A COMMUNITY BASED PROFESSIONAL DEVELOPMENT PROGRAM IN DATA PROCESSING

Robert J. Benson
Robert A. Rouse*

Center for the Study of Data Processing
Washington University
Saint Louis, Missouri 63130

Abstract

A joint University-Business Professional
Development Program is providing data
processing training and education to the
Saint Louis metropolitan area. While housed in
the University, the Program's content is directed
by a steering committee of data processing pro-
fessionals representing supporting corporations;
this committee identifies faculty and evaluates
the outcome of each activity. The Program strives
to combine state-of-the-art data processing with
conceptual developments to increase the effec-
tiveness of programmers, analysts and managers.
An important derivative has been the assimilation
of ideas and practices into the undergraduate
and graduate curricula of the University.

Introduction

Washington University and eleven business
and commercial corporations have created a
Professional Development Program, serving the
education and training requirements of data
processing professionals. The Program is
administered by Washington University and
draws heavily upon a combination of faculty
and individual experts to present seminars and
intensive courses for trainees, programmers,
analysts, data processing management and
non-technical users and managers.

The University has offered Certificate
and Bachelor of Science in Systems and Data
Processing and Master of Data Processing
degree programs for over a decade. These
programs provided entry-level data processing
education and advanced topics for established
data processing personnel. These degrees were
traditionally offered as semester-length courses;
the packaging often made it difficult to meet
the intensive training needs of existing data
processing professionals and individuals new
to the field.

During the fall of 1975, the University was
approached by a group of data processing
managers from large corporations, headed
by Price-Waterhouse, Incorporated[1]. The
corporations indicated a strong commitment to
on-going education for their data processing
staffs. The sizes of these staffs, averaging
about 100 individuals, made the costs of send-
ing many people to seminars/courses away from
Saint Louis prohibitive. The corporations
indicated that they needed a broader range
of training/education than could be provided
by in-house capabilities or national vendors
of data processing training. Furthermore,
these corporations wanted a strong voice in
defining seminar and course content, faculty
selection, quality control; the emphasis had
to be on conceptual understanding underscored
with *in vivo* experience and knowledge. In
return for the University's administration of
an on-going professional development program,
the corporations agreed to a substantial
financial and staff commitment.

Program Development

Beginning in March of 1976, the Professional
Development Program has offered seminars and/or
intensive courses on a monthly basis to data
processing professionals. These efforts have
been very well received by individuals from
heterogeneous corporate, hardware, software and
development environments. This acceptance is
due largely to the process by which the overall
program is directed. The process involves direct
commitment of time by corporate affiliates to
planning and presenting programs and, hence,
represents a truly community based effort.

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* To whom correspondence should be addressed.

[1] Other corporations involved with the
Professional Development Program are
Anheuser-Busch, Incorporated; Blue Cross
Hospital Service, Incorporated of Missouri;
Brown Group, Incorporated; General American
Life Insurance Company; Kellwood Company;
Laclede Steel Company; Mallinckrodt,
Incorporated; Missouri Pacific Railroad;
Monsanto Company; Pet, Incorporated; and
Ralston Purina Company.

The Professional Development Program is developed in two cycles; one for selecting annual seminar topics, one for defining contents of each seminar in detail. The selection of a year's topics begins in early fall with a brainstorming session of those corporations directly affiliated with the Program. From those seminar ideas, a ballot of approximately fifty candidate seminars is prepared and discussed within each firm. A rating is generated for each seminar from each firm and a composite rating for all candidates computed. The top twenty or so seminars are then discussed at a subsequent meeting of affiliated company representatives and a final list determined by January 1, six months before the Program year begins.

In addition to the annual planning cycle, a steering committee of data processing professionals from corporate affiliates and professional organizations meet on a monthly basis to define more carefully seminar/course content, to suggest and select faculty and to evaluate the most recent presentations. This has provided the technical guidance and practical perspective which has focused the Program's activities on state-of-the-art developments with pay-backs in the three-to-six-month time frame. This focus plus the traditional academic commitment to the conceptual development of ideas has resulted in the development of effective curricula. The curricula development process usually requires several steering committee sessions during which alternatives are debated and final objectives and outlines agreed upon.

Faculty selection, guidance and preparation have been important elements in the success of a given program. The faculty has been composed of roughly 40% academic and 60% industrial contributions. Individuals have been chosen on the basis of professional experience and expertise and a desire to make the two-to-three-week time commitment to prepare for and present a program. It has proven crucial to convey to each faculty member the objectives and flavor of each program; this has been a difficult task, requiring additional input from program management and the steering committee. Corporate affiliates have been most generous in committing their most talented and productive people to take part in the development and presentation of seminars and courses.

The steering committee has also made a point of carefully reviewing each program. Written evaluations are combined with personal interviews to determine if the program met committee expectations. Questions concerning the performance of individual faculty, the usefulness of written material and texts, the match between who attended and whom the seminar was designed for, are typically addressed after each session. These evaluations have been most supportive in establishing a high quality level for both the faculty and directors of the Program.

The process has been most useful in one other respect. It has promoted an understanding of the environment necessary to carry out both quality data processing and quality data processing training and education. The professional staffs of the corporate affiliates have had the opportunity to observe successes elsewhere and use the best thinking of an evolving professional data processing community. Seminar faculty have benefited from preparation of their presentations and the lively interaction at the seminars themselves.

The Program

Programs are presented to roughly four audiences; introductory/trainee individuals new to data processing, experienced programmers and systems analysts, data processing management and non-data-processing personnel. Figure 1 lists the seminars/courses which have been offered by audience since the beginning of the Program. Many seminars have been repeated, but four-to-six new seminars/courses are built into each year's schedule.

Programs are offered frequently throughout the year. The format for a program is largely a function of topic, and who the attendees are. The format is designed to increase the probability that the training will occur. Two- and three-day seminars, offered monthly, are aimed at those individuals responsible for day-to-day operations and systems development; these people can often fit several of these seminars into their schedules each year. This format is strongly preferred by managers and supervisors. Intensive courses are offered six-to-eight times a year and vary in length from one week to one month; these are full-time activities, primarily to train entry level personnel in programming and systems analysis and design. It is anticipated that advanced technology courses will also be offered on this basis in the future. The actual timing of courses throughout the year is important and is normally determined by the steering committee during the annual planning cycle. An example of a seminar outline is presented in Figure 2.

Recent Developments

The Professional Development Program has grown substantially in the last year. Washington University has provided a formal home for the Program in its Center for the Study of Data Processing. Furthermore, at corporate affiliate urging, The Center is building a data processing research library and a directed staff development program which will respond to the requirement for readily available (two days or less notice) training and education.

Seminars and courses are now being offered three weeks per month. The indication is that the demand for more advanced seminars in telecommunications and data-base design and programming, and for non-data-processing personnel will increase. This will necessitate that certain seminars be tailored to specific corporate environments. Additional staff is being sought to accommodate the curricular expansion which will be required.

The Professional Development Program has become perhaps the most visible example of university-business educational programs in Saint Louis. This, of course, is well received by the University administration, not only for financial reasons but also for providing evidence of cooperative university-community possibilities. Washington University is a research-oriented, national-scope institution; a program that emphasizes the local community is, thus, doubly important in building ties where the institution can easily be perceived as aloof and remote from the surrounding community.

A more important implication of the Program is its relationship to otherwise academic programs. It should be apparent that the entire data processing gamut is covered. Developing the seminars has forced the Program staff to describe a thorough, complete understanding of the under-lying materials---creating a repository of state-of-the-art techniques and technologies in use in typical corporate data centers. This characteristic is reinforced by the use of active data processing professionals as a part of the teaching staff, who provide a wealth of insights into how computer technology is successfully (and unsuccessfully) applied in their particular corporate environments.

Is this important? Over the short term, we have observed significant impact in our understanding of data processing educational objectives and concepts for use in the undergraduate and Master of Data Processing (MDP) programs. This is not to suggest any decline in the importance of sound conceptual development and theory in educational programming. Rather, access to state-of-the-art concepts provides an 'acid test' for academic program content. In some ways, the corporate date processing centers represent our 'laboratory' for exploring the underlying theories in the practice of data processing.

Over the long term, we believe the Professional Development Program (and related training programs developed in the Center for the Study of Data Processing) is a unique opportunity to develop substantive insights into computer based data processing, particularly as the underlying technology base undergoes continual change. We are able to study firsthand the mainstream trends; use of structure in systems development, distributed and decentralized service systems, maturing of data-base and data-communications, adoption of satellite communications systems, privacy and security---the list is endless. We are convinced this opportunity is dependent on the close corporate relationships produced by providing training resources such as the Professional Development Program, and thus we expect to devote considerable energies to keeping this activity viable and useful to the corporate community.

The future for similar professional development programs is bright. As the availability of entry-level personnel dwindles in the next ten years, the need to retrain and upgrade existing data processing staffs will increase. The community based approach provides the expertise and organization to make such training possible and successful.

Level	Seminar/Course Title	Length
Entry	Systems Analysis and Design	4 Days
	Data Base Concepts	4 Days
	Structured Programming	3 Days
	Effective Communications in Data Processing	3 Days
	Intensive COBOL	20 Days
	Intensive Systems Analysis and Design	10 Days
Advanced	Cost/Benefit Analysis	2 Days
	Data Base Design and Implementation	2 Days
	Project Management and Control	2 Days
	On-Line Systems Design	2 Days
	Structured Systems Design	2 Days
	Distributed Systems	2 Days
	Data Processing Control and Auditing	2 Days
	Bank EDP Auditing	5 Days
	Effective Communications in Data Processing	3 Days
	Structured Programming Workshop	5 Days
	Intensive Data Base Programming	10 Days
Management	Techniques of Programmer Productivity	2 Days
	Operations Management	2 Days
	Project Management and Control	2 Days
	Distributed Systems	2 Days
	Data Processing Management and Planning	2 Days
	Management Training for Data Processing	2 Days
	Effective Communications in Data Processing	3 Days

Figure 1. Seminars and Courses Offered by the Professional Development Program

Structured Programming Methods

Seminar Outline:

Structured Programming
 What is it?
 Why is it useful to the programmer?

The Transition
 Modular to Structured Programming

Fundamental Principles
 Functional definition
 Hierarchy of program design

Constraints
 Programming options
 Language constructs

Expression of Program Logic
 Decision Tables
 Warnier Diagrams

Intra-Program Communications

Implementation Techniques

Nassi-Schneidermann Charts for Module Design

The Strucmaker Approach
 Encouraging top-down design
 Generation of the COBOL skeleton

Conversion of COBOL from Unstructured
to Structured

Case Studies
 Two major case studies are investigated
 from specification to code. Application
 of functional partitioning, completeness
 criteria, decision tables, charting of
 program logic and language constructs
 are emphasized.

Figure 2. Brief Outline of a Three-Day Seminar