The role of continuing education in computer science

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In the present context, "Continuing Education" refers to formal courses offered to active professionals for purposes of career development rather than with an academic degree objective. The general need for continuing education in a rapidly evolving field such as Computer Science is so well accepted as to require no further justification at this time. Rather, it is the purpose of this paper to consider the diversity of approaches to advanced education outside the conventional academic framework and to comment on current attitudes and trends.

FORMAT

The overwhelming majority of participants in Continuing Education programs are employed on a full-time basis either in industry or by government agencies. Usually the employer contributes most if not all of the tuition and expenses incurred by the student. It is necessary therefore that the format of the Continuing Education program take into account the needs and preferences of the employer as well as of the student, particularly as they relate to time lost from work. There appear to be three basic approaches to the scheduling of Continuing Education courses.

Periodic lectures

The student attends formal presentations either weekly or bi-weekly over a period corresponding to a college semester or quarter. Frequently, the material offered in such courses corresponds closely to the material offered during the daytime to regular college or university classes, and occasionally credit earned in such courses can be used toward academic degrees.

Short courses

The student attends an intensive series of lectures approximately seven hours per day for a consecutive period of days. Some short courses last only two days while others span a two-week period. Such courses usually bear no direct resemblance to academic offerings and are frequently taught by "stars" in their technical specialty.

Retreats

A group of students are housed at a relatively remote location for a period of one to four weeks and receive intensive instruction, approximately five or six hours per day, from a battery of lecturers. The formal lectures are generally supplemented by evening programs and workshop sessions.

LOCATION

Depending upon the subject matter and the demand, Continuing Education programs are presented at a variety of sites.

College campus

Most Continuing Education programs are offered on college or university campuses, taking advantage of available classroom, library, and computer facilities. For many colleges this constitutes a convenient way of utilizing their buildings during the evening hours and during vacations; some universities have allocated special classrooms and buildings exclusively for Continuing Education programs.

In-plant

Many large companies have found it expedient to offer Continuing Education programs for their own employees either in their own facilities or nearby. These courses are usually taught in part by specialists on the staff of these companies and in part by imported lecturers.

Road-show

One or a group of lecturers presents essentially the same short course at a number of locations throughout the country and occasionally overseas. Usually, these programs last two or three days and are offered in large urban centers such as New York, Washington, D.C., Los Angeles, etc.
MOTIVATION

Most students enroll in Continuing Education programs in order to advance their professional career. Depending upon the student’s specific job responsibilities and upon his maturity, different approaches to the subject matter may be appropriate. Some Continuing Education programs try to strike some sort of balance between approaches so as to accommodate a broader range of participants. Usually, however, it is possible to identify one of the following as being the major objective of the presentation and the major motivation for the participant.

Depth

The purpose of such a program is to present the latest advances in a highly specialized area. The student should have considerable familiarity with the general subject and desire to learn of the latest advances in the field. The instructor, usually a well-known authority in a specialty, supplies copious notes including information not readily available in the literature. The short course format is the most logical vehicle for such a course, and numerous universities and many private organizations offer such programs either on campuses or on a “road-show” basis. These courses are pitched to various levels of professionals, but most emphasize depth in exploring highly specific issues. During the academic year 1974-75 UCLA, for example, is offering over thirty short courses in the Computer Science field alone. As described in more detail elsewhere,1 approximately one half of these courses are taught by university professors while the other half is offered by recognized authorities in industry. Most of the courses run for five consecutive days, although there are a few three-day and a few two-week programs.

Breadth

Here the student generally desires to round out and at the same time update his technical education by taking college type courses. Most frequently, the material offered in the course is only indirectly related to his present work assignment, and the student looks to the course as an aid to changing his technical specialty or to advance himself within his organization. Although some of these courses may manifest a mathematical depth considerably greater than that found in most short courses, the general approach taken by the lecturer is to provide complete upon the latest advances. UCLA offers approximately twelve such courses in the Computer Science area each academic quarter. Some of these are introductions to programming, but most correspond to courses offered to juniors and seniors in Computer Science during the regular school session. All of these courses are presented using the “periodic lecture” format, with class meetings of two to three hours every week for a twelve-week term. In general, the teachers of these courses are less distinguished than those offering short courses, and the tuition on a per hour basis is less than one-third of that for most short courses.

Overview

Here the audience is comprised primarily of middle and upper level managers and executives. Usually the student will have earned a Bachelor’s or Master’s degree in a technical area fifteen to twenty years earlier; but because of job pressures he has been unable to remain up-to-date and to explore newly-emerging technical disciplines. Such a student will expect to be briefed on the significance of new developments and to obtain a perspective over the interrelation of currently fashionable devices and techniques. He is not interested in absorbing a large number of facts or in learning new skills. For this purpose the “retreat” format appears to be the most suitable. The manager physically absents himself from his job for a number of weeks and essentially emerses himself in a carefully planned and coordinated program. For many years, UCLA offered a program of this type entitled “Modern Engineering for Engineering Executives”. Lasting from four to six weeks the program was offered in a resort-like location to a class of approximately thirty executives. More recently, a similar program has been offered on a private basis to executives and managers of companies such as IBM, Boeing, Texas Instruments, and a number of others.

CURRENT TRENDS

Fifteen years ago most Continuing Education programs were of the “periodic lecture” variety. Today the short course format appears to be the most widely accepted. From the student’s point of view a short course constitutes a welcome change of pace from his regular work routine—an opportunity to mingle briefly with his peers from other companies, and a stimulus to engage in self-study. From the point of view of organizers of Continuing Education programs, a short course usually attracts a higher level and therefore a more affluent audience, and the compact scheduling of the lectures facilitates the obtaining of top-notch lecturers. The latter usually find short course programs far more lucrative than any other teaching opportunity. By contrast, the students usually find that a course offered along the “periodic lecture” format comes as an addition to his day-to-day responsibilities, necessitating one evening of attendance and at least one additional evening of self-study per week. Such a course therefore requires a much longer-lasting and serious motivation than the short course. As a result, attendance at “periodic lecture” programs appears to be diminishing, while short course programs are on the ascendance.
Another current trend is toward formal recognition of Continuing Education programs. A number of universities, including UCLA, offer special certificates for the completion of a specified number of Continuing Education courses. Throughout the nation the concept of the Continuing Education Unit, (CEU) is gaining increasing acceptance. One CEU is earned for every ten hours of Continuing Education class contact and provides a formal record and recognition of the student's participation in Continuing Education programs.

REFERENCE
