

Report on 4th World Conference on "Continuing Engineering Education"

Held at Beijing, May 17th-19th, 1989

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The Fourth World Conference on "Continuing Engineering Education" was organised by UNESCO in collaboration with the peoples Republic of China at Beijing from May 17th to 19th, 1989.

More than 800 delegates from about 90 countries, developing and developed, participated. About one hundred papers on various aspects of "CONTINUING ENGINEERING EDUCATION" were presented. The paper "CONTINUING ENGINEERING EDUCATION OF TEACHERS IN INDIA" — NEW APPROACHES written by Prof. B.B.Chopne, Prof. B.M.Naik and Mr. M.L.Waikar was presented by Prof. B.M.Naik on 19th May 1989.

The policy paper of UNESCO on "CONTINUING ENGINEERING EDUCATION" was presented by Dr. Ibukun. In his paper he projected high demands on Education of Engineers in 21st Century requiring the activity of "CONTINUING ENGINEERING EDUCATION" in all the Countries. This has become very essential especially because of the New Challenge of Technology Revolution and its utilization for well being of the human kind. With the increase in population of the World, and to cope with the rising aspirations of people, "SCIENCE AND TECHNOLOGY" needs to be respected, developed and applied in various vocations and professions on increasing scale. Innovations in Science &

Technology have to be encouraged and incentives be provided to Science & Technology personnel for their outstanding contributions.

The potential of personnel qualified in Science & Technology, regardless of the boundaries of the Nations, need to be fully explored. Continuing Engineering Education plays a important role in this. Some of the important objectives of C. E. Education as outlined in the Conference are -

1. To increase National and World productivity.
2. To use latest Science & Technology.
3. To avoid sickness of Industries.
4. To respond to International competition
5. To improve competence of working engineers.
6. To accept challenges and make best use of available opportunities.
7. To keep engineering talent upto date.
8. To promote innovation capacity of engineers.
9. To maintain life long competence.
10. For preparing engineers to shoulder responsibilities more ably.
11. Greater job satisfaction.
12. Change of job for betterment.
13. Learning new technologies.
14. Job growth and promotion

15. Filling gap between formal education and practical industrial needs.
16. Avoiding obsolescence.

Budget is being earmarked by UNESCO for undertaking C. E. Education Programmes all over the World. Project proposals are being invited from various Countries, which would be scrutinised and funded by UNESCO. An International Association of C. E. Education with the objective of providing Continuing Engineering Education World over has been constituted with the head quarter in Helsinki (Finland). In the Conference various Countries have shared their experiences on C. E. E., latest situation of C. E. E. in a few Countries is given below :

United State of America (U.S.A.)

In U.S.A. "CONTINUING ENGINEERING EDUCATION" is quite an old hat. It is offered by many professional societies of engineers. It is also offered by Universities, most of whom have opened special departments exclusively for C. E. E. About 30% students in Universities are C. E. E. students. C. E. E. is being further strengthened to maintain and develop superiority and Competitiveness of United State industry.

The need of Continuing Engineering Education is perceived by the engineers for their own growth, so also by their employing organizations. Universities find it a rewarding experience to run C. E. Education courses for they generate income besides obtaining interaction with industry for mutual benefits.

There is a committee appointed by United State Government to look into career long education. On its recommendation the

United States Government have established accreditation Board to control quality of C. E. Education. It is realised that C. E. Education is very useful to increase National Productivity and develop intellectual capital resources.

University of Texas, Madison and several others have setup, CC-TV, Uplink Antena, Networking, Interactive video disks, PCs, Computer Aided instructions etc. Cable Television, Microwave transmissions for C. E. Education. Role of Universities and academic in C. E. Education is very important. Engineering Schools are widening their scope and working for professions besides teaching to students. They are now aiming at developing a continuously learning society. Which is believed to be the crucial development for human welfare.

China :

In China the concept of "CONTINUING ENGINEERING EDUCATION" was introduced from abroad around 1970, So far C. E. Education has played a important role in improving the performance of Industrial and adaptation of imported technologies etc. experience demonstrates that C. E. Education is the key to Science & Technology and economic development.

It has been the policy of Government to promote C. E. Education and have established many Institutes exclusively for the purpose. Every Ministry has formulated plans and programmes to train engineers. At the enterprise and institute level, plans have also been made for identification of objectives, contents, requirements, and adopting scientific implementing measures for Continuing Engineering Education.

In 1981, Government made it a rule that each Science & Technology person must receive minimum one month training in 12 months period. It has now become a pre-requisite for promotion of professionals. C. E. Education in China is both a right and obligation of Science & Technology personnel. It is a commitment part of development plan of the department, and expenses incurred are regarded as production cost.

Various professional associations and societies have also played important promotional role for ex. China Association of Science & Technology (CAST), China Association of C. E. Education (CACEE). It arranges International level Continuing Engineering Education programmes for top executives, especially in Collaboration with UNESCO.

They have prepared a grand master plan using satellite, TV, Audio, Video, PCs. etc. for Continuing Engineering Education.

The two major difficulties they experience are

- a) Shortage of good Professors.
- b) Education material.

China is considering to make a law on Continuing Engineering Education so that the large organisations pay for themselves and Government to pay for small organisations.

Quality Teaching material constitutes the basic guarantee for the success of C. E. Education is their experience.

WEST INDIES :

They lay more emphasis on use of satellite in Continuing Engineering Education. University of West Indies is using satellite from 1978

to cater to 14 territories. They regularly arrange interactive video conferences, symposia via satellite. Faculty of Engineering of the University has played a pivotal role in establishing the centre.

Traditional methods of C. E. Education have many limitations. The same are overcome in this method. However, there is an inherent danger in this method viz. of lack of quality control on education. By careful planning it can be kept to minimum if not eliminated. These methods are more cost effective. It requires a sound organisation and good faculty to prepare lessons.

Satellite has a large impact in education, with satellite telecommuting, one will be able to attend International Conferences at one's own place. It is a very inexpensive method, and is making a beginning of a new era in education. Potential is being exploited on priority basis to extend it to wider areas.

In Japan, "CONTINUING ENGINEERING EDUCATION" enjoys not only support from top management but also leadership and active participation in the conduct of programmes. They believe that employing people without educating and training is a mistake on the part of management. Employee Education starts with the stars of an organization. They consciously attempt to develop self supporting and challenging individuals with the ability to cope with the changing environment and technology by self initiative and self learning. In many companies the basic philosophy is, company is only as good as its people". The foundation for company development lies in develop-

ment of its people, such that they work with joy and pride.

The training consists of modules such as Administrative, Economic, Political and Technological systems. Emphasis is laid on hi-tech as Computers, Microprocessors, robotics. Universities and associations of industries take a leading role in imparting Continuing Engineering Education.

It is a firm contention that Continuing Engineering Education is connected with research. An University or Engineering School can be effective in C. E. Education, if it has a faculty group that keeps pace with the rate of technological development. Continuing Engineering Education is not a additional burden for colleges. It is instead an important factor to bring about self development and reform in education. The interaction opens up new areas for research and raises the level of teaching and scientific research. Continuing Engineering Education helps teachers to convert their knowledge into productive force, and raise their influence over the profession. From the Society and Nation point of view it provides a chance to combine theory with practice, which is so essential to advance the professional practices.

The most serious task in this is the development of R & D manpower. After development with so much effort it is likely to be under utilised.

An observation in Korea is that 83% of Ph.Ds are in Universities and in Colleges having access to only 10% of resources and 10% of Ph.Ds in industry having access to 60%

resources. Academic and R & D manpower is grossly underutilised in Korea. Continuing Engineering Education has resulted in Korea from ambitions plans for Industrialization, and continuous dialogue between industry and institutes. Furthering of C. E. Education demands a passion on the part of teachers to teachers to teach and rewards to those who receive C. E. Education. Without incentives C. E. Education becomes difficult.

In many Countries like China, USA, etc. satellite is found to have a large impact on education. It marks beginning of a new Era in education. Automation in education is the new trend in which Computer Aided Teaching (CAT) occupies a prominent place. The new technological developments require new advanced methods of transferring education.

In many socialistic countries like USSR, Poland C. E. Education is considered both an obligation and right of an employee. An employee must undergo C. E. Education when deputed. When not deputed he can as a matter of right ask for opportunities for education.

In West Germany, "CONTINUING ENGINEERING EDUCATION" is considered to be an investment and insurance for better future. It is believed that the College or University Education can only react to fundamental new developments with a time lag. Usually several years elapse between introduction of new technologies and their inclusion in curriculum of teaching institutes. The aim of engineering course is to produce graduates fit for employment not that they are necessarily fully trained. Introduction of advanced tech-

nologies in industry demand C. E. Education for qualified employees. It is the contention that, at present the greatest barrier to the implementation of technological innovations is the lack of qualified employees. In other words, organizations do not find suitably qualified personnel on the labour market and pressure of time hardly allows them to train them themselves. In future, the updating of qualifications must be one of the factors taken into consideration when planning the introduction of new technologies.

Big Companies in West Germany spend on education of their employees. While with the small companies such measures go unrecognised or are undervalued. Their experience is that company-run courses are more effective which have high standard, *independant and are practice oriented*. New technologies create new needs of C. E. Education is well recognised in West Germany. It is possible to learn in a course new things which would take perhaps years to learn from work in a company. They teach to forget the traditional ways of thinking and promote new ways which are untried as yet. The paper presented by Prof. B. M. Naik was very well received. The conclusion of the paper that Continuing Education of Engineering Teachers stands as foremost in developing Countries like India and that International Cooperation, Exchange of Professors and support from UNESCO in the form of fellowships needs to be increased. In the absence of well competent Professors in Engineering Colleges, not only the students remain inadequately educated but - the whole Engineering Society tends to remain incompetitive by

global standards, and C. E. Education tends to remain less effective. The efforts being made to train teachers under ISTE and QIP programmes were very well appreciated.

In conclusion, In India and especially in Maharashtra it is necessary to build partnership between Institutes of Technical Education and Industry for the overall growth of both of them. Technologies employed in PWD, MSEB, State Transport Corporation and other State and Private Industries is requiring modernization. According to a latest survey the productivity of men in India 1/29th of Japan, 1/10th of China and 1/8th of Korea. The share of India's export in World market has dropped down from 2.23% in 1947 to 0.4% in 1989, largely on account of lack of technological capability by world standards. A scheme must therefore specially be drawnout to open C. E. Education Departments in every Engineering College. A seminar or meeting of key persons of our department and industries may be organised to welcome the innovative ideas for implementation of C. E. Education.

The New Education Policy of the Government of India (1986) has also emphasised the need of starting "CONTINUING ENGINEERING EDUCATION" centers to begin with in selected colleges. It has recommended establishment of Regional Resource Development Centres for "CONTINUING ENGINEERING EDUCATION" to develop learning resources, which would keep linkages with Indira Gandhi Open University, New Delhi. Advisory Committees for each cluster or sector of Industry are also proposed by New Education Policy.

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