Contents

ARTICLES

Introduction to Special Issue
Carol A. Carrier 2

Evaluating Personal Income from Internships
Deborah E. Krafczak and Barbara Lefferts 3

Does Economic Self-Interest Translate into Educational Improvement?
Bruce R. Dalgaard 7

Higher Education and Business Relations: The Case of the Education Utility
Dennis D. Cooler 10

The Corporate Training Department as a Clinic for the Study of Instructional Design
Wellesley R. Foshay 17

The University of Minnesota and Wilson Learning Corporation: An Alliance that Works
Carol A. Carrier and James J. L'Allier 22

Internships in Educational Technology Academic Programs: A Status Report
Ann M. Lorenz, Virginia A. Jorstad, and Barry Bratton 25

DEPARTMENTS

Book Reviews, edited by Allison Rossett 28

The Theoretical and Conceptual Bases of Instructional Design
by Rita Richey
Reviewed by Allison Rossett 28

ERIC Reports on ID, edited by Barbara B. Minor 29
Introduction to Special Issue

The initial impetus for this special issue on partnerships between higher education and business grew out of Academia's awareness of the new relationships between educational and business organizations that is blossoming across the country. It appears that those of us in colleges of education have become more comfortable with alliances with business and that this attitude is shared by our business colleagues. Perhaps we have become more interdependent as we recognize the growing need to join forces in order to explore important issues related to teaching, learning, and the uses of technology to train new professionals, and to develop products that reflect the growing knowledge base.

Those of us who teach in instructional design and who have networks of graduates or student interns in business are keenly aware of the benefits of communication between our two environments. As evidence of this, at the two meetings of professors of educational technology held at Shawnee Bluffs, Indiana during the springs of 1985 and 1986, a major topic of discussion was the relationship of graduate training programs to business and industry. Many of the graduates of our training programs now seek internships or full-time employment in business settings, a trend which has led to closer scrutiny of the relevance of our curricula for the types of roles that people assume in these settings.

This issue highlights some interesting higher education/business alliances and projects that have special meaning for instructional design professionals. The article by Dalgaard provides a brief historical perspective on the rise of partnerships between higher education and business. Cummings reports on the results of a survey of literature on business-education cooperation. Goober's piece describing the Education Utility presents an impressive new application of a large-scale computer network system for education that will necessitate the cooperation of many institutions. The Carrier and L'Allier article describes a research alliance between one college of education and a corporation that produces training that emphasizes joint investigation of problems related to adult learning and the use of technology. The paper by Nawakowski, Brown and Floyd discusses an evaluation/research system jointly developed and implemented by a University and a business.

Foskay's article deals with the delicate but promising prospect of conducting educational research in business settings. He presents several guidelines for conducting research in these settings that should be very useful to those from academia.

Two articles focus on the use of the business internship for graduate students. In their paper, Krafczek and Lafferts discuss how interns perceive the financial, experiential, and psychological benefits to be derived by completing internships. Lorenz, Jostad, and Bratton report the results of a survey of educational technology programs regarding their current practices and policies dealing with internships.

There are many interesting projects underway that bring together higher education and industry; we have sampled only a few of them in putting together this issue. Likewise, there are many issues that have to be addressed as we begin to work more closely together. Perhaps it is time to consider the use of a data base to store descriptions of these partnerships so that we can all learn from what has been accomplished.

A hearty thanks to all of the authors who took time away from their work on the various enterprises described here to contribute to this special issue.

Carol A. Carrier
Guest Editor
Special Issue
Evaluating Personal Income from Internships

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Abstract. Graduate students contemplating an instructional design internship should consider not only what they have to offer an organization but what they want to take away from the experience. Current literature on this topic focuses on the mutual benefits of internships for both the business and academic communities. This paper concentrates solely on the benefits to the individual interns which may be described as three kinds of personal income: financial, experiential, and psychological incomes. A group of former and current interns were interviewed and asked to give their opinion on the three incomes. Then they were asked to evaluate the importance of each income, both before and after their internship. Interviews revealed some trends in how participants described the three incomes and indicated that an internship itself may precipitate a shift in how one rates the importance of each. In order to help prospective interns assess what they want from a position, a checklist of questions to consider is included.

"In order that people may be happy in their work, these three things are needed: They must be fit for it. They must not do too much of it. And they must have a sense of success in it."

John Ruskin (1819-1900)

These words, written one hundred years ago, suggest a timeless formula for worker satisfaction. Achieving the right match, however, is not easy. Consider, for example, the movement toward more worker autonomy that is to permeate General Motor's new Saturn facility. Recently, Business Week featured this bold new experiment describing how a "new equality" would replace the former management structure by switching to consensus decision-making among the rank and file (Edid, 1985). One intended outcome is to increase job satisfaction through participation on the part of all employees. To this end, work units will be carefully chosen by focusing not only on the ability of prospective employees, but also on their compatibility with the work environment.

Now imagine this: You are a graduate student in instructional technology. To gain practical instructional design experience, you apply for an internship at a corporate training facility. You believe this would be the perfect opportunity, to earn while you learn—financial and experiential income guaranteed.

Armed with your resume and portfolio of writing samples, you arrive at the personnel office. First, you take a series of tests to assess how well you will fit into the hi-tech system. You pass muster with personnel but there's one more hurdle to clear. You must be interviewed by and offered a position with one of the various project teams before you can be hired. So you make the rounds until you find a group where your technical skills, work ethic, and sense of humor will make you well-accepted.

Such interest in worker productivity and satisfaction reinforces Ruskin's earlier notion that people are happier in their work knowing that they are (a) qualified for the position, (b) achieving a comfortable balance between their personal and professional lives, and (c) successful in what they do.

Today's job seekers aspire to the same goals, but they target their approach according to slightly different standards. Individuals today are encouraged to validate career choices through the practice of internships and to think of each new opportunity in terms of the "gives" and the "takes." To do this, two questions must be asked:

1. What do you have to give the organization? In other words, what skills and prior work experience will you offer to a prospective employer? Typically, this information is packaged in the form of a resume and presented in person during the interview process.

2. What do you want to take away from the job? This question suggests that what you get from a job may be something more than just a pay check. While financial income is certainly an important benefit, other types of income are just as important to consider at the beginning of a career.

The purpose of this paper is to examine the second question from the perspective of instructional design interns. We invite readers to broaden their concept of income to include experiential and psychological income in addition to financial income. Our primary goal is to provide a more balanced outlook for prospective interns. However, graduate advisers in performance technology programs and personnel recruiters in business and industry may also benefit as they seek to achieve the best possible placements for their people.

Twenty interns helped define and evaluate the importance of the three income areas: financial, experiential and psychological. Their opinions follow a brief review of current literature on the topic.

Current Literature on Internships

For the Individual

For the aspiring instructional designer, a wealth of information is available on what to expect from an internship, how to manage the internship, and how to develop mutually beneficial relationships with the graduate adviser.
and the training organization. For example, Snyder (1984) proposes seven rules to follow to help ensure a successful internship. The emphasis is on front-end planning (know what you are getting into) and survival (how to take advantage of the relatively risk-free atmosphere to develop yourself professionally). Sink and Sari (1984) also offer practical guidelines for how to conduct yourself during the internship. Their focus is on the costs and benefits to the business and academic communities as well as to the individual.

For Business and Industry

On the business side, a growing number of case studies of operational internship program models have been published (Lance & Fitch, 1983; Bialac & Wallington, 1985). These, too, emphasize the mutual benefits of internships to all parties concerned, and offer the intern proven methods for avoiding pitfalls.

Individuals today are encouraged to validate career choices through the practice of internship.

The most comprehensive resource for prospective interns is a publication by the National Society for Internships and Experiential Education called The Experienced Hand: A Student Manual for Making the Most of an Internship (Stanton & Ali, 1982). Covering everything from how to find an internship to how to celebrate your accomplishments when you're through, this manual is an invaluable aid for interns entering a wide variety of fields, not just instructional design.

The approach taken in this paper differs from those cited above by concentrating solely on the intern's perspective. Interns were asked, "How much of the benefit you received is financial?" "How much is experiential?" Also, "How might you define the so-called psychological income area?"

Three Income Areas

In the spring of 1986, informal interviews were conducted with 20 individuals. Participants were classified into four groups according to their intern or employment status as follows: (a) former interns from Arthur Andersen & Co., who were subsequently hired as full-time educational staff, (b) former interns from Arthur Andersen & Co. who did not join as full-time educational staff, (c) graduate students who were current interns at Arthur Andersen & Co., and (d) full-time educational staff at Arthur Andersen & Co. who previously had completed an internship with another business or industry.

During interviews, participants were asked to describe examples of the three incomes that related to their personal internship experience. The following sections summarize participant responses.

Financial Income

Most participants found it easy to comment on the financial income that they derived from their internships. For those interviewed, total compensation meant more than just a weekly salary. Interns factored in the benefits of low-cost or subsidized housing, the provision for travel and moving expenses, as well as medical or life insurance coverage. Overtime pay and having the option to receive an advance on salary also counted as financial income.

Experiential Income

Participants also found it relatively simple to comment on the experiential income of their internships. This was easy to understand as experiential income may also be translated into program goals. For example, the interns collectively emphasized the value of the following experiences: (a) putting theory into practice, (b) getting exposure to a business/industrial setting, (c) seeing a project through several phases, (d) relating to subject matter experts, and (e) working with real deadlines.

For one participant, the term "income" was not broad enough to describe the benefits reaped. A more accurate description, the individual offered, would be to call the sum total of internship experiences a "career investment." A few participants stressed the value of working on several different projects. For these individuals, diversity meant the opportunity to learn more about the organization by working with a wider range of tasks (from formatting print material to conducting a pilot test) and dealing with a greater variety of people (e.g., managers, graphic artists, and instructors). Others appreciated the sense of closure derived from carrying only one project through to completion.

Participants also coveted the opportunity to cite instructional design experience on a resume. The internship, no doubt, supplied them with this highly prized income—a necessary foot in the door at the start of a career.

Psychological Income

Psychological income was not as easy to define. Additionally, it seemed to require more reflection on the individual's entire experience. However, as with financial and experiential incomes, some trends were apparent.

Confidence building was at the heart of most responses. Specifically, participants gained self-reliance in: (a) producing a professional product, (b) surviving outside the world of academe, (c) working with unfamiliar technical content, and (d) understanding business protocol. Other comments indicated a sense of pride and accomplishment in the tasks that were completed. Participants received a great psychological boost from realizing the marketability of their skills and making contacts for future jobs.

For many, the opportunity to consult with and confide in other interns from different academic programs heightened the value of the experience. One participant commented, "The intern program was structured so that you get to know the other interns. We were housed together and there were social activities planned. The experience of being closely associated with others who were going through the same thing was very beneficial."

And finally, as evidenced by one former intern, the internship helped to validate a career choice: "I understand as a result of my internship how the field of instructional design fits into my whole life. I also learned a great deal about what is important to me in my work."
While the financial and experiential incomes were easier to describe, our conversations exploring psychological incomes triggered more retrospective comments regarding job satisfaction.

Rating the Importance of Incomes

Another goal of the interviews was to find out how individuals would rate the three incomes in terms of relative importance. The assumptions inherent in this evaluation were: (a) There are three types of income, (b) each income may be assigned a numerical value based on its relative importance to the other two, and (c) when added together, the assigned values would equal 100%.

First, participants were asked to rate how important each income was before the internship began. Then they were asked how they would rate each income after their internship. In the case of current interns, "after" opinions reflected their experience to date. This information was used to assess how the internship period might have affected their opinions.

Figure 1 presents mean percentages for the participants we interviewed.

Based on a comparison of the mean percentages for the before and after ratings in Figure 1, it appears that: (a) the importance of financial income decreases after an internship experience, (b) the importance of experiential income decreases after an internship experience, and (c) the importance of psychological income increases after an internship.

During interviews we asked participants to provide a rationale for their ratings. This information provided clues for interpreting the data and, more specifically, for understanding any noticeable shifts in the before and after ratings.

Participants reasoned that financial income was rated fairly high (31%) before their internship because they had not previously held a paid instructional design position. Making the transition from "backpack to briefcase," they were eager to establish a financial standard for themselves. Thus financial income was important. The data show that the importance rating for financial income dropped by about 50% after the internship (see Figure 1). Participants explained that this decline was relative to their greater appreciation for the other two incomes, rather than an actual decline in their interest in financial income.

Experiential income had the highest mean percentage in both the before and after rating categories (56% and 44%). This was reinforced by participants who stated that getting their first instructional design experience was extremely important. In fact, most participants cited "experience" as their primary reason for undertaking an internship. The fact that the rating on this income decreased only slightly (about 21%) is not surprising because many participants realized through their internship...
that broadening their skills would remain a high priority throughout their careers.

Psychological income was rated lowest of the incomes in the before category (13%) primarily because participants were not conscious of it as an income at the time. The data show that after the internship, the importance ratings for psychological income increased by about 200% (see Figure 1). Reasons for this substantial increase focused on the participants’ discovery that psychological income was essential to achieving a sense of success in their work.

Summary

Internships represent a significant career investment supported by both higher education and business. Internship programs seem to offer the type of learning that complements what is learned in a graduate program. For those we interviewed, the internship provided substantial benefits, not only financially and experientially but psychologica1ly as well. Therefore, in planning an internship, it is wise for prospective interns to evaluate what they want from each income “in order that (they) may be happy in their work.”

Appendix

Checklist for Prospective Interns

What’s in it for you? The following checklist will help you evaluate the financial, experiential and psychological incomes you can expect to receive from a particular internship opportunity. Add or delete questions to suit your unique job requirements.

Financial Income (Compensation)

Will the job pay you what you’re worth?

Is there any compensation for housing?

Will you be paid as a self-employed consultant or on salary?

Are there any medical or life insurance benefits?

Will you be compensated for interviewing and moving expenses?

Experiential Income (Job Tasks/Projects)

What kind of projects will you work on?

What types of decisions will you be making?

What specific tasks will you be responsible for?

The three income areas are Financial Income, Experiential Income, and Psychological Income.

References


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Psychological Income (Job Satisfaction)

- What is the corporate climate or work environment like?
- Will you have a mentor or coach to help you along?
- What type of environment or project structure do you work best in?
- How much autonomy will you have?
- Is there room for trial and error?
- What kind of feedback will you receive and how often will you be evaluated?
- How will you measure your successes?
Does Economic Self-Interest Translate into Educational Improvement?

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Abstract. Business/higher education partnerships are proliferating. The motivation behind these partnerships is economic self-interest on the part of both the corporation and the university. Partnerships hold out the opportunity for universities to maintain or improve their research and graduate training programs while corporations can utilize the university facilities to minimize their capital investment. The challenge for the university is to make sure that academic credibility is not foreseen for economic gain.

Whenever we have in mind the discussion of a new movement in education, it is especially necessary to take the broader, or social, view. Otherwise, changes in the school institution and tradition will be looked at as arbitrary intentions ..., at the worst, transitory fads, and, at the best, merely improvements in certain details ...

John Dewey
School and Society, 1900

Introduction

Partnerships between business and education are part of the educational reform movement of the 1980s. They are everywhere. President Reagan has established an Office on Private Sector Initiatives with a Special Assistant whose job is to stimulate business/education partnerships. There is a national magazine about collaborative programs, Pro Education: The Magazine about Partnerships with Education. Eighty chief executive officers from business and higher education participated in the Business/Higher Education Forum which recently published a report entitled, “Corporate and Campus Cooperation: An Action Agenda.” Even American Federation of Teachers President Albert Shanker, a long-time critic of corporate influence on education, has called business and education partnerships “a question of self-interest, rightly understood” (Shanker, 1984, p. 9).

While the private sector has always been involved with higher education in collaborative endeavors, some of them formal contractual agreements, the proliferation of formal partnerships represents a relatively recent phenomenon. Critics have described such partnerships as threats to academic freedom, supporters as a salvation for financially hard-pressed academic institutions. Whether business and higher education partnerships fall into one category or the other, or somewhere along the continuum between the extremes, they are a presence on campuses and merit considerable attention.

Why are such partnerships “all the rage”? What factors are motivating their proliferation? What are the promises and pitfalls in business and higher education partnerships? How can universities achieve their stated promise while avoiding the oft-reported pitfalls? The purpose of this article is to address these questions and to speculate on how to place partnerships into the “broader, or social, view” such that their use will enhance the quality of education rather than serving as only “arbitrary inventions or transitory fads”.

Origins of Business and Education Partnerships

The proliferation of business and education partnerships has its origins in the changing structure of the American workplace. Business has come to the realization that education is not meeting the needs of corporate America. The changing business environment requires new technological and managerial skills, an expanded fundamental and applied research base, and a greater global presence in order for the U.S. economy to compete effectively. A 1983 report by the Business-Higher Education Forum examined the declining competitiveness of U.S. industry and called for improvements in technological innovation and educational programs to strengthen the U.S. presence in world markets. (Business-Higher Education Forum, 1983).

Higher education has suffered from declining federal and state support (spending for higher education dropped by 12.6% in real terms, during the high inflation period 1973-1983) and an eroding population base from which to draw students and generate tuition income. Outdated research and instructional facilities and deteriorating faculty salaries have undercut the ability of Universities to maintain a position of excellence in the areas of research and teaching and have jeopardized the retention of outstanding faculty members. (Business-Higher Education Forum, 1984).

The self-interest motive drives business to focus increasing attention on employee education, especially that of middle managers. The corporate sector, facing competitive pressures, has established many of its own training and development programs because academic institutions were not responding to the business sector's educational needs. In-house training essentially challenged higher education's monopoly on graduate education. Company-run training programs such as the Wang Institute, Xerox's Center for Training and Management Development, and Arthur D. Little's graduate level training institute offer high quality, field-specific training in ultra-modern surroundings utilizing up-to-date educational technology. But such programs cost the private sector between $30 billion and $40 billion annually. Economic reality suggests that, except for some financially flush firms or those with particularly
narrow training needs, it is more cost efficient to invest minimally in in-house training, and leave the bulk of training to academic institutions.

Institutions of higher-education, especially some of the smaller private schools which have been particularly challenged by financial constraints, have themselves responded to the perceived demand for training related to corporate needs by designing programs to prepare skilled business professionals. Such programs, although financially remunerative, are questioned by many educational leaders. Ernest Boyer, President of the Carnegie Foundation for the Advancement of Teaching, worries that the pressures of the marketplace may lead to student-driven programs requiring “a minimum of effort and with no clearly defined core of demanding studies” which will ultimately devalue higher education (Boyer, 1983, p. 32). Boyer’s criticism is concerned more with the quality of program design than with the notion that higher education should respond to the changing world of work.

Scope of Partnership

Business/higher education partnerships are different from both the corporate sector’s own graduate training and the hastily developed professional training programs offered by some colleges and universities. The former programs are too expensive and the latter do not carry prestige or allow access to the research skills of faculty at major research universities. Instead, corporations are taking advantage of the facilities and personnel within academic institutions and entering into cooperative arrangements to achieve their stated goals. The phenomenal success of Genentech, the California genetic engineering firm that began in Berkeley, has encouraged collaborations because it demonstrated that the ivory-tower university and the bottom-line corporation have a lot to gain by working together. Examples of partnership programs abound, but several are worth mentioning for purposes of illustration. Worcester Polytechnic Institute and Emhart Corporation, Pace University and AT&T, and University of Vermont and IBM have developed cooperative programs in which university faculty design training to meet the needs of the firm. Such programs incorporate firm-specific needs without sacrificing academic rigor.

Research initiatives include the Center for Excellence in Engineering established by Arizona State University in conjunction with Motorola. IBM provided multimillion dollar gifts of equipment to various universities. The Bechman Corporation sponsored a post doctorate training program in molecular biology at the University of California at Irvine. Exxon and MIT entered into an $8 million agreement for research into the combustion process. In many cases, the university will share with the corporation in royalties. While these programs continue to draw criticism from some academics because they allow “outsiders” to influence the content of academic programs or because they jeopardize fundamental research by focusing on product development, such partnerships can offer faculty members the resources to take full advantage of the stimulating, self-initiated intellectual environment of the university. They can prevent an academic brain drain and provide the foundation for improved instruction. Evidence exists that with clear guidelines such cooperation can prove to be beneficial to the university and to the corporation (Serferis and Williams, 1984).

Such cooperative endeavors need not focus exclusively on large corporations. In Minnesota, New York, and Vermont, the state legislatures have allocated funds to link colleges and universities with small businesses. In most instances, this cooperation is primarily the provision of expertise by faculty members to new or struggling small businesses. In some cases, the small business and a university-based center collaborate to undertake a new project or to market a product or service. Under either arrangement the cooperation can serve as a research stimulus or as a faculty renewal project.

Motivation for Cooperation

The corporate sector’s graduate programs and the preponderance of business and higher education partnerships have evolved in the areas most pressured by changing economic and technological conditions. Business administration, strategic management, computer information systems, and engineering research were the first sub-disciplines to feel the challenge of corporate initiatives (Staff, 1982). Other areas within higher education are now faced with the opportunities and the challenges of these initiatives. Within education, partnerships are appearing at the college and university level after years of experimentation at the elementary and secondary school levels. We can gain some insight into the promises and pitfalls of cooperative arrangements by looking at the partnerships developed between businesses and the public schools, many of which are facilitated by college-based programs reaching out to these schools.

Realizing that the quality of their labor force depends on the quality of instruction in America’s schools, businesses are taking a leadership role in promoting excellence. Ranging from the adopt-a-school program involving over 15,000 schools and 46,000 companies and agencies, to Burger King Corporation’s Teachers and Principals Recognition Symposium, to Control Data Corporation’s gift of computer equipment and training to a suburban Minneapolis district, the corporate sector is using incentives to improve elementary and secondary education. In some communities where teacher shortages are particularly acute, business and community groups are offering travel funds and free rent to attract new teachers and are advertising “signing bonuses” to at-

In-house training essentially challenged higher education’s monopoly on graduate education.
tract experienced teachers. These initiatives, and the many hundreds of others which abound in this country, stem from a realization that a measurable pay-off accrues to business because of better community schools (Cohn, 1974). These kinds of programs encourage change rather than dictate curriculum.

In other instances, firms are supplementing the public school curriculum. American Express Company developed a program called the Academy of Finance in the New York Public Schools. The program has since expanded to Arizona and Minnesota. Students take a special curriculum including courses in computer programming, business practices and accounting, in place of the regular curriculum during their last two years of high school. For participation in the program they are guaranteed summer employment with financial firms in their communities. This program places high priority on career development albeit only in terms of careers in the financial industry.

**Strategy for Evaluating Partnerships**

Business/education initiatives hold great promise but they also present some pitfalls. How can Colleges of Education take advantage of partnerships to promote career development opportunities to enhance the quality of teacher training and to improve educational programs in K-12 classrooms?

A major consideration for maintaining academic integrity while gaining the leverage provided by corporate incentives is to provide distance between the corporate contributor and the educational program development and delivery. This does not imply ignoring the expertise of corporate managers or trainers, but it does mean that such expertise should fit into a thoughtful approach to curricular change and innovation. This will help guarantee that the effective decision-making process within the university will continue to provide professional academic oversight to program development and curricular change. In reviewing business/higher education cooperative programs, faculty members need to focus on the word "cooperation" so as to avoid an abdication of their responsibility to produce and transfer knowledge within an academically sound context.

For years the national economic education network has successfully executed this delicate balancing act. Over 250 college and university-based centers for economic education deliver programs in schools and for various community groups. The bulk of the dollars to support this program delivery comes through contributions from business and many programs are delivered in a cooperative fashion. The dollars are generated by an umbrella group in each state called a council on economic education. The council provides the bridge between the funding agency and the university-based program development and delivery. The bridge also functions as a buffer to ensure that the contributed dollars do not unduly influence programmatic content. The private sector and the university community combine to explore the areas of greatest educational need. University faculty use the suggestions from the business community to develop programs themselves. Funding flows from agreement on an educational need and a recognition that faculty are in the best position to devise ways to meet this need. The dollars do not drive the program—the perceived need leads to program development which generates the contributions.

Within higher education, faculty and administrators must ensure that thoughtful reflection establishes the programmatic agenda. Private sector input through partnerships can provide valuable assistance without dictating program content when institutions of higher education establish the direction for educational improvement.

Some examples of partnerships which meet this criterion are scholastic for corporate executives to participate in university programs, funding for scholarships to attract outstanding students into the teaching profession, faculty-executive exchanges to provide a cross-fertilization of ideas, funding for general research programs which are administered by the university, pre-service teacher practice within corporations rather than just in schools, and undergraduate and graduate internships in corporations, government agencies and non profit agencies.

Out of this entire issue emerges the notion that economic self-interest is the motivating factor behind the corporate sector's desire to form partnerships with higher education. In most instances colleges and universities are responding to these corporate initiatives for the same reason. The challenge is for faculty and administrators to utilize the economic motives of corporations as a vehicle for educational change which is systematic and credible so that the end result is more than "arbitrary inventions."

**References**


Higher Education and Business Relations: The Case of the Education Utility

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Abstract. The Education Utility, a project of National Information Utilities Corporation and AT&T, is an electronic delivery and management system that will provide instantly, to the desks of educators and learners, located anywhere in the world, massive quantities of continually updated instructionally interactive information, and will permit a high level of networking among users. The two corporate entities involved in this information technology project have established certain linkages and joint activities with higher education institutions. The nature of these existing and planned linkages is described, together with some lessons that have been learned about this business-university relationship thus far.

Introduction

There appears to be a growing interest in relations between higher education institutions and businesses as evidenced by the availability of both descriptive and analytical literature on the topic (Parnell & Yarrington, 1982; Mathews & Norgaard, 1984; Lynton, 1984; and Industry and university: New forms of co-operation, 1984), as well as in journals (Nelkin & Nelson, 1986; Levinson, 1984; Mai, 1984; Varron & Kikich, 1985; Kornhauer, 1984; and McDonald, 1985). A review of the Current Index to Journals in Education (CIJE) entries on university-industry relations reveals numerous articles on the topic. In one casually selected six-month cumulative index of CIJE (January-June, 1985), for example, about ten citations were found related directly to university and/or college and business/industry relations. This literature expansion follows, of course, from an increase in the number and kinds of relationships that have developed between higher education and business during the past decade or so.

The reasons for this increase in cooperative ventures are many, but the primary motivation is the recognition by educators that the resources of business are essential to the continued health of higher education, and the corresponding realization by businessespersons that the future of business enterprises may be enhanced if business works more closely with higher education institutions on research, development, and training efforts. In the best of cooperative relationships, everyone benefits. There is a growing awareness that the current and future complexities of our global society require that virtually all sectors of society learn how to work with the other sectors to ensure survival in a highly interdependent world.

While an increase in university-business relations delights many higher education officials, the situation worries others. There are concerns that our institutions of higher education are being "bought out" by business, and that the historic role of higher education in society is thus being compromised or eroded. Other educators see the links with the business community as a logical and necessary approach to addressing major social and economic issues in society. As the debate about the appropriateness and/or desirability of a higher education/business relationship goes on, the relationship itself continues to grow.

This paper contains a preliminary analysis of one higher education/business relationship that is in the early stages of development. The relationship seems worth examining even at this early stage, for the ultimate character of this particular relationship could be both highly complex and massive in scope, and could have tremendous impact on both business and higher education. The business entities involved are a small corporation called National Information Utilities Corporation (NIU), and a larger corporation called American Telephone and Telegraph (AT&T). These two corporations are working together to create a system called the Education Utility. There are several institutions of higher education involved in this venture with more joining up in the near future.

Following a brief description of the project known as the Education Utility, a review is presented of current and projected future activities involving the corporate and higher education participants in the development of the Education Utility. Some preliminary lessons about higher education/business relations learned from the Education Utility project are presented.

The Education Utility

The Nature of the Education Utility

The Education Utility is an electronic delivery and management system that will provide instantly, to the desks of educators and learners located anywhere in the world, massive quantities of continually updated instructionally interactive information (software programs, databases, sophisticated graphics capabilities, news services, electronic journals, electronic mail, and a host of other kinds of instructional and administrative materials). The technologies to make this kind of information resource base available to learners are complex, yet designed to be virtually "invisible" to the user. Given space limitations in this article, it is impossible to spell out in great detail the technologies involved, but a very brief overview of how the Utility system works may be helpful to the reader. For those interested in more details about the technology and how it works, consult a recent volume by the author (Gooler, 1986).
Components of the Education Utility System

All of the information resources mentioned above (a constantly expanding and dynamic set of materials), as requested by a particular teacher or learner, will be stored and accessed through a main "server" computer at individual educational sites (such as a classroom in an elementary school or university, continuing education center, or business). These local host computers will be directly connected to another, larger central computer called the Network Control Center, that will serve as the main storage reservoir for all information in the Education Utility system. This connection will be made through "electronic highways," telecommunications channels (such as those available through satellite broadcasting) that are most easily and inexpensively accessed by a given local site. The transmission of information resources from the main network control center to the local sites will occur in "real-enough time," when telecommunications costs are least expensive. It should be noted that these electronic highways are already in place, but are not used extensively during the evening hours. Tremendous amounts of information can be moved along this highway, at relatively low cost.

At the local site level, individual users of the Education Utility will gain access to the information resources in the Utility through microcomputer terminals. Each terminal will have tremendous computing power in and of itself, so that instructional and information resources that are accessed by the individual user can be manipulated using the computing power in each microcomputer or terminal. In any given setting, each learner could be working on a different database or educational program, or groups of learners could be working on a common program or information resource. The combinations are virtually endless. Teachers will thus be able to truly individualize educational programs for all learners, while maintaining a capacity for groups of learners to work together. In order to make this all feasible, the Utility will contain instructional management capabilities that will permit teachers to manage effectively the learning progress of all learners, even when each of those learners is working on different programs, at differing rates, and with differing outcomes. The system will also contain the administrative software necessary to permit teachers, administrators, and learners to track academic progress, report results to appropriate parties as needed, and in general, manage an instructional environment that features individualized, self-paced instruction.

Another critical component of the Education Utility is the electronic mail feature. The Utility will permit learners to communicate with each other through quick, inexpensive electronic mail almost anywhere in the world. The learning and cultural development prospects available through such a networking capacity are virtually without precedent.

Figures 1 and 2 contain a general depiction of the Education Utility system.

Benefits of the Education Utility

The Education Utility, through its integration of technologies and its vast information resources, as well as the tremendous computing power it makes available to each user, will provide numerous education and information benefits to all learners, whether they are elementary school children, adults studying for another profession, researchers, or anyone who needs information to carry out progress toward some desired goal. Teachers will be available to guide learner activities; children with handicapping conditions will be able to study at their own pace; instructional materials will always be current because they can be regularly updated and made available to all users; all learners will have access to the world's information resources, and thus be freed from the constraints imposed by local conditions. These are only a few examples of the benefits to be gained from using the Education Utility. For a more detailed example of how the utility might work see Gooler, (1986, p. 37).

The Education Utility will have profound impact on what goes on in elementary and secondary schools in America, but the application of the Utility goes much beyond that single, albeit very large enterprise called elementary and secondary education. The Utility also has tremendous implications for what goes on in continuing professional education, in international education and information sharing, and in corporate education. The Utility has definite potential applications in higher education, in vocational and career counseling centers, libraries, prisons— anywhere information is needed, analyzed, used. The Education Utility represents nothing less than a vehicle for a significant transformation of education and a host of other service areas, such as agriculture and health care delivery.

The reader may be able to see from this cursory description of the Education Utility that what is being proposed in this system is profound and comprehensive. The Utility represents what may be the first important step into the Age of Information or, as the founder of the Utility, Jack Taub, likes to say, the "Age of Intelligence." Virtually all sectors of society will be influenced by this development. It is thus apparent that the relationships developing between the Education Utility and higher education institutions can be of great consequence and complexity, and can enhance the business/university relationship further.

In the next section of this paper, some of the kinds of cooperative activities that have developed thus far are outlined, together with some projections for additional near-term activities.

Cooperative Activities

The development of the technological aspects of the Education Utility began nearly eight years ago when Taub first created National Information Utilities Corporation (NIU). During the early years, efforts by that corporation appeared to focus on two main events: defining the scope of the Utility concept, and developing the necessary hardware and software inventions that would make the concept practical. Relatively little attention appears to have been paid

The Education Utility is an electronic delivery and management system that will provide massive quantities of continually updated information.
to many specific educational or instructional aspects of the concept. The Education Utility concept was not conceived by an educator, but by an individual who, having never completed a formal high school diploma, had nonetheless achieved a great deal of success as a businessman and entrepreneur. (Taub was a founder of The Source, and was the owner of the Scott stamp collecting company.) The initial concerns of the business persons involved in creating the Utility were of necessary technical concerns. If the technical problems could not be solved, then the dream underlying the concept could not be pursued.

**Proposed Future Linkage Activities**

To date, the relationship between the Education Utility project and institutions of higher education, has focused primarily on higher education providing consultation to NIU and AT&T about a number of instructional and implementation aspects of the Education Utility. Those developing the Utility have asked for advice and guidance and higher education has been responsive to the request. There are, however, plans for very different kinds of cooperative relationships in the future, including the following:

1. **Research and Demonstration Centers.** A number of research and demonstration centers have been established and operate as partnerships between colleges of education and elementary or secondary schools, with the active involvement of personnel from AT&T and NIU. These research and demonstration centers will engage in a number of activities, including:
   1. The main activity of each center will be to use the Utility. Each center would thus have as a primary mission to demonstrate the various ways the Utility could be used in a given educational setting.

   All of the information resources will be stored and accessed through a main "server" computer.

   Representatives from NIU attended that meeting. Further, a follow-up meeting was held in conjunction with the American Educational Research Association Meeting to gain feedback from higher educators as to how the Utility might best be designed to facilitate educational research.

   3. Higher education personnel have been involved in discussions in several states about shaping a state-wide plan for coordinated implementation of the Education Utility. It is expected that these kinds of planning efforts will eventually be undertaken in many states; higher education representation in these planning efforts has been and will continue to be of critical importance.

   2. While using the Utility, each demonstration center would be expected to evaluate the various uses of the Utility, and make the results of those evaluations available to AT&T/NIU personnel, as well as to interested others.

   3. The demonstration centers would provide a setting for the conduct of a range of research activities focusing on the uses of integrated learning technologies. Investment in research is critical to the long range success of the Education Utility. It is expected that many agencies, institutions, and/or individuals would use the research and demonstration centers to explore important issues germane to learning technologies.

1986, VOL. 9, NO. 3
The Utility represents the first important step in the "Age of Intelligence".

4. Research and demonstration centers will also be busy with development of new information and instructional resources, and with the exploration of alternative instructional strategies made possible by the Education Utility.

5. Communications will be one of the major activities of the centers. The centers will be hubs in the electronic flow of information among centers, between centers and other Utility locations, between centers and staff and researchers, and a host of other linkages.

These are only a few of the activities the research and demonstration centers would undertake. These centers would thus serve as a substantial linkage between the education and business communities. The education community will clearly benefit from the centers' research related to the uses of integrated learning technologies. The business partners, AT&T and NIU, will profit from a continuous flow of evaluative and research information that will enable the corporations to make improvements in the system.

Academy of Learning Technologies. Another important future relationship between business and higher education as regards the Education Utility will take the form of an entity called the Academy of Learning Technologies. The Academy, a non-profit organization, will be guided by a Board of Directors composed of educators and businesspersons. The Academy will provide a unique national and international forum for the exploration of matters related to the uses of learning technologies. The Academy will essentially be a major think tank for expanding our knowledge bases about how technologies in general, and the Education Utility in particular, can be more effectively used to further educational goals. The Academy, among other things, will provide Utility users with a source of both theoretical and practical ideas for how to use the Utility, and will also serve to stimulate research, evaluation, development, and training activities that will benefit any educator attempting to use emerging information technologies.

In time, as available revenues expand (through usage fees, grants, etc.), the Academy could host a significant number of scholars and researchers in residence for study at the Academy. Eventually, it is anticipated that the Academy will financially support some number of these researchers, who come to the Academy to study topics included in the Academy's long range research agenda. Other scholars might be supported by the Academy to explore topics proposed by those scholars. The Academy might also serve as a site for higher education scholars who wish to spend a sabbatical leave in residence. The intent of these activities, of course, is to create within the Academy a community of scholars from a variety of disciplines and institutions, and to mutually explore issues of importance to understanding the future of learning technologies. Such a community could benefit both higher education and business partners.

As noted earlier, it is evident that a project as large and complex as the Education Utility will require massive amounts of training to be available to teachers, administrators, learners, and others. In the training area, it is planned that close working relations be developed between Utility officials, and various higher education institutions. At the time of this writing, a "training committee" sponsored by NIU is being established to develop a long range plan for accomplishing the myriad training necessary to support the Utility project. Higher educators will play a prominent role in that training committee and in subsequent training efforts.

National Information Utilities Corporation has determined to establish a number of substantive advisory councils to provide NIU with the kind of ongoing counsel necessary to make sure educational issues are clearly understood and considered by those people designing and operating the Utility system. One such advisory council will focus on the uses of the Utility in higher education institutions and programs.

It should be evident that the very nature of the Education Utility concept is complex, and must involve literally all sectors of the education community, including higher education. The opportunities for partnership between higher education and the Education Utility are thus not simply theoretical, or a nice idea, but essential if the project is to be successful. What may be unique about this entire effort is the amount of intertwining that already exists, and that must continue to exist in the future, between higher education and the business partners in the Education Utility. This is a partnership not merely of convenience or superficiality, but of genuine cooperation and mutual interdependence. Neither partner can survive very well without the other.

There are many examples, however, that suggest that mutual interdependence does not always guarantee effective or quality partnerships, particularly in an enterprise as complex and influential as the Education Utility. Given that caveat, and even at this very preliminary stage in the partnership between higher education and the business partners in the Education Utility, some lessons learned about partnership building may be worth examining briefly. Some of these lessons are described next.

Lessons Learned: A Preliminary Analysis

It is, of course, somewhat premature to speak of all that has been learned about university-business relations surrounding the Education Utility project, but some preliminary observations might be made about these relationships. Six such observations follow. To facilitate this discussion, the term partners will be used; this term will refer to AT&T and National Information Utilities Corporation as the business partner, and higher education institutions in general as the education partner.

At the outset, both partners may have felt they knew more about the other partner's business than was warranted. That is, the business partner seemed to express a good bit of understanding of the education system, and the educators a good bit of understanding of the hard-
new perspective to how schools specifically, and teaching and learning more generally, might work in light of tremendous technological alternatives available in the emerging information society. The business partner, on the other hand, appears to be developing a much greater sensitivity to how the education system works, and to how to approach that system in a way that will be constructive rather than destructive. In some respects, it might be said that both partners have profited by learning how to bring about positive changes in the character of education which bodes well for the likely success of the Utility concept.

A range of talent exists within both partners in this venture. That is, one can find highly skilled and competent individuals working in both the business and education sides of this activity, but one can also encounter people who are mediocre at best, perhaps even bordering on incompetent, working within both the education and business partners. The point seems rather mundane, but in the day-to-day development of relationships, it is vital that each partner recognize the variability of talent likely to be found in the other’s resources. It is thus important that each partner neither assume that the other partner’s professionals are all of exceptionally high quality, nor that everyone on the “other side” is automatically of limited quality. Failure to recognize the array of talent in both partners will lead either to unfortunate self-fulfilling prophecies, or unrealistically high performance expectations that simply cannot be met. Either extreme will jeopardize the long range success of the project. In the Utility venture, some of these adjustments in perceptions and/or expectations about the quality of personnel have had to be made.

The Education Utility experience to date strongly suggests that three characteristics must be present in both partners if a university/business partnership of the magnitude of the Utility project is going to work: patience, persistence, and persuasiveness. Without these characteristics operating on virtually every level of the partnership virtually at all times, the partnership is likely to fall apart. Almost everything takes longer to happen than was forecast, so patience is necessary. In a partnership, the wires of communication sometimes tend to cross, resulting in a certain degree of chaos. Persistence and follow-up are constantly needed. And each partner must constantly, but in a constructive manner, seek to persuade the other partner of the appropriateness and/or desirability of doing things a certain way. The creative tension involved in this kind of ongoing persuasive dialogue is what supplies the energy for an important joint project. Of course, going to extremes in attempting to persuade, without also being willing to compromise, will result in disaster, but positive approaches to persuasion make a partnership strong.

Finally, it is fair to conclude from the experience of partnership building in the Education Utility project that it takes a number of iterations before each partner fully understands the other, and before a common understanding about goals and strategies is achieved between them. This is particularly true in a project of the magnitude of the Utility. Both partners need to reexamine continuously each other’s perceptions of what goals are being sought. Language certainly enters this process as the education and business partners struggle first to understand each other’s words and then the meaning of what is being said. Initial assumptions need to be checked, processes clarified, ends enumerated in the language of each partner. The partnership is likely to succeed only to the extent that commonality of purpose can be finally achieved.

These, then, are some of the lessons being learned about establishing partnerships between business and higher

All sectors of society must learn how to work with the other sectors to ensure survival in a highly interdependent world.
education in a project that is of great consequence to both business and higher education. This particular partnership is relatively new, so there is much more to be learned. Because the stakes are so high, it is essential that each partner continue to learn from the other. Educators need to listen carefully as the business partners talk about how to make schools profit centers, how to capture the entrepreneurial spirit of educators and citizens in general, how to get the many sectors of the education community to come together for purposes of solving difficult educational problems. Business persons need to listen to the voices of higher education personnel who are concerned about the quality of the instructional design characteristics of the information resources made available through the Utility, of the issues of education equity that are raised by the Utility, and of the magnitude of the challenge of training educators and learners to use the power of the Utility effectively. There must be a climate of trust and mutual respect if this partnership is to work.

The signs thus far are good. The Education Utility could prove not only to be the vanguard of a substantial transformation of the education system, but also a model for a positive and productive partnership between education and business on a scale unprecedented in the annals of education history. Time will tell if the promise becomes reality.

References


The Education Utility is a model for a positive and productive partnership between education and business.
The Corporate Training Department as a Clinic for the Study of Instructional Design

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Abstract. Researchers can design productive studies that are both attractive and feasible to corporate sponsors. To do so, researchers should first characterize the host training program as follows a reactive strategy, cost center strategy, or human capital strategy. Each strategy carries implications for the type of research that is most likely to be of interest. Designs using naturalistic inquiry, comparative studies, or experimentation may be feasible in certain circumstances. Sample research topics are given, and guidelines for initiating contact with corporate research sponsors are proposed.

With the private sector's emergence as the dominant employer of instructional designers, those concerned over the future of the field have noted the apparent lack of opportunity for sound research in business settings, particularly research involving controlled experimentation. Furthermore, rewards for research publication in the private sector generally are minimal, so there is little incentive for serious work. The situation contrasts with that of academically-based instructional designers who are rewarded for research and publication but who often lack the resources of business settings and find it difficult to design studies for business settings that are both feasible and attractive to potential commercial collaborators.

The situation need not be so bleak. Many opportunities for research exist in the private sector, even when conventional controlled experimentation is not feasible. Such research is practical for joint academic-business projects, but it also can be conducted by commercial developers alone. To see why this is so, three "typical" corporate views of the training function and their implications for research opportunities will be summarized. These, alternative research strategies will be examined and discussed with regard to how they might be applied in corporate settings. Finally, suggestions to prospective academic researchers will be made on how to facilitate communication with potential corporate research partners.

Resources and Constraints for Corporate Research

To design research for corporate settings that is both attractive and feasible, researchers must first understand how training is strategically positioned within corporations. Working from Gilbert's (1979) analysis, three alternative strategic positions may be identified: the "reactive" strategy, the "cost center" strategy, and the "human capital" strategy. Each of these will be examined, then conclusions will be drawn for how to design and justify research.

Reactive Strategy

Many corporations regard training as an incidental expense. Authority for training decisions is dispersed to line managers, and there is no central accounting of training expenses. In this setting, training expenditures often are a reaction to a short-term problem. It is expected that the training will somehow address the problem, but often there is little careful evaluation of the link between costs and benefits. The relationship of training to long-term strategic goals is undefined. If a corporate training center exists, it may be seen as merely one of a number of alternative training vendors. It may even operate on a chargeback system.

Cost Center Strategy

Another strategy views training as a cost center: an activity the business needs, but which does not generate income. In addition to training, examples of cost centers are finance and administration, computer centers, and office buildings. Cost centers usually are justified as a means of cost avoidance: spending money on the cost center now will avoid a greater cost later on. When training is managed as a cost center, there usually is some centralized accounting system to track training costs. Centralized administration of training is common, sometimes requiring that individual training programs be justified in terms of cost avoidance. However, benefits other than cost avoidance are not tracked. In principle, evaluation of training programs in such a system is done by tracking a given cost before and after the training.

Human Capital Strategy

In some organizations, training is seen as a means of developing the capacity to achieve certain specified corporate objectives. In such cases, training can be justified as a means of achieving a specific strategic objective. It is an investment (in the people of the corporation) that produces a return when the objective is achieved. It is justified by comparison to alternative investments directed at the same objectives such as outside purchase of component products or services, or hiring of people who require no training, both of which come with a higher price than in-house products or personnel.

While training managers might acknowledge this three-way distinction, the terms themselves have no particular currency. Nonetheless, different approaches to research seem logical for each of the three strategic positions.

Reactive training environments are probably least receptive to research aimed solely at theory building for instructional design. Effectiveness of alter-
native designs for training usually is not a salient concern of managers in this environment. They often do not recognize the indirect costs of unsystematic training, and they may be unaware that there is an alternative. However, managers in such settings sometimes are concerned that they may be failing to recognize training needs that will somehow intercede with their success.

Opportunities for research in reactive settings thus may center on case studies of needs assessment and cost modeling. If hidden training costs or unmet training needs can be presented as potentially severe risks to project success, then the manager may agree to a needs assessment or a cost study as a means of managing project risk.

Training programs strategically positioned as cost-centers may offer a wider range of research alternatives. From the training manager’s point of view, training managers usually learn the required skills whether or not good instructional design (ID) is used. The advantage of ID is that the results will be achieved more completely, more quickly, or at lower cost of delivery. Training programs positioned as cost centers often emphasize standardized development methodology, and they may be quite sophisticated in measuring the costs of development and delivery against measures of training effectiveness.

Opportunities for research in cost centers may center on any theory-building activity that leads to improved prescriptive power in design, particularly if the result will be reduced training development costs or reduced delivery costs (including time). In addition, research into improved measures of cost or effectiveness should be of interest. However, interest in research on improvements in instructional effectiveness (with no associated development or delivery cost reduction) may be limited to areas of content where present training is perceived as ineffective.

Training programs that are justified as investments in human capital have most of the interests of the training cost center, but the strategic focus on corporate objectives dominates. Thus, evaluation of program effectiveness is likely to include measures of achievement of corporate strategic objectives, whereas conventional learning outcomes measures will be viewed only as an intermediate indicator of success. Interest in cost reduction will be high. However, interest in improvements in training effectiveness may also lead to improved achievement of corporate objectives, even when the result is increased cost of training development or delivery. In other words, if the increased investment in training can be shown to lead to even greater returns on some corporate objective, the investment will be justified regardless of its size.

Opportunities for research in human capital programs are likely to center on theoretical advancements in design that may lead either to reduced cost or enhanced performance. In particular, there is likely to be interest in research on methods of modeling the cost-benefit relationships of training, where benefits are expressed as contributing to achievement of corporate objectives, rather than merely achieving learning outcomes. There may be a willingness to invest in new methods or technologies of design or delivery if there is promise of enhanced or expedited achievement of a corporate objective.

Thus far, the discussion has focused on training departments that are part of a larger corporation. However, the argument can be extended by analogy to profit centers, divisions or whole companies that develop, produce, and sell education and training products and services. Ideally, perhaps, profit centers should view their sophistication in design methodology as one of the fundamental technologies upon which their business is based. In this case, the company should view investment in the technology in much the same way as the human-capital corporate training department. The reality, however, is that profit centers appear to be oriented in all three strategic directions. Thus, their interest in research may vary in ways analogous to the three positions described above.

### Alternative Research Strategies for Corporate Settings

The obstacles to controlled research in corporate settings are often similar to those found in other instructional development settings. Control groups receiving no treatment are extremely difficult to obtain, random assignment of learners to groups often is difficult (though not impossible), and development of alternative treatments often is prohibitive given tight project schedules.

However, exceptional conditions occasionally exist that allow researchers to circumvent many of these constraints. Furthermore, research strategies that circumvent these obstacles may be quite feasible. This section will examine three such strategies that are currently in use at Advanced Systems, Inc. (ASI).

### Naturalistic Inquiries

Researchers have many options for case studies involving data collection by naturalistic means such as observations, studies of project records, and the like. With appropriate guarantees of competitive security and anonymity, researchers often can gain access to data such as:

- Observations or records of meetings and classes
- Interviews with development personnel and learners
- Project time logs and correspondence
- Budgets
- Intermediate design deliverables
- Utilization figures
- Learner data, including achievement data
- Course evaluation data (objective tests and subjective ratings)
- Standards manuals
- Contracts

Furthermore, in large organizations these data can be obtained for more than one project. Thus comparisons between projects are possible.

Naturalistic inquiry methodologies have been used at ASI in two doctoral dissertations, and a third one is presently under way. The present study, for example, is a study of the decision-making process used to plan and deliver internal...

Both academic and industrially based instructional developers share responsibility for theoretical development of the field.
training (R. Torres, Personal Communication, May, 1986). ASI also keeps many of the types of data listed above for ID projects completed over the past eight years, so many comparison studies are possible. For example, a basic principle of instructional design is that careful front-end analysis offsets costs later in a project and leads to better quality. It would be interesting to examine how investments of development time and resources at various points in the process relate to overall project cost, product quality and success in the market place.

Comparative Studies

When a new design technique or delivery technology is introduced into an ongoing training program, the opportunity exists for a comparison between the new and the old. In some cases, it might be possible to deliver both the new and the old simultaneously. In other cases, a time series design may be possible. For example, ASI recently completed a prototype study design (Foshay, 1986) that will be used for a series of studies comparing design and delivery variables associated with three instructional strategies (video/stop, interactive video, and live classroom). Principal dependent variables are time to criterion, degree of mastery, cost of delivery, and subjective impression of the instruction. The principal independent variable is instructional strategy. The design calls for instructional content to be controlled and learner differences to be randomized. As studies are completed, it should be possible to draw some insights about how various design variables influence learning outcomes, even though systematic variation of each individual design variable will not be feasible.

Experimentation

In some cases, academic researchers may be able to obtain commercial materials for direct experimentation. Much corporate training is situation-specific and proprietary, and would not be suitable for use with research subjects such as college students. But this is not always the case. ASI, for example, is now a vendor of computerized training systems as computing. Self-instructional courseware on topics such as basic computing concepts and programming could be used with college students, and the resources available in an academic setting would be sufficient to modify attributes of the courseware such as presentation and practice strategies.

In other cases, comparative assessment of competitive self-instructional products may be possible in an academic environment. For example, academic studies have occasionally been commissioned to comparatively evaluate computer-based training products teaching an introduction to the same popular software product. Such comparisons might draw conclusions about relative effectiveness of various design strategies.

Many of the current areas of greatest research interest in ID could be addressed by using one or more of these strategies. Table 1 further illustrates the point by listing three possible studies that would contribute to development of theory in the field. For each, a note shows how the study could be accomplished using one of the three research strategies.

<table>
<thead>
<tr>
<th>POSSIBLE STUDY</th>
<th>RESEARCH STRATEGY</th>
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<tr>
<td>1. Development team structure and function, and the process consultation model.</td>
<td>Naturalistic study of a project involving team members such as designer, subject matter expert, writer, producer, evaluator, etc.</td>
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<tr>
<td>2. Comparison of algorithmic and heuristic strategies for teaching problem-solving skill such as troubleshooting.</td>
<td>Comparative study of two or more training products, one designed with an algorithmic strategy, and the other with a heuristic strategy.</td>
</tr>
<tr>
<td>3. Effectiveness and appeal of varied levels of learner control.</td>
<td>Experimental study using treatments prepared by modifying computer software controlling an interactive videodisc supplied by a commercial vendor.</td>
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Improving Communication in Joint Research

Because joint research projects in commercial settings are still rare, neither academic researchers nor industrial training managers are at ease in communicating. Researchers seeking to build links with industry may be able to facilitate such communication by applying some basic guidelines drawn from the above presentation. In addition, both business and academic researchers can take steps to simplify the requirements for administration of such projects. This section will first propose some guidelines for facilitating communication with prospective commercial research sites. Then it will discuss ways of simplifying the administration of research projects.

Guidelines for Communication

Drawing from the presentation above, some suggestions are made about how to improve communication, particularly of initial research proposals.

* Determine the strategic focus of the training organization. A few questions can help reveal if the training organization focuses on a reactive strategy, a cost center strategy, or a human capital strategy.
Researchers seeking to build links with industry must learn to facilitate communication with prospective commercial research sites.

- Propose a research project with strategic benefits to the organization. Using the observations above, attempting to match the research objectives with benefits of strategic interest to the organization may improve the chances of research project success.
- Emphasize the strategic benefits of the research to the organization. Once the strategic focus of the training organization is known, and an appropriate project has been selected, begin the proposal by emphasizing the benefits of collaboration to the organization. This will help the training manager cost-justify support of the project.
- Explain the features of the project and its cost in terms appropriate to the audience. Unless the training manager has a research background, he or she is likely to be uninterested in the methodological details of the research design. Interest is more likely to focus on the basic structure of the study, what it will and won't say, and what it will cost in time, dollars and other resources.
- Document the proposal with a two-page executive summary of the above points, supported by a detailed study design if necessary. The executive summary should be written in layman's terms, and should emphasize the points above. The detailed study design may be a technically worded document, if necessary.

Simplifying Administration of Projects

Businesses are experienced at contracting for goods and services, but the special requirements of joint research often are unfamiliar. By contrast, academic researchers know the requirements for successful studies, but they often are inexperienced at contracting. Steps can be taken by both sides to simplify administration of joint projects.

- Business can establish policies in support of research. If no precedents can be found, issues such as access to sensitive data and cost-justification of involvement in research can require approvals at the most senior management levels. The delays and complications that result may be enough to frustrate the project coordinators. Gaining advance approval of a policy in support of research activities can simplify the process. Such a policy should state why, when, and how the business will support research on a routine basis. For example, the policy implemented at ASI makes these points:
  - ASI recognizes that support of research is in its best interest because instructional design is a fundamental technology of the business.
  - Proposals will be entertained from any recognized academic entity.
  - Proposals should be in written form, outlining the objectives of the study, the support required from ASI, and the benefits of the study to ASI.
  - Any manager may approve participation in a study requiring access to product or non-sensitive data, or for hours of less than staff time.
  - Other proposals should be coordinated through the Director of Quality Assurance, Standards and Training.
  - An agreement should be executed to maintain non-disclosure of competitively sensitive data and to assure ASI's anonymity in research reports.
  - An agreement should be executed before the study begins specifying ASI's joint authorship, if any, of reports, and governing ASI's use of the results of the study.

- Streamline Academic Contracting Procedures. Many academic institutions have contracting procedures and guidelines intended for governmental research grants rather than private-sector projects. These procedures often include multi-layered negotiation and approval cycles and requirements for burdening of administrative overhead that are unacceptable in a business environment. To contract successfully in a business environment, the decision maker must have considerable latitude to negotiate the contract and must be able to sign quickly once agreement is reached. Businesses generally will negotiate only with someone who has power to sign contracts.

- Once a pattern of successful collaborative efforts has been established, many businesses greatly simplify their contracting procedures. With associates of proven reliability, contracts often are limited to a purchase order or letter of agreement.

Build Long Term Relationships.

Because joint research is so new, only a few business organizations are in a position to issue requests for proposals for large-scale company-funded research projects. A more successful strategy for academic researchers seeking to do research in commercial settings may be to start with small-scale, low- or no-cost proposals. Such proposals might involve student projects and could involve no more costs to the business organization than access to people, products or data. Once projects of this sort have proven their worth, then it may be appropriate to suggest larger scale (and more costly) projects.

For example, interns working for academic credit with little or no salary could undertake projects with research side benefits. Similarly, doctoral students could use data from the private sector in their dissertations. Faculty could spend sabbatical leaves doing research in private sector settings. If experiences such as these are positive, then collaborative research and development projects might be more easily justified.

- Offer to maintain anonymity. Because of competitive considerations, most businesses are reluctant to give non-employees access to details of their operations. Managers may not be familiar with the protections of anonymity offered by standard research ethics. Resistance may be overcome by proposing a written agreement ensuring
Table 2
Checklist for Initiating a Research Relationship

- Locate local training managers by canvassing businesses with gross receipts over $50 million. If training is not centralized, there may be separate managers for management training, and technical training (such as data processing training). They are most commonly located at corporate or division headquarters.
- Prepare an introductory letter explaining your desire to help training managers solve their problems by strengthening research links to academic programs. Emphasize that instructional design is an applied field, more like engineering than physics. Propose that contacts begin with an industry advisory panel or with an interview.
- Follow up with a telephone call to set up the meeting of the panel or to complete the interview. At the meeting or interview, ask questions to determine whether the department's orientation is one of a reactive strategy, cost center strategy, or human capital strategy.
- For each interested contact, propose a small-scale "icebreaker" project with short-term benefits to the company, and with no out-of-pocket costs. Use a two-page, jargon-free summary, with a detailed technical proposal to add detail. Include a proposed agreement on anonymity and nondisclosure. Send the proposal, and schedule a meeting one or two weeks later to present it using overhead transparencies or flipchart illustrations. After the meeting, draft a short letter of agreement outlining the obligations of both parties, and get it signed.
- At the completion of the project, prepare a report with an executive summary that clearly and simply reports what was learned, and as many detailed technical appendices as needed. Offer to present the findings in a follow-up meeting.
- After the initial success, propose a somewhat larger project. Do not involve the university's grant review and approval mechanisms, unless it can be done with no increase in complexity or cost of the negotiation process or the agreement itself.

Conclusion
The presence of instructional designers in the private sector is still a relatively new phenomenon, as is the increasing strategic importance of training within corporations. Thus it is not surprising that business-based research into instructional design is still unusual. However, as businesses become increasingly aware of their investment in training (and their need to invest more), and as there is increasing emphasis on professionalization of the training function, an increasing number of businesses will be willing to invest in advancing the technology of instructional design, just as they invest in other technologies upon which they draw.

Both academic and industrially based instructional developers share responsibility for theoretical development of the field. Recent research in more basic areas such as cognitive psychology, as well as the unique requirements of instructional design in the private sector, have imposed a research agenda that developers must complete if the field is to continue its growth. The alternatives and guidelines outlined here demonstrate how this research agenda can be addressed, even as developers go about the daily business of training design. There are many opportunities; researchers need only take advantage of them.

REFERENCES
The University of Minnesota and Wilson Learning Corporation: An Alliance that Works

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Abstract. The University of Minnesota College of Education and the Wilson Learning Corporation recently joined to create the Alliance for Research and Development in Applied Learning Technology. The goal of this partnership is to foster research in adult learning and technology-assisted instruction. This paper describes the background, structure, and components of this Alliance. Principles that foster success with this type of partnership are described.

Introduction

One chilly day in November of 1982 a half dozen individuals from the Wilson Learning Corporation (headquartered in a suburb of Minneapolis) sat around a conference table at the University of Minnesota listening, asking questions, and taking notes. Throughout the day they interacted with a group of college of education faculty members who stopped by, one at a time, to discuss their research interests, accomplishments, and plans. As it turned out, this day-long meeting was a crucial stimulant in the formulation of a new organization that would come to be called the Alliance for Research and Development in Applied Learning Technology. In this article, we will describe the background of and rationale for the Alliance, present its structure and major components, and finally, discuss several guidelines that seem essential if partnerships such as this one are to succeed.

Rationale and Background of the Alliance

The issues in the world today are too complex for any one organization to address alone. The problem addressed by the Alliance is the learning crisis faced by individuals and organizations due to (a) the rapid generation and equally rapid obsolescence of information and (b) specific demographic factors.

Recently, in a television interview on the CBS program "Sunday Morning" on April 27, 1986, Daniel J. Boorstin, the head librarian of the Library of Congress dramatically illustrated the impact of our information environment by putting it in the context of another age. Essentially he said that a person in the 16th century processed in a lifetime the equivalent of all of the information contained in a single copy of the New York Times!

Less dramatic, but tragically real is the half-life of engineers. Simply stated, two years after leaving engineering school, one-half of their information is obsolete. The rapid influx of the volume and decay of information touches all professions and is rapidly approaching “gridlock” proportions.

Compounding the problem is a population factor that has no historical precedent. According to the last census, the population of the United States is over 200,000,000. If we focus on the population born between the years 1945-1959 (the middle section of the post war baby boom), we come up with a 27-40-year-old age range. This represents over 80,000,000 people, or 40% of the total population.

Added to these startling population statistics is another fact. In a USA Today (Aug. 1986) article, Ronald Kutscher of the Bureau of Labor Statistics, stated that a large segment (those in the 27 to 34-year-old range) will change occupations three to four times within their working lives.

This prediction is not hard to accept when one considers how rapidly growing technologies, changes in the natural resource base, and the influx of new information can change whole economies and industries almost overnight. This escalating growth is reaching crisis proportions, and it is not a crisis of information as much as it is one of learning.

This crisis not only touches the clients of enterprises like Wilson Learning but everyone involved in the learning business, which includes businesses like Wilson as well as more traditional institutions such as universities. In the past the typical solution to such issues was to create a course or curriculum to effectively transmit the new information to the learner. Such solutions are no longer adequate because of the changing nature of information and the number of individuals who need to have access to it. There is a need to shift the focus from the information to the learning process itself. This realization opened up a number of critical questions.

Can we teach people how to learn? How do adults learn? How can we use technology to deal with large numbers of learners in an effective way? How do we identify critical learning or cognitive styles and adapt these to instruction? What is a good definition of competency? What are the components of competency-based curricular? What are some effective ways of tracking competencies? How can cooperative learning increase learner outcomes? How can simulations be used to help learners discover fundamental rules? How can interactive video and computer-based instruction be used more effectively?

It was clear to the management of Wilson Learning Corporation that there are no simple answers to any of these questions, nor would their organization be able to investigate these problems on their own. Many of these questions are issues requiring basic research. This corporation consists largely of application specialists within the training industry,
The problem addressed by the alliance is the learning crisis faced by individuals and organizations as a result of the information revolution.

The initial concept of the Alliance was the brainchild of Larry Wilson, founder of Wilson Learning Corporation and President of its Interactive Technology Group. Wilson has long recognized that the College of Education at the University of Minnesota and Wilson Learning Corporation were involved in similar enterprises but from two different points of view. A primary objective for colleges of education at institutions like the University of Minnesota is to produce basic research on teaching and learning. On the other hand, businesses like Wilson Learning seek to apply what is discovered from research to the problems of adult learners in the settings where they work. It seemed obvious to Wilson that these two organizations had much in common and that together they might begin to move toward addressing the learning crisis in a way that would be more powerful than through independent effort.

The Alliance for Research and Development in Applied Learning Technology began with the signing of an agreement between the two organizations. Wilson Learning Corporation donated $1,000,000 to be delivered in ten installments across 10 years. This document outlined in general terms the nature of the partnership. More specificity was achieved as representatives from the two organizations began to work together on defining the components of the Alliance.

Structure and Components of the Alliance

The major thrust of the Alliance is to foster research in the area of adult learning that is assisted by technology. To help focus this general goal, four major award programs were instituted as well as a number of dissemination activities.

Faculty research awards

The program offers three faculty research awards each year at a maximum of $10,000 each. Consistent with the Alliance’s major goal, the proposed research must involve adult learners and some aspect of technology-assisted learning. Faculty must submit a 5 page proposal describing their research plan, including a section on how this research could address an area of concern in business. Examples of topics of faculty research projects that have been funded include studies of the use of distance learning strategies, effects of various text comprehension approaches, and the use of expert systems.

Dissertation fellowships

Three dissertation awards of $5000 are made every year to doctoral students who have passed their preliminary examinations and have defined their dissertation research problem. Applicants must submit a 5 page proposal describing their proposed study. They must also submit a letter of recommendation from their advisor. Again, these awards are made to individuals whose dissertation topics involve adult learning and technology.

Doctoral fellowships

Two doctoral fellowships are awarded each year to 2 new doctoral students. Recruitment is carried out nationally for top students who wish to study in areas related to technology-assisted learning with adults. Mailings of brochures and the placement of announcements in journals like Educational Researcher, Educational Communications and Technology Journal, and in publications like the Chronicle of Higher Education are ways that this fellowship program has been publicized. Students need not apply to the University of Minnesota prior to applying for the fellowship, but must show evidence that they have been admitted to an appropriate program within the College prior to receiving funds. This award provides an $8000 fellowship during the first year of study, a guaranteed graduate assistantship during the second year of study, and the opportunity to apply for an Alliance dissertation fellowship during the third year of study.

The fellowship program is designed to attract a pool of bright, full-time doctoral students interested in the role of technology in adult learning. As this program grows, a variety of new dimensions will be added, including a seminar in which doctoral fellows will be encouraged to share their research plans. They will be introduced to individuals from the private sector who have a strong interest in improving learning environments. They will begin to build a network of colleagues both inside and outside the University. These students will be given opportunities to work on projects that involve state-of-the-art uses of technology for instruction and will be encouraged to complete internships at Wilson Learning Corporation.

Internal contracts

This program involves the awarding of contracts to University of Minnesota faculty for work on specific projects that Wilson Learning Corporation has initiated. This system works in the following way: Wilson Learning staff identify faculty members who they believe will be able to contribute to one of their development or research projects. The two parties discuss the types of tasks the faculty member would complete and the estimated time commitment. Once an agreement has been reached, the department chair is approached by the faculty member with a proposal. The request may be that Alliance funds be used to buy some release time during the year, be set aside for travel, or be paid to the faculty member during the summer. Once the department chair and faculty member reach an agreement, the proposal is sent to the Dean’s office for approval. The final step is approval by the Alliance Review Committee. Once all levels of approval have been gained, monies for the faculty member are moved from the University Foundation to
the department for disbursal as agreed upon.

This program is very appealing to faculty for many reasons. First, it gives them an opportunity to work on interesting projects that utilize their expertise. In turn, these projects enrich the professor's expertise and may result in additional writing and publications. Second, such contracts establish valuable relationships that may lead to consulting opportunities at a later date. Third, because it is an internal contract rather than outside consulting, this type of arrangement "counts" as evidence of obtaining research and development monies. Thus it is recognized as valuable within the University's reward system. Fourth, the contract provides some prerequisites to the faculty member, such as summer money, a research assistant, release time, or travel money.

**Dissemination activities**

A primary vehicle for the dissemination of research findings from projects sponsored by the Alliance is an annual symposium held at Wilson Learning Corporation headquarters. Recipients of the student and faculty research awards each team up with a staff member from Wilson to prepare and present a summary of the background and design of the research, the findings, and possible implications for business problems and products. Members of the audience include Wilson personnel, University faculty, and graduate students. In the future, clients of Wilson Learning also will be invited to attend.

**Guidelines to Promote Successful Partnerships**

Programs such as the one described here that involve partners from organizations with different organizational structures and goals can be enormously beneficial for both parties. In this section principles are described that we believe will strengthen the success of these partnerships and reduce problems.

1. **Be prepared to accommodate differences in the cultures of the two organizations.** For example, we have learned that the different cultures that exist within our two organizations may lead to different expectations in the speed and style of decision-making. Decisions within business often can be made from the top down and quickly. At universities, bottom-up decisions are valued, oftentimes with painstakingly slow processes that include committees and task forces, and other faculty dominated structures. Important decisions are rarely made quickly. Business can make such decisions more quickly because the consultative process is often much more limited.

   Another cultural difference has to do with expectations about work styles. Faculty at research universities value their autonomy and protect it. They decide what they will teach and when. They choose the topics or problems they wish to study. They select the doctoral students they wish to advise. They decide when they will come to the office, meet with students, take trips, apply for sabbaticals, and so on. The business climate fosters team-oriented activities and one's success may well depend on that of one's team members. Cooperative efforts are the norm rather than the exception.

   These differences broaden the perspectives of individuals on both sides of the partnership. Faculty experience the inevitable pressures that build when a product must be delivered to a client within a tight deadline set by an outsider. Business people begin to appreciate the time consuming nature of conducting research.

2. **Individual within each partnership organization must assume responsibility for coordinating the partnership within their respective settings.** These persons will communicate program components, policies, and events to other members of their organizations. The multitude of logistical tasks inherent to such arrangements must be managed competently. Close communication between the two individuals will alleviate many troubleshoots.

3. **Maintain the integrity of the program by initiating and following policies that are made public.** As programs of this nature evolve, many ground rules must be established by the governing board composed of members from the participating institutions. We have found it important to establish written policies to guide proposal development and review. Once these policies and ground rules are established, it is important that they be followed closely so as to minimize misunderstandings.

4. **Each participating partner must share in the expenses associated with the administration of the program.** There are many "hidden" costs that accompany the type of program described here. Promotional materials must be created and distributed, long distance telephone calls made, awards banquets held and travel costs incurred. Staff time from individuals within each organization is needed. We believe that each organization demonstrates its commitment to the partnership by bearing some of these costs.

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Internships in Educational Technology Academic Programs: A Status Report

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Abstract. The chairpersons of doctoral level educational technology programs were surveyed to determine the current status of internships in their programs. Ninety percent of the chairs responded. The questionnaire gathered the following information regarding internship practices: requirements, placement, participation, characteristics and evaluation. The findings are reported in these categories.

Introduction
The educational technology field, unlike counseling and some health areas, currently does not require an internship experience as a prerequisite for practice. However, an increasing number of educational technology students (and members of the academic and business communities) are seeking the benefits of an internship experience (Sink & Sari, 1984).

The literature related to internship training in the educational technology field is limited. While several authors discuss the benefits of internship experiences (Baas & Duncan, 1981-82; Deden-Parker, 1981; Rossott, 1981; Sink & Sari, 1984), no information is available that reports current academic requirements and practices.

This article presents the results of a survey of internship activities in educational technology academic programs in the United States.

Procedures
A questionnaire was used to gather information regarding internship practices in the following areas: requirements, placement, participation, characteristics and evaluation. The instrument was developed by the authors. It was pilot-tested with faculty at their own institution and with three chairpersons of educational technology programs located elsewhere.

During this process, it became apparent that a variety of terms (e.g., field experience, guided practice, internship, practicum, and apprenticeship) are used by academicians to describe the activities that offer students practical experience outside the classroom as part of their academic training. The authors sought the advice of several educational technology chairpersons to determine the most appropriate terms to use in the study. An internship was defined on the questionnaire as follows: A situation in which the student functions as a professional in an educational technology position (e.g., designer, developer, producer, evaluator) for the purpose of gaining practical field experience.

In the fall of 1985, the survey was mailed to the chairpersons of the 58 doctoral level educational technology programs listed in the 1984 edition of the Educational Media Yearbook. Forty-four responded immediately. During the follow-up phase, it was discovered that four institutions no longer offered doctoral programs in educational technology and three programs could not be reached. As a result, the sample size fell from 58 to 51 programs. Following phone calls and a second questionnaire, 46 of the 51 institutions responded, resulting in a 90% return rate.

Program Description
Student enrollment at twenty-seven (56%) of the programs was 50 or fewer majors (masters and doctoral in the fall of 1985). Ten programs (22%) enrolled 50 to 100 students, and 9 (20%) reported enrollments of over 125 educational technology majors. The majority of respondents (65%) indicated that less than half of their majors were full-time students. Nearly all (92%) expected their enrollments to remain constant or increase in the next academic year.

The population of the communities in which the programs are located ranges from under 10,000 to over one million, with 100,000 representing the median. There was no correlation between size of enrollment and size of community.

Program Requirements
As shown in Table 1, sixty-three percent of the masters and sixty-five percent of the doctoral programs did not require internship experiences, but all master's level (100%) and nearly all doctoral level programs (89%) encouraged their students to participate. A few programs at both the masters and doctoral levels are considering making the internship a requirement.

Of the programs that do require an internship experience, three-fourths said that the requirement could be waived if the student provides evidence of "prior relevant experience." This is true at both masters and doctoral levels. The questionnaire did not request the criteria for waiver.

Intern Placement
All of the respondents reported that faculty members help place students in internship positions. Over two-thirds also said that students seek their own positions much like a job search.

Ease in placing students in internships was measured by a 5-point scale (very easy through very difficult) and obtained a mean response of 2.0. Twenty-three percent indicated that it was very easy to
place interns, but 5% found it difficult. Eighty percent reported having cooperative relationships with the sponsoring organizations. The types of sponsoring organizations frequently mentioned by the respondents were training departments within large organizations, independent training companies, healthcare facilities, public schools, and their own academic institutions.

Student Participation

Students in forty-two (93%) of the programs participated in internships during the fall of 1985. The number of interns per program was anywhere from 1 to 25 or more; most (76%) programs reported from 1 to 10 interns.

Forty-two (94%) respondents indicated that the current number of interns was the same as, or more than the number during the previous fall. Three programs noted the number was smaller, and one reported that no students had participated in an internship during the past two years.

Internship Characteristics

The most frequently reported durations of internships were 5 to 10 weeks and 11 to 15 weeks. Some lasted longer, including up to a year. The amount of time an intern spent with the sponsoring organization ranged from less than 8 hours to more than 40 hours per week. The most frequently reported time commitment was 9 to 20 hours per week.

There was no clear pattern of compensation for the interns. The range included no compensation, reimbursement for meals and travel only, wages less than a new employee, and wages comparable to a new hire. Over half of the respondents checked more than one of the above categories, and several stated the amount of pay depended on the sponsoring organization.

With regard to location, the interns were most often placed in organizations within commuting distance of the institution (86%). The locations cited next were their own academic institution (66%), and organizations located beyond commuting distance of the institution (50%). Again, respondents often checked more than one category.

Students completed their internships in a variety of settings. The most frequently mentioned were business and industry (89%) and higher education (80%), followed by elementary and secondary schools (67%), healthcare facilities (51%), and government settings (36%). Four programs listed community and cultural organizations as internship sites.

Evaluation

Thirty-nine (87%) of the programs reported that their interns were evaluated during the internship experience. They were judged on projects they produced (73%), meetings with the faculty or other persons (60%), and attendance at special classes or seminars (22%).

With one exception, all the programs evaluated the interns at the end of the internship. A variety of methods were used. These included the advisor’s judgment of products created by the intern (76%), observations by the faculty members during on-site visits (73%), written evaluations by supervisors in the sponsoring organizations (51%), and student self-evaluations (43%).

Nearly all the academic programs (98%) offered credit for satisfactory completion of the internship. The amount of credit ranged from 1 to 15 units.

Discussions

The results of this study provide baseline data on the status of internships at a specific period in the evolution of educational technology programs. The high response rate (90%) to the lengthy questionnaire by busy program chairpersons is evidence of the importance and timeliness of the topic. The extensive, unsolicited comments offered by the respondents on the survey and during phone conversations reinforce this observation. It must be recalled that the study was limited to institutions offering programs at both the masters and doctoral levels.

Taken as a whole, the programs appear ambivalent in their commitment to the concept of internships as academic experiences. While only about one-third of the programs require students to participate, all encourage their students in

An internship was defined as a situation in which the student functions as a professional in an educational technology position for the purpose of gaining practical field experience.
this direction. On the other hand, three-fourths of the programs that require an internship will waive the requirement if the student can show evidence of acceptable prior experience. Finally, despite the uncertainty of the academicians, the facts are that students from 94% of the programs participated in internship positions during the time period investigated and the number of interns was equal to or greater than in the previous year.

Intern compensation and internship duration are two other unsettled areas. Of the various types of organizations that sponsor internships, the only common denominator is their commitment to training or education. Finally, effective and yet practical methodologies for evaluating the internship experience as well as the individual intern's performance are not yet in place.

The rapid development of student internships in the private and public sectors is unprecedented in the history of the educational technology field. Both the academic programs and the sponsoring organizations are cautiously feeling their way in this new venture. As both gain further experience, it is probable that the nature of the internship will also change.

The rapid development of student internships in the private and public sectors is unprecedented in the history of the educational technology field.

REFERENCES
It takes chutzpah to name a book The Theoretical and Conceptual Bases of Instructional Design. You are promising that your effort will be theoretical. Richey says that that means there is a "formal statement of propositions which describe the relationships between the various theoretical constructs" (p. 13). With a title like that you are also raising expectations of a treatment that will be conceptual; Richey says that such a model provides a "general, verbal description of a view of reality" where components are "more likely to be supported by experience, as well as limited data" (p. 17). And brazenly, you are pairing the literature on theory, concept and model building with the unabashedly pragmatic field of instructional design.

Rita Richey's book provides a different and needed perspective on our field. While so many of us are consumed with developing instruction to enhance automation, or using computers to facilitate problem-solving skills, or researching which feedback is most reinforcing to adults, Richey successfully makes broader and more profound statements about our field. As she says in the first page of her book, she will focus not on "how to," but rather on "what" and "why." Let's examine some of her contributions.

She provides an excellent review of the foundations of instructional design. She cites general systems theory, learning theories, communication theories and conceptual models of instruction and is specific about their contributions to instructional design. Here is an example:

Learning theory is critical to the formulation of specific design rules. While systems theory gives direction to the large-scale management of design, learning theory provides direction to the detailed moves which are built into individual lessons or pieces of instructional materials... While a major influence to date has been from the behaviorists, the climate has now switched to consideration of the principles of cognitive psychology (p. 22).

Richey effectively updates Saettler's 1968 work and incorporates literature from business, teacher education, military training, telecommunications, cybernetics and vocational education. I found myself mulling over her discussion of Dale's Cone of Experience, pondering ideas that I had not thought about in a decade. I often turned to the ends of her chapters to check out references that were new to me. Do you know Monge's work? Marsh's? Haertel, Walberg and Weinstein's? What about Marx? (I admit it. I thought she was talking about Karl Marx until I noted the date on the reference.) Richey effectively stimulates thought and encourages the very faculties towards which she directs the book.

She provides a useful and tangible way of looking at the familiar. I usually liked the way Richey chose to conceptualize her subject matter. For example, she reviews the literature on successful contributing variables for instructional designs through four clusters: the learner, the content, the environment and the delivery. She also presents an interesting review of models which are described in light of the way they handle decisions about time, tasks and learner control. Another example is the distinctions she draws between three kinds of pre-requisites: content, basic learning skills, and information processing abilities. Richey's treatment of the behavioral and cognitive underpinning of our field is on-target. Generally, her analysis of her subject matter is useful or interesting to the reader.

She effectively straddles the worlds of business, public schools, higher education, health and the military. When she uses examples, she attempts to include the many settings that are touched by instructional design.

She presses us to move towards theory development. Without exhortation or cajoling, Richey encourages a seriousness about theory building which bears repeating in our literature. In a field where Andrews and Goodson's 1980 review of instructional design models found more chaos than congruence or clarity, Richey believes we can do better. She urges us to transcend individual development projects and isolated research and use mathematical and meta-analytical strategies to derive more dependable, generalizable and robust theories.

Richey's book is not perfect. For one thing, her fascination with concepts may have created an unwarranted passion for grids. She crosses everything with everything, placing X's in boxes for reasons that I could not always discern.

The book would also profit from more examples as it would from an expanded treatment of contributors like Bruner. I do not mind that the book gives short but respectful shrift to Charlie Reigeluth since his ideas are available to us elsewhere. It is the others, from neighboring disciplines and settings, whose intriguing ideas we miss.

Richey does not make value judgments. She does not agree or disagree. You do not really know how she would design a course or whether she prefers Merrill to Gagne. Such neutrality drains life from the book. The brains behind the book are obvious; the heart is less so.

Another concern is one that has as much to do with us as it does with Dr.
ERIC Reports on ID

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Planning the activities for an instructional development unit and evaluating how well it has performed requires a set of standards against which the unit can be compared. This paper proposes a set of standards developed from a variety of references and personal experiences with instructional development units from across the country. Thirty-eight characteristics of a model instructional development unit are presented in five categories: plans and goals, organization and administration, decision making, activities, and evaluation. Eighteen references are listed.—Microfiche 75 cents, paper copy $3.60 plus shipping, as document ED 265 844.


The purpose of this paper is twofold: (a) to outline the issues involved in designing videodisc-based instruction to meet the needs of the public high school, and (b) to describe the approach being used in one project that is developing videodisc-based courseware for high school math and science instruction. The first of two major sections presents a rationale for interactive videodisc instruction, a description of a four-level classification scheme for instructional videodisc configurations, and a discussion of the educational implications of the different levels. It is pointed out that videodisc-based courseware can be designed to work effectively in both Level 1 and Level 3 delivery systems; this dual approach to courseware development appears particularly suitable for use in public school math and science instruction. The second section summarizes the development of a series of interactive videodiscs (e.g., "Core Concepts in Math and Science") including the instructional format, development and validation procedures, and observations from the field test. It is concluded that the combination of interactive videodisc technology, selected instructional design, and mastery learning procedures provided the teacher with a flexible and powerful resource. A list of references is appended.—Microfiche 75 cents, paper copy $3.60 plus shipping, as document ED 267 729.


To examine the role of elaborations in learning a procedural skill from an instructional text (in this case, using a personal computer), 88 members of the Carnegie-Mellon University community (students, faculty, and staff members) participated in two experiments. Experimental sessions consisted of a reading period followed by a task performance period in which subjects utilized an IBM personal computer. The first experiment compared two sources of elaborations: those provided in an elaborated version of the microcomputer user's manual, and those generated by learners while reading an unelaborated manual. For the second condition, subjects were given advance information about the tasks they were to perform so that they would generate more specific task-related elaborations while reading. It was concluded that both sources of elaborations facilitated skill performance, in contrast to past ex-
periments testing declarative knowledge in which author-provided elaborations were found to hurt performance. The second experiment examined responses to author-provided elaborations which were classified into two groups: those illustrating the syntax of the operation system commands, and those explaining basic concepts and their applicability. Findings indicate that although syntax elaborations produced significant facilitation for both experienced and novice computer users, concept elaborations produced no reliable improvement. Appendices contain samples of elaborations used in the two experiments, a five-page list of references, notes, and five data tables.—Microfiche 75 cents, paper copy $5.40 plus shipping, as document ED 265 824.


High and low level questions as determined by a panel of evaluators were combined with corrective feedback, and attribute isolation feedback to form four versions of a computer-based science lesson. The sample consisted of 154 high school chemistry students in a suburban high school. The primary hypothesis was that students who received high level questions and attribute isolation feedback would perform significantly higher on posttests than students who received the other combinations of questioning and feedback. The experiment used the three-factor, repeated measures design known as the two-between-one within-subjects design defined by between-subjects variables A (levels of questioning) and B (feedback conditions), which cross, and by the within-subject factor C (scores on Posttest I and Posttest II) treated as a repeated measures factor. Results indicate the primary hypothesis was not sustained, but the question-level by posttest interaction and the question-level and posttest main effects were statistically significant at the .05, .001, and .01 levels respectively. The question-level main effect and the question-level by posttest interaction provided verification of the efficacy of levels-of-questions as an instructional factor in courseware design. High level questions were more likely to cause deep cognitive processing and to enhance retention than low level questions, and should be included appropriately in the design of computer-based instructional systems. A four-page list of references is provided.—Microfiche 75 cents, paper copy $3.60 plus shipping, as document ED 266 766.


The purpose of this study was to examine how learners with different levels of prior understanding of a topic interact and learn from computer-assisted video instruction systems when they have control of content, sequence, pace, and mode of instruction. Based on pretest scores, 80 subject were randomly selected, half with low prior conceptual understanding, and half with high prior conceptual understanding. Half of the subjects from each group were randomly assigned to a program vs. learner control condition which consisted of computer-assisted video instruction modules on protein synthesis. A 2 X 2 analysis of variance was conducted on posttest scores and time on task, followed by a regression analysis to assess the relationship of other independent variables with posttest scores and time on task. In the learner control condition, subjects with high prior conceptual understanding in the subject area made significantly better use of control options and their time than the subjects with low prior conceptual understanding. In the program control condition, there were no significant posttest score differences, but there were significant time on task differences between subject groups. This study evaluated students had significantly higher posttest scores in the program control condition than in the learner control condition; however, there were no significant differences in time on tasks between conditions. High prior conceptual understanding subjects performed equally well in both program control and learner control conditions. A three-page list of references and several tables and figures complete the document.—Microfiche 75 cents, paper copy $3.60 plus shipping, as document ED 265 845.


The purpose of this study was to examine the effects of behavioral and
cognitive organizing strategies and varied processing intervals on factual and inferential learning. A total of 49 upper-division undergraduate and graduate students, who were randomly assigned to either a cognitive, behavioral, or individual orienting strategy group, received computer-assisted instruction (CAI) with either 10 or 30 seconds of access time to branch to lesson segments. Presented at identical locations throughout the lesson, orienting strategies addressed criterion information either explicitly or in more general abstract terms. Upon completion of the lesson, students were administered a posttest measuring both factual and inferential learning. Results indicate that the explicitness of the orienting strategy did not affect the learning of either facts or inferences differentially, however, a marginal effect was found for access time, with students performing better with 30 seconds. The results suggest that differences in orienting strategies may not be as important as sufficient time for strategy utilization. A list of references, two data tables, and two figures are included.—Microfiche 75 cents, paper copy $1.80 plus shipping, as document ED 267 773.

The above documents may be ordered from the ERIC Document Reproduction Service (EDRS), 3900 Wheeler Ave., Alexandria, VA 22304-5110. Please order by ED number, indicate the format desired (microfiche or paper copy), and include payment for the price listed plus shipping. For information on shipping charges, call EDRS at 1-800-227-3742. Inquiries about ERIC may be addressed to the ERIC Clearinghouse on Information Resources, 930 Huntington Hall, Syracuse University, Syracuse, NY 13244-2340 (315-443-3640).

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