



LIFELONG LEARNING FOR PROFESSIONAL ENGINEERS

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“In a time of drastic change, it is the learners who inherit the future” — Eric Hoffer

BACKGROUND

The Academy has recently published a report on this subject¹. This paper summarizes key issues identified in the report, gives examples of guidelines for the various stakeholders, and identifies a need for action.

THE CHALLENGE

Lifelong learning is as essential for Professional Engineers as their initial training and certification. Continued professional development is an urgent imperative to ensure public safety, a sustainable environment, a competitive national economy, a respected profession, a profitable employer, and a fulfilling career.

Although the challenge is common for all engineers, the actions to maintain individual and collective competencies vary among practitioners. Engineers working in large companies usually have access to in-house training and professional development programs, and career success requires the maintenance of competence.

*One driving force is
competitiveness of the national economy*

Large consulting and management companies may also have in-house programs, but learning in large measure comes from participation in a wide variety of projects with diverse clients. Self-employed engineers or those working in small companies usually do not have ready access to professional development programs, and the learning process has generally been restricted to on-the-job experience on client projects. For all the above groups, a formal continuing education system, which may involve our advanced education institutions, is needed to supplement their on-the-job learning experience.

RESPONSIBILITIES AND TRENDS

The primary responsibility for professional growth must ultimately rest with the individual engineer. Engineers

must establish career paths and ensure that their technical competencies grow to meet the challenges of varying assignments. This can be done on the job by using informal networks of information and by formal instruction. However, there are many other participants in the lifelong learning process, including employers, educational institutions, technical societies, and professional licensing bodies.

*The primary responsibility
rests with the individual engineer*

Some engineering organizations have recommended that a certain minimum number of accredited continuing education units (CEU's) be obtained each year in order to renew one's professional licence. CEU standards are maintained by the International Association for Continuing Education and Training (IACET). The Engineering Institute of Canada (EIC) is an Authorized CEU Sponsor.

GUIDELINES AND “BEST PRACTICES”

Many organizations have developed their own approaches and techniques to maintain and improve the competency of engineers. Examples of these are summarized below, for a more complete description see Ref. 1.

Companies

Guideline: establish at the time of hiring a written or implied contract between the employer and the engineer, setting out the commitments of both parties to lifelong learning.

Depending on the size and nature of the organization, different practices can be described in the “contract” as noted in the following examples:

for large production companies — establish a supporting formal methodology within the corporation, involving the preparation of individual lifelong learning development plans consistent

with an employee's proficiency gaps and career expectations.

for large consulting companies — finance internal studies of an industry or an issue for purposes of both business development and to push the boundaries of knowledge of internal professionals.

for Small and Medium Size Enterprises (SMEs) — consciously use some of the resources that arise in day-to-day business activities, such as interactions with customers, suppliers, colleagues and industry associations.

*Use the resources available
in day-to-day business activities*

Individual Engineer

Guideline: prepare and periodically update a lifelong learning plan, consistent with one's general career aspirations, and discuss with one's employer and colleagues.

Two examples of best practices that an individual engineer can apply are:

- document major achievements in engineering, including successful technical projects, major management and administrative contributions, etc.
- aggressively pursue self-directed lifelong learning activities, and maintain a full record of the successful completion of formal credit and non-credit courses, workshops, seminars, etc.

Educational institutions

Guideline: establish lifelong learning programs for engineers as a major institutional mission.

Two examples of best practices that an institution can adopt are:

- include the extent of commitment to lifelong learning in internal and external departmental reviews and accreditation procedures.
- provide courses specifically designed for engineers who have graduated ten or more years earlier, or engineers making career changes, with emphasis on senior undergraduate courses in areas undergoing rapid technological change.

Technical Societies

Guideline: Improve the technical and management skill of engineers by enhancing the effectiveness of traditional information sharing channels.

Examples of best practices are:

- promote technology development in multi-disciplinary areas in collaboration with other technical societies.
- maintain inventory of the continuing education services available, including those of private sector service providers.

*Promote technology development
in multi-disciplinary areas*

Professional Licensing Bodies

Guideline: develop and monitor practical approaches and practices for the various participants in the lifelong learning process.

Examples of best practices are:

- maintain records bearing on the continuing competence of professional engineers, including evidence of participation in formal courses and recognition of achievements in the profession.
- establish lifelong learning guidelines for engineers in management positions, including those having financial, economic and human resource responsibilities.

CONCLUSION

A concerted effort is needed to:

- (a) Bring these messages to the attention of all those involved, particularly the message about the importance of lifelong learning to the national economy.
- (b) Encourage the establishment of a national coalition of stakeholders to coordinate and advance career long education.
- (c) Promote the mind-set that the initial degree is only the first step in the pursuit of engineering competency.

Ref 1: *Lifelong Learning for Professional Engineers*. Canadian Academy of Engineering, 1997

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