of course, these duties must be directed and supervised, but we must take the leadership in proving the glory of modern technology, by cooperating for economic gains with technical advancement.

Even in SUA, there are slight misunderstandings because of the things they deal with, but the engineers and scientists maintain their middle and upper middle class status with their financial power. They are classified somewhere between those of accountants and medical doctors. It is known that their salaries are usually higher than those of equivalent status, and

government engineers get paid more than the industry engineers. Seldom we see professional engineers & scientists become professional politicians though there are scientists' government posts such as heads of bureaus, president's science advisors, etc. Military ranks and academic professorial ranks have a common denominator. Full professors have an equivalent rank of colonel to general while an instructor has an equivalent rank of Army captain.

Thus, Korea definitely has a problem of upgrading and correcting the misunderstandings of the status of the engineers and scientists. Admitting the fact, that the western civilization and modernization is partially responsible in bringing the social disorders in the Orient, and conducting unconstitutional surveillances without notice, and wholly responsible in making destructive nuclear weapons in over-killable quantities, we must be able to answer the ADVANTAGEOUS side of the frequently abused technology.

Status Upgrading

Engineers and Scientists in Korea have multiple tasks of taking care of themselves, correcting the misunderstandings of the public, convincing the highly damped industry executives, etc.

The following methods are some of the ways of upgrading the social status of the learned engineers and scientists

- a) Technological cost guideline is needed for services such as paid literature survey (cost per unit time), surveying, engineering drawing, advanced design, advanced consulting (investment, company policy, government advisory work, etc.) and many others.
- b) Self-improvement; keeping up with the technical advancement.
- c) Provision of easy fund allocation is needed. On the other hand, the excessive government intrusion is not recommended to create depression jobs with their illusive pressure tactics, TVA is a good example which brought numerous criticisms, and we must be fully aware and be warned of the developing socialism as a result on such government effort.
- d) Upgrading by coalition has proven its merits in certain fields. Engrs' and Scientists' contributions toward life science have improved the public images. There were occasions that medical interns became graduate research students in the Department of Chemical Engineering, There seems to have been mutual benefits by this coalition,

In brief, it is not the pressure tactics with policies which bring positive results, but the upgrading had to be done by proper recognition, proven record of accomplishments, and subsequent natural upgrading by financial gains,

We shall examine some of the programs and courses in the

USA to keep abreast with the new industry trends.

Detail Examples of Industry & Extension Courses (in USAs)

The following are some of the typical examples of industry seminars and extension courses.

AICHE: conducts lecture series during their national meetings and in the evenings. (fees \$50 to \$250, 3 to 4 time) annually, one day to a week or longer)

Example subjects:

Ammonia plant safety; Gas explosion Venture analysis; Benzene resources Air & Water pollutions; Plant explosion examples Aerospace heat transfer; Advances in separation techniques

AIME-SPE: encourages summer school extension courses or industry programs of universities. (fees- \$100 to \$250, 2 to 3 times annually, one week to a month)

Sponsors: University of Texas

University of Michigan

University of Oklahoma

University of Tulsa

Example of subjects:

Linear programming application

Underground combustion

Tertiary recovery

Ocean corrosion

Oil and gas reserve estimate

Prediction of gas storage reservoir performance

Also, Energy conversion & utilization seminars in recent years, jointly sponsored by AICHE, ASME, ISA, ATEE, etc.

Other professional societies promotes or sponsors for courses on subjects such as: (fees-low, non-repetitive, day to a week in the evening)

CPM, Pert, EVOP

Program library & computer language standardization

Information retrieval

Suggested Programs in Korea

Similar to the examples in USA, we can conceive of following suggested examples in Korea: (fees:?, 2 to 3 days to weeks in the evening)

(25 p.에서 계속)

이와같이 極度로 發達한 自然科學과 技術에서 어떠한 文學的 藝術的 靈感을 얻지 못한 것을 아주 아쉬워 하면서 自己의 科學技術에 對한 無知를 한탄하던 「아돌프 학스레이」의 告白에 대하여 우리 科學技術에 從事하는 사람들은 反省을 하여야 한다. 즉 科學技術은 萬人의 共有物이 되어야 한다. 이것이 바로 科學技術의 大衆化는 人間化 社會化이며 科學技術의 社會的 統制를 뜻하는 것이 된다.

一般 法律知識은 法學徒가 아니면서도 社會生活을 正當하게 營爲하는데 極히 必要하다는 것이 常識이 되어 있으면서 이렇게 高度로 發達된 科學技術에 對하여서는 無識하여도 當然한 것으로 생각하는 이 風潮는 健全한 科學技術의 發達에 커다란

Excessive refinery bottoms

LPG barge

Waste recovery industry

Ocean & agricultural products

Air, Water, Oil sludge pollution control

Hazard, explosion, & safety

Waste plastics & its usage

Coating & adhesives

Chemical foodstuff

Nonwovens technology

Crude to synthetic fabrics

Analog simulation & Engineering analysis

These cover from theory to applied industrial problems which promote industrialization, its advancement, and be able to communicate with industry executives.

Of course, we should be able to stimulate other subjects of interest in other fields as well.

Precautions

These must be conducted in harmony and with mutual respect; any abrupt revolt against the existing system and management, and investors, by pressure tactics must be prohibited. Newton's third law will undoubtedly apply to this cause and effect.

The un-necessary competition among ourselves which is destructive and detrimental of our own professional status should be avoided, and this program is not intended to criticize any university curriculums, and we must be flexible enough for the purpose of reaching the goal.

Conclusion & Recommendation:

In consideration of changing industry trend, to provide opportunities for limited exchange of opinions, and to arouse new business interest, it is recommended to conduct industry seminars with the support of professional societies and trade unions.

To communicate the opinions of scholars for commercialization and technical advancement, with industry executives and their staffs, and other educators, Intensive Short Term Extension Courses are recommended under the sponsorship of the recognized learned societies and universities.

암적 要因이 아닐 수 없다.

지나치게 特殊化하고 專門化된 科學技術을 充分히 社會化 民衆化시키는 데 우리 科學技術學徒들은 새로운 작성이 必要하다고 생각된다.

結局 科學技術이 社會에 貢獻할 수 있는 最大의 寄與는 宇宙는 人間의 本性에 關한 知識을 주어 人間 스스로 自己의 運命을 뚫고 나가는데 큰 도움을 주는데 있다.

이러한 뜻에서 앞으로의 科學技術은 새로운 人間生態學的 倫理에 立脚한 社會的 統制를 받아야 할 것이다.

여기서 우리는 科學技術學徒들의 社會參與에 대한 參與 發見할 수 있으리라고 생각한다.