
The Role of Anna University in Continuous Professional Development: a Model for Developing Countries*

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Rapid advancements in the development and services of information technology and the increasing complexities of the global industrial and educational practices have resulted in a huge demand for quality training and continuous re-training of engineers and instructors the world over. Especially in countries with a rapidly developing economy such as India, the need for large-scale continuous professional development strategies have become inevitable for all leading technical institutions. Realising this urgent need and its moral responsibility to service the industries, sister institutions and society, Anna University is executing a varied range of continuous professional development activities at all levels of education and services, including: on-campus evening programmes, off-campus Web- and Internet-based education to advanced research and consultancy. The paper presents some of the recent initiatives carried out that are vital for the global operation of Anna University, including the Centre for Professional Development Education and the South Asia Centre for Engineering Education.

INTRODUCTION

Anna University, in Chennai, Madras, India, has established unique facilities, such as the Centre for Professional Development Education, the Centre for Academic Partnership, the Technology Gateway and the South Asia Centre for Engineering Education. This is in addition to collaborative research and training activities with all national laboratories in the country. The objective of this paper is to discuss the varied range of services and programmes of Anna University towards the effective continuous professional development of practicing engineers, researchers and technical teachers in India. As these activities are found to be effective and economical, they can also be a model for many developing countries.

BACKGROUND

Continuous professional development (CPD) is commonly used to denote the ongoing process of education and development of professionals, from

initial qualifying education and for the duration of their life. This is in order to maintain competence to practice and to increase professional proficiency and expertise. It is an educational process by which professional people maintain, enhance and broaden their knowledge and skills [1].

Continuous professional development education includes formal study programmes and courses or conferences for individuals. CPD embraces many other activities through which individuals learn and develop their skills and expertise. It includes informal learning, on-the-job learning, and intended and incidental learning. It enables professionals to expand and fulfil their potential [2].

CPD is a career-long process that builds on what the practitioner already knows and prepares the individual for changing roles in service delivery. It is an investment in quality. It is the systematic maintenance, improvement and broadening of knowledge and skill and the development of personal qualities necessary for the execution of professional and technical duties throughout the practitioner's working life [3].

Over the last decade, growing industrial competition and the globalisation of the economy have created a large demand for the continuous training and re-training of working force. In response to this

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need, and to effectively utilise the institution, Anna University in Chennai, India, is offering range of continuous professional development activities to working professionals in India.

OBJECTIVES OF ANNA UNIVERSITY'S CPD PROGRAMMES

The major objectives of CPD activities at Anna University are to:

- Identify and bring about the changes in professionals that are necessary to achieve the specification and implementation of standards of occupational competence in order to meet the needs of the full range of employment. This includes the needs of the self-employed.
- Maintain, enhance and broaden professional knowledge of practicing engineers through continuous training and re-training.
- Help professionals to fulfil their potential and enhance their technical skills to prepare the workforce for the changing roles in the service industry.
- Provide quality higher education to geographically isolated practitioners by utilising the advancements of information technology in order to help them to maintain quality and relevance of professional service.

With these objectives, Anna University's CPD activities are expected to achieve the following in the individuals:

- Enhance professional knowledge, skills and status.
- Encourage their higher standard of professional performance and offering increased job satisfaction.
- Promote awareness of new developments and concepts.
- Provide a framework for making informed decisions about future professional activities and offering the means to improve career prospects and the taking on of new roles.
- Provide opportunities for establishing a network of people with similar skills and interests.

PROFESSIONAL DEVELOPMENT AVENUES AT ANNA UNIVERSITY

Anna University, one of the premier technological institutions in the country, is offering through its on-campus regular programme as many as 47 under-

graduate programmes and 57 postgraduate programmes, besides research programmes in almost all areas of science and technology. Most of the programmes are unique and internationally well renowned by industries and academics. The areas of expertise include remote sensing, biotechnology, environmental engineering, water resources engineering, crystal growth, laser technology, ocean engineering, energy engineering, CAD/CAM and information technology.

By utilising this vast expertise in human resource and instructional infrastructure, Anna University is providing a range of CPD opportunities for working professionals in the country. To identify, plan and implement CPD activities, Anna University has established a central facility called the Centre for Professional Development Education. Through this centre and through the South-Asia Centre for Engineering Education, CPD avenues are being provided to working professionals in the country. These opportunities may be broadly classified into three categories, namely:

- Long-term opportunities.
- Short-term opportunities.
- Web-based engineering programmes.

Long-term Opportunities

Anna University has produced large numbers of undergraduates, postgraduates and research scholars through its long-term CPD services. The long-term avenues are programmes of duration varying from two to four years. These include seven-semester part-time evening undergraduate programmes for working professionals in the region. Nineteen undergraduate programmes are being offered in almost all branches of engineering and technology. These programmes are offered during convenient evening timings and are made flexible and accessible to aspiring learners. Anna University has produced large numbers of such graduates and upgraded their skills.

Furthermore, in addition to these undergraduate programmes, MSc (by research) and PhD programmes are also offered for practicing engineers in industries and faculty members in the neighbouring institutions.

Short-term Avenues

In addition to long-term courses, opportunities are also provided through short-term courses. These include seminars, conferences, symposia, workshops and working group meetings. These programmes are

offered based on the needs of the industries on their request and also designed by the University.

The frequent training and re-training needs of the industries in the thrust areas are being identified and offered at regular intervals. Such fields include:

- Computer science and communication
- Information technology
- CAD/CAM, instrumentation and control systems
- Chemical technology
- E-commerce technology

These programmes are being conducted several times a year at a time convenient for the industrial learners.

Web-based Postgraduate Engineering Programmes

The nature of work in industries continues to change with higher mobility and more shared working. Re-training is essential today as never before as trade and business are becoming knowledge-intensive [4]. On the other hand, the growing number of engineering institutions in the country has resulted in the serious deficiency of a trained workforce in the areas of engineering education and training.

Realising this urgent need and its moral commitment to serve the industries and institutions in the country, and also make use of advancements in information technology, Anna University proposes to offer MEng, MSc (by research) and PhD programmes through modular phased, tele-training using the Internet and the World Wide Web.

Web-based instruction offers a quality-engineering programme to help professions meet the challenges and opportunities of a rapidly changing world by offering courses through satellite communication and the Internet. Students are encouraged to communicate with the instructor via telephone, e-mail, mail or campus visits. They can access databases of courseware in different formats from remote areas and can interact with the instructor at his/her own convenience [5].

Anna University's Web-based engineering education has three distinct learning benefits to offer. These include attractive and convenient modular learning pattern called the Credit Bank System, enhanced learner participation through high interactivity and effective instruction through stimulation.

The Credit Bank System is a flexible learning path to acquire higher degrees and diplomas for working professionals through web-based engineering education. In the Credit Bank System, credits may be earned

and utilised in two ways, namely formal credit accumulation and non-formal credit accumulation.

Thus, it not only enables learners to acquire and transfer credits from their prior learning without further instructional needs, but also facilitates acquiring credit for non-formal, experiential learning, assessed and recognised towards further study programmes. If an individual has already completed a programme, the Credit Bank System allows the opportunity to build on it to complete a further credential.

The working professionals, engineering teachers and home learners who are geographically separated can interact effectively with experts in the University and industries. Online chats, direct interaction with the instructor during and after live presentations, interaction with other fellow learners are the salient features of Web-based engineering education. This not only enhances their horizons beyond what is possible from classroom instruction, but also facilitates them to learn at their own convenience.

Other Avenues

In addition to regular long-term, short-term and Web-based learning opportunities, other avenues of continuous professional development of individuals working in industries, sister institutions and research and development laboratories are also being provided.

A Centre for Academic Partnership, established for better linkages and the sharing of resources with other technical institutions in the region, is engaged in offering need-based training programmes and workshops for its member institutions.

The Technology Gateway Centre at the University activates triangular partnerships with industries, institutes and R&D laboratories. It aims at passing on state-of-knowledge and infrastructure to the partners, thereby helping them to continuously update their human resources by various means, mainly to facilitate them to take the research results to the industries in a better way.

With similar aims, the University has signed an academic understanding with several national research laboratories under the Council of Scientific and Industrial Research. It envisages the continuous upgrading of knowledge and skills of scientists and engineers in these laboratories by providing opportunities for collaborative research at all possible levels.

SOUTH ASIA CENTRE FOR ENGINEERING EDUCATION

The UNESCO International Centre for Engineering Education (UICEE) is widely regarded as a most significant undertaking in the globalisation of engineer-

ing education and has garnered acclaimed international recognition and support. Its principal objective is to foster technological advancements in developing countries by improving the standards of engineering education [6].

In recognition of its high standard of engineering education and commitment in services to the neighbouring countries, Anna University has been identified as a seat to establish a satellite centre of the UICEE for the South Asian region, titled the South Asia Centre for Engineering Education (SACEE) [7].

A Partnership Agreement, signed in July 2000, led to the official launch of the SACEE on 10 January 2001. The launch was conducted with the presence of the University management, deans of faculties, directors of institutes and centres, as well as the local press. The SACEE is the next in the family of satellite centres being established under the auspices of the UICEE, and is under the Directorship of Prof. Adinarayana Kalanidhi, the Vice-Chancellor of Anna University. Prof. Vaithilingam Guruswamy has been appointed Honorary Director and Dr Swaminathan Ramakrishnan is Coordinator of the Centre.

SACEE's Prime Objectives

The Centre's paramount objective is to provide a focus for academic and research activities related to the work on teaching methodologies in developing countries, and in particular on the development of teaching methodologies for education in the establishment of small and medium sized enterprises that are so vital for economies in developing countries.

Moreover, there are other core objectives of the Centre, which involve many core elements. These includes establishing an international network of contacts with leading academic institutions, industrial leaders and individual academics through the UICEE.

This network is expected to facilitate collaborative research, joint seeking of funds and the sharing of resources in engineering education. Furthermore, in order to integrate the mutual interests and educational services, the SACEE is working on forming a network of professional societies, such as the Institution of Engineers. This will also enable professionals to benefit from the comprehensive services from all sectors.

The SACEE is focusing on the issues concerning the training of engineers, which includes human resource and material resource crises, in-service training and the application of methods and media, besides need-based research.

The Centre is involved in generating a comprehensive database on engineering education, which includes

institutions, industries and other agencies. The objective here is to facilitate users in South Asia to gain access to reliable information on various international activities that are being carried out in engineering instruction and training.

The major area of concern for the SACEE is to arrive at uniform educational standards in instruction and training so that a student could be a global engineer who is able to adapt him/herself to any industrial environment in the world. The other important activity identified by the SACEE is to conduct survey and research on need-based curriculum for both undergraduate and postgraduate programmes.

The Centre has proposed to offer advanced graduate courses in engineering education, in accordance with the guidelines established by the UICEE [8]. These courses, which are currently being developed by international experts, would provide the necessary training and qualification for both in-service technical teachers and also for those who intend to take up their careers in engineering teaching.

The Centre is also concerned with the specific problems of female engineers in the South Asia region. Strategies are being worked out to provide them with improved career opportunities, both in industries and at institutions.

To facilitate the better exchange of ideas and results, the SACEE plans to introduce an international journal in professional development education with an editorial board that would contain experts from around the world. The SACEE has likewise initiated projects on developing educational courseware, higher learning materials and textbooks. Several topics and authors have been identified for this purpose.

In order to facilitate the continuous professional development of engineering teachers in the South Asia region, the SACEE has decided to offer research fellowships to in-service technical teachers in this region. These fellowships may be utilised to pursue MS and PhD programmes at Anna University. Additionally, the SACEE is negotiating with government and industries to institute a professional chair at the SACEE. The objective of this initiative is to have a full-time senior international expert at the Centre to set in motion various research and training activities in the field of engineering education.

In summary, it is envisaged that this Centre will provide a focus for academic and research activities related to the work on teaching methodologies in developing countries. In particular, special efforts will be directed towards developing teaching methodologies for education in the establishment of small to medium sized enterprises that are essential for economies in developing countries.

CONCLUSION

Unlocking the potential of individual people by giving them the chance to acquire skills and qualifications will be of the greatest importance in the years ahead. It will not only determine success and self-fulfilment for individuals themselves, but will also be essential to sustain a successful national economy in an increasingly competitive world.

Realising this need of the industries and institutions and its moral commitment to serve this society, Anna University is delivering a range of professional development services through the South-Asia Centre for Engineering Education (SACEE) and the Centre for Professional Development Education.

It is believed this could be a model for similar technical institutions in developing nations. The continuous evaluation of Anna University's CPD programme is being undertaken to provide better services and convenient need-based programmes.

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BIOGRAPHY



Prof. Adinarayana Kalandidhi graduated from Madras University in 1971 with a BE in Mechanical Engineering and two years later completed his ME in heat power engineering. He achieved his PhD in Heat Transfer in 1978. From 1973, he was a lecturer in mechanical engineering at Ma-

dras University before moving to Anna University to continue the role in 1978. From 1981 to 1985, he was an Assistant Professor in mechanical engineering at the College of Engineering at Anna University. From 1985 to 1986, he conducted postdoctoral research at the University of Southampton before returning to Anna University as Associate Professor.

From 1989 to 1993, he was Professor and Head of the Thermal Sciences Division at the Department of Mechanical Engineering, College of Engineering, Anna University, and established various laboratories, prepared proposals for various projects and established contact with various energy laboratories in India and internationally.

From 1993 to 1997, he was Director of the AICTE - Continuing Education Programme in Bangalore, coordinating and conducting several short-term courses for working professionals, and then became adviser to the AICTE in matters covering technical education, syllabi revision, globalisation and privatisation. He has been the Member Secretary on the National Board of Accreditation in New Delhi, contributing to advance the process of accreditation of programmes in engineering, technology, architecture, management, plus others. Prof. Kalandidhi has been the Vice-Chancellor of Anna University since May 1999.

He has helped educate five PhD scholars, 23 MTech graduates, and has completed 12 applied research projects plus other industry-sponsored projects. He holds memberships in many international and national engineering and education bodies, and he is also a Fellow of the Institution of Engineers (India).

Prof. Kalandidhi has had numerous papers published and edited several volumes of proceedings. Furthermore, Prof. Kalandidhi has coordinated and organised several conferences, workshops and symposia.

2nd Global Congress on Engineering Education: Congress Proceedings

edited by Zenon J. Pudlowski

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