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ABSTRACT

A review of current research on workplace literacy programs reveals few programs reporting rigorous evaluations. Assessments are often limited to the completion of questionnaires, surveys of program participants, and anecdotal reports of effectiveness. Occasionally, a standardized reading test provides an indication of learner gains. Only a few evaluations provide follow-up data on the impact of programs on job performance, retention, or earning power. Trends among programs for which more rigorous evaluations have been performed are as follows: (1) effective programs require significant resources in terms of learner time on task; (2) effective private programs report learner cost figures more than double those of average public programs; and (3) effective programs integrate basic skills training with workplace technical training and usually involve counseling, on-the-job training linkage, and analysis of the basic skills needed on learner jobs. The eight-volume Job Training Partnership Act evaluation plan is the most thorough guideline for evaluating the effectiveness of preemployment literacy programs. Stufflebeam's Context, Input, Process, Product evaluation model has been modified by outside consultants for use with workplace literacy programs. This model uses interviews, document analysis, observations, and test data to determine program goals, sufficiency of resources, sufficiency of learning methods, and evidence of goal attainment. (14 references) (YLB)

How Effective Are

Workplace Literacy Programs?

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Abstract

A review of current research on workplace literacy programs reveals few programs reporting rigorous evaluations. Assessments are often limited to the completion of questionnaires, surveys of program participants, and anecdotal reports of effectiveness. Occasionally a standardized reading test provides an indication of learner gains.

Only a few evaluations provide follow-up data on the impact of programs on learner job performance, retention, or earning power. Among programs for which more rigorous evaluations have been performed, a few trends are apparent.

1) Effective programs require significant resources in terms of learner time on task (i.e. 50-100 hours of instruction per average 1 year of learner gain).

2) Effective private programs report learner cost figures more than double those of average public programs (i.e $7000 vs $2800).

3) Effective programs integrate basic skills training with workplace technical training. This usually involves counseling as well as on-the-job training linkage and analysis of the basic skills needed on learner jobs.

Early Evidence for Effective Programs

During the 1970's, the U.S.military Functional Literacy (FLIT) Project collected the most extensive workplace literacy program evaluation data yet available. The 120 hour, six week program evaluated data for over 700 enlisted men. Results indicated that students in the FLIT program demonstrated three times the improvement in job-related reading as in general reading and performed job-related reading three times better than comparable students in other Army and Air Force programs. This indicates that general reading training does not transfer well to job reading performance and the targeted job-literacy training is more effective than general training. Further, retention studies indicated that ater 8 weeks FLIT personnel retained 80% of their end-of-course gain in job-related reading, but only 40% of their end-of-course gain in general reading General reading gains for the 120 hour program averaged .7 grade level while job reading gains averaged 2.1 grade levels (Sticht, 1982, pp. 24-27).

During the early 1980's, a few civilian programs attempted to integrate workplace instruction with on-going technical training. Mikulecky and Strange (1986) report on a program to train word processor operators and a second program to train wastewater treatment workers. Each program involved extensive training time (several hundred hours) and involved

some form of screening for admission. The word processor operators attended paid training 40 hours per week for from 14-20 weeks (until they were able to function at levels comparable to average employed word processor operators). The wastewater treatment training program involved 20 full weeks of voluntary training which alternated classroom training with on-the-job training and provided approximately 100 hours of supplementary literacy support for the least academically able of its workers.

The word processor training program experienced a drop-out rate below 10 percent. The average learner reached job-level competence in an average of 20 weeks or 800 hours (the earliest trainees found employment in 14 weeks with a few taking nearly 28 weeks). The 1981-82 program concluded in the middle of a major recession in which 1/3 of cooperating companies stopped all hiring. In spite of these economic difficulties, 70 percent of program participants found employment as word processor operators by October of 1982. The wastewater treatment workplace literacy program focussed on the least literate 20 percent of workers. Nearly 1/2 passed their technical training post tests. The consensus of technical instructors was that less than 5 percent would have passed without additional support. Of students attending special training sessions, nearly 70 percent were able to accurately summarize job materials in their own words by the end of

training. Only about 10 percent of learners demonstrated gains in general reading abilities and these were students who invested 5 or more hours weekly outside of class on general reading materials. Retention of students receiving special basic skills training was higher than that of more able students who attended technical training only.

Current Workplace Literacy Program Evaluations

Research and evaluation data on the effectiveness of current workplace literacy programs are a bit uneven. A few programs (Haigler, 1990; Philippi, 1989, Hargroves, 1989, Auspos, et al, 1989) have systematically collected evidence of effectiveness. Many other program reports are limited to sketchy descriptions of program components, anecdotal recountings as indications of effectiveness, and incomplete references to learner performance results.

JSEP: Among recent workplace literacy programs which report evaluation data are two programs which transfer the U. S. Army's Job Skills Education Program (JSEP) to civilian settings. JSEP consists of 315 workplace basic skills lessons, the majority of which are computer based and which contain approximately 300 hours of instruction. The individualized, competency oriented, self-paced lessons are intended for adults functioning between fifth and eighth grade reading levels. Students using the JSEP system are identified by their job specialty and their

instructional needs are keyed to the basic skills associated with their particular jobs.

Haigler (1990) describes a civilian modification of the military materials which was tested in an adult basic education setting in White Plains, New York and Philippi (1989) reports the evaluation results of a similar modification by a Mississippi business/community college partnership. In the White Plains program, 61 adults (31 ABE students, 20 ESL students, and 10 GED students) spent an average of 78.8 hours on line with the computer modules to complete an average of 40.5 lessons. Pre and post test results on the Test of Adult Basic Education (TABE) indicated an average gain of 1.26 grade level in reading and .94 in math. Students also averaged 37% gain on a 65 item test developed from learning materials. Gains ranged from 22% for GED students to 54% for ESL students (Haigler, 1990).

Philippi (1989) reports on a JSEP adaptation in Mississippi involving the National Alliance of Business, Meridian Community College, and current employees of Peavy Electronics. The employer was interested in whether participation in the basic skills program would enable employees to better perform on the job, better prepare workers to deal with the introduction of new technology, and better prepare them for promotion. A pilot group of 63 employees, screened to be between grades 5 and 8 in reading ability, used JSEP lessons prescribed to match skill demands of

their jobs. Literacy task analyses were used to determine job skills demands. For twelve weeks, employees twice weekly attended 1 hour and 40 minute classes. Ninety-five percent of employees missed one or fewer classes. The remaining students missed a maximum of three classes. Learners averaged 39.47 hours of instruction with a range of 35 hours to 40 hours.

Though no control group was available for comparison, post-program interviews with supervisors indicated varying degrees of program effectiveness. Supervisors noted job performance improvement in 33% of participants. Over 20% of participants had inquired about openings in jobs requiring higher skills and/or computer operation. Supervisors indicated they would recommend 57% of JSEP participants for pay increases and 60% for promotions. In terms of impact on operations, supervisors noted increased productivity and quality in the work of participants. This increase was attributed to improved ability to read gages, schematics, do calculations, and work in teams. Nearly half of supervisors felt their jobs had become easier as a result of the JSEP program (Philippi, 1989, 58-59).

One area of concern for future users of the JSEP system was hardware reliability. Phillipi notes that "the instructor's log and the learner comments about JSEP management and hardware systems indicate less than satisfactory interface with the system (Philippi, 1989, p 64)." Documented complaints highlighted frustrating equipment failure,

difficulties with the use of the light pen technology, as well as complexities and inaccuracies with computerized record-keeping system. Accessible technical support would seem to be key for future JSEP use.

Federal Reserve Bank's Skills Development Center: Hargroves (1989) reports on a particularly extensive long-term study of the impact of a workplace basic skills program upon job performanc , earnings, and retention. She presents the results of a 15 year comparison of Federal Reserve Bank basic skills trainees to a peer group of entry level workers in terms of: 1) effectiveness of training in helping undereducated youth catch up, 2) retention, 3) job performance and 4) earning power. Hargroves describes the Boston Federal Reserve Bank's Skills development program which integrates basic skills and clerical training, supervised work experience, and counseling. Trainees come into the program because they lack basic skills needed in most clerical jobs. Though 50% of trainees have graduated from high school, half read at the eighth grade level or below. Two out of three Skills trainees attend long enough to complete an extensive class and on-the-job training program leading to job placement.

Hargroves (1989) gathered information on 207 Skills Center trainees from 1973 to 1988 and compared employment data to that of 301 Bank employees hired for entry-level positions from 1974 to 1986. Results indicate that several months of formal training combined with on-the-job experience and counseling can enable undereducated youth to catch up to

typical entry-level workers. Two thirds of trainees (who would not otherwise have been eligible for employment) were placed in jobs. The trainees, on the average, stayed longer than their entry-level peers, despite a low unemployment rate and ample job opportunities outside the bank in the late 1980's. The majority of Skills Center graduates earned as much as their entry-level peers who were more educated and experienced. "In summary, the program produced a supply of employees who were trained as well or better than other new entry-level employees and understood the Bank's employment practices; it also provided trainees to departments on short notice for extra clerical help (Hargroves, 1989, p. 67)."

Several elements key to program success are highlighted. These include: 1) integrating basic skills, clerical skills, work experience and intensive counseling, 2) self-paced and often one-on-one instruction focussing on competence, 3) connections to community agencies for recruitment, and 4) good communications with Bank supervisors in order to develop job placements. The program cost was just over $7,000 per enrollee in 1987 which contrasts to an average of $2,800 per person in publicly funded adult training programs (Hargroves, 1989, p. 67). Given the high turnover rate in many bank positions, the more expensive private program with a proven track record has been judged to be cost-effective.

Vestibule and Pre-work Basic Skills Programs: Another thorough recent evaluation of a pre-work literacy program is the evaluation of

JOBSTART in 13 diverse sites across the country (Auspos, P. and Others, 1989). JOBSTART is a demonstration program designed to address the employability problems of school dropouts. Funding comes from more than a dozen sources, but the program is offered primarily under the federal Job Training Partnership Act (JTPA). The program offers basic education, occupational skills training, support services, and job placement assistance for economically disadvantaged dropouts who read below the eighth-grade level.

In the first year, 2,312 applicants were randomly assigned to either an experimental group receiving JOBSTART training or to a control group not offered JOBSTART, but receiving other available community services. 1,401 of the original applicants were available for a 12-month follow-up survey. Participants averaged 132 hours of basic education.

Comparison of JOBSTART participants to other JTPA participants revealed that they were more disadvantaged and received more training (6 months vs. 3.4 months) than is typical for JTPA participants. Approximately 30 percent of participants reported receiving a GED within twelve months of entering the program (43 percent for those starting above a seventh grade reading level and 20 percent for those beginning below that level). Only 1/3 of the participants were tested for reading gains. The Test of Adult Basic Education was used to measure gains. These participants averaged .7 of a year gain in reading ability (average grade 6.9

to 7.6) after approximately 100 hours of instruction.

Compared to the control group, JOBSTART participants were substantially more likely to receive GEDs or high school equivalency certificates. Job placement for JOBSTART participants was the least effective component of the program. In the short term, JOBSTART participants averaged lower earnings than control group members. The evaluation also discusses constraints placed upon the program by JTPA performance standards. Chief among these is that increasingly vendors are paid only if enrollees reach benchmarks in achievement including placement in a training-related job. This creates an incentive for less training and more rapid placement. Similarly, no funds are available for vendors to recruit and keep records on control group participants. These practices have been identified as likely to discourage vendors from working with populations who tend to need longer and more expensive training and from evaluating program effectiveness in any rigorous fashion.

Hirschoff (1988) describes another vestibule literacy project designed to help low-income women become blue-collar workers. **Non-Traditional Employment for Women (NEW)** was established in 1978 as more than a basic skills preparatory employment program for low-income women. The program includes job placement services and introducing women to non-traditional career opportunities. In 1984, NEW began providing a literacy program for women with reading scores below an eighth grade

level. NEW applicants were steered to the literacy program if their reading and math scores preclude reasonable hope for acceptance into a skills training or decent jobs.

NEW's literacy program served fifty-six students during the 1987 fiscal year. The only evaluative process appears to be pre and post-testing of the students reading abilities using the Test of Adult Basic Education (TABE). Sixty-two point five percent of the students in the 1987 program "who took post-tests improved their scores by two to three grade levels, while twelve point five percent gained three levels or more. All but six gained at least one grade level" while approximately twenty-two students improved enough "to enter NEW's skills training program. Twelve entered pre-apprenticeship classes and are now earning $10 to $18 an hour in blue-collar positions. Eleven women took NEW's building maintenance course and went on to related jobs. Two entered GED programs and received their certificates"(Hirschoff 1988, p.10). No information was provided on the average learning times needed to obtain the reported gains. The program claims it maintains no set curriculum nor fixed time frame, partly because applicants enter the classes at any time throughout the year and partly because their needs and backgrounds vary so much.

Though data on vestibule literacy program effectiveness is limited, the JTPA Evaluation Design Project is in the process of developing an extensive guide for JTPA program evaluation. The evaluation guide is an

eight volume series of "evaluation tools that are useful to states and local service delivery areas in judging how JTPA programs are being managed and how they are impacting program participants and employers" (Washington State Dept. of Employment Security 1986, p.1). The eight volumes are the following:

Volume 1: Overview
Volume 2: A General Planning Guide (State and local version)
Volume 3: A Guide for Process Evaluations
Volume 4: A Guide for Gross Impact Evaluations
Volume 5: A Guide for Net Impact Evaluations
Volume 6: An Implementation Manual for Net Impact Evaluations
Volume 7: Issues related to Net Impact Evaluation
A.Issues in Evaluation Costs and Benefits
B. The Debate Over Experimental vs. Quasi-experimental Design
Volume 8: MIS Issues in Evaluating JTPA

Later volumes are not yet available and the evaluation guide does not address the constraints identified by the JOBSTART evaluation.

Washington's Department for Employment Security (1986) reports that the volumes "respond to the differing needs of both state and local users ... designed to offer JTPA users a fairly selective yet diversified menu of technical assistance products to meet a variety of evaluation needs and interests. Taken together, these products support comprehensive evaluations over the JTPA planning cycle"(p.2).

Current Program Descriptions without Extensive Evaluation Data: The research data bases include several descriptions of workplace literacy

programs developed as cooperative ventures between businesses, unions, communities, and educational providers. Though few thorough evaluations are mentioned, some indications of program evaluation are discussed.

Rosenfeld (1987) describes four innovative and effective adult literacy programs in four employer-based sites: a university in North Carolina, a naval base in Tennessee, a large company in Virginia, and a coordinated community program in Alabama.

The goal of the **Physical Plant Adult Basic Education Program** at North Carolina State University was to provide basic skills and GED education to university service employees. The program offers two different levels of basic education and a GED test preparation course. Instructors use student stories, literature, poetry, songs, cultural experiences, and history relevant to the interests of the students because of the program's belief that workplace literacy programs do not have to teach only job-related skills through job-related materials. Gains in reading levels for the participants have ranged from 1.5 to 2.0 grade levels. However, no mention is made as to how these gains were measured. The program lasts eleven months, and participants spend four hours of work-release time a week in classes. Rosenfeld (1987) admits that economic outcomes are difficult to document and that "[i]ndirect benefits to the university, according to the director, are more qualified employees who are less prone to be absent and to feel frustrated by lack of qualifications and opportunities"(p.8). Again, no

evidence for these indirect benefits is provided. There is some question of the transferability of reading poetry to that of reading a memo from a supervisor. No data related to this question were provided. Rosenfeld (1987) concludes that the goals of the program were "more altruistic than economic. It is a case more of community service than plant efficiency"(p.8).

The U.S. Navy and the city of Memphis, TN developed a joint workplace literacy project in 1986 entitled **Project Literacy** . The navy had been conducting a short-term total immersion program called Academic Remedial Reading (ARR) for its recruits. No details about this program's effectiveness are provided. As part of the cooperative effort, the Navy's program was modified to fit the needs of the sixteen Memphis Sanitation and Parks Department employees who participated in the ten full workdays program. At the end of the ten days, it was noted that all sixteen learners made "increases in the reading levels ranging from 0.5 years to 6.0 years. The average improvement was 3.6 grade levels" (Rosenfeld 1987, p.6). These gains were measured by comparing learner pre and post-program test scores on an unnamed test. Other reported gains were improved self-esteem among the participants, a desire to continue improving their learning, and an "esprit de corps" which led to peer support and tutoring. The basis for these gains was not mentioned. Program reports indicate a need for testing hearing and eyesight, flexibility

in modifying lessons accordir.g to student needs, and having course materials "be relevant to adult learners"(Rosenfeld, 1987, p5).

The Newport News Shipbuilding and Drydock Company in Virginia and the local school system joined together in 1985 to improve the opportunities for the company's older employees and to perform a service to the community. The partners received a grant from the state to design a joint literacy program entitled **The Reading Program**. Curriculum included both work-related and personal living experience materials. "Participants learned about money management and health care as well as shipyard safety and work-related communications" (Rosenfeld, 1987, p.9). Based upon anecdotal reports, Virginia had given increased financial support to the second year of the program before a more formal evaluation report was completed. As of the writing of Rosenfeld's article, a formal evaluation was being done, but the results were not yet available. Therefore, no comment on evaluation practices was made.

The Albertville City School System, four local large employers (Keyes Fiber, Arrow Shirt Company, Kendall Company, and the City of Albertsville), and the Northeast Alabama Area Adult Basic Education Program established the **Albertville Business/Industry Educational Program** in 1985. The program was designed for workers in area industries who were unlikely to be reached through regular Adult Basic Education programs . Each of the four participating employers worked with the

school system to provide their own job related materials at each of the worksite classrooms. Support by both plant managers and local politicians is reported. No information about program effectiveness or evaluation is presented. The only results indicated are that, "[m]ore than half of the employees who strengthened their basic educational skills through the program went on to complete their GED"(Rosenfeld 1987, p. 11).

The Business Council for Effective Literacy (1987) reports on the role of unions in providing adult basic skills education. Launched in 1985, the **Consortium for Worker Literacy** in NYC was created through the cooperation of eight unions (Teamsters Joint Council 16, International Ladies Garment Workers Union, United Auto Workers District Council 65, American Federation of State County and Municipal Employees District 1707, Amalgamated Clothing and Textile Workers Union, United Auto Workers Local 259, Health and Hospital Workers Union District Council 1199, and Hotel and Restaurant Workers Union). Consortium activities are reported by BCEL to compromise one-third of the total adult education classes provided by the New York City Board of Education. The Consortium also "works with CUNY (City University of New York) to develop research on questions of direct concern to its basic skills efforts" (Business Council 1987, p.5). No research results are provided, nor is there any indication of program practice evaluation.

In "Adult Literacy: Industry-Based Training Programs," Fields, Hull, and

Sechler (1987) discuss the operation and evaluation of seven industry-based programs. As part of their research for the National Center for Research in Vocational Education at Ohio State University, they interviewed company officials, plant managers, union officers, literacy instructors and employees to find out what happens in industry-based literacy programs.

Texas Instruments, Inc.

The Alliance for Effective Education is a result of the collaboration between Texas Instruments and Austin's local government and education facilities. Austin Community College and Texas Instruments joined forces in 1983 and established the **Basic Skills for Test Operator's Program** which includes ESL (English as a Second Language) training and GED classes for the company's Thai and Hispanic workers, as well as other employees who wish to get their high school equivalency degree. Participants all must undergo a formal skills assessment; one test used is the Flannigan Industrial Series which tests for math level and related technical areas. Instruction is provided by the college and the teachers focus on (1) aiding learners in setting goals, (2) keeping courses and content flexible, (3) providing individualized instruction, and (4) guiding and motivating learners (Fields et.al. 1987, p.31). No systematic evaluation of impact on productivity was attempted. Some rough evaluation indicators of the program's success were reported by the Human Resources Department. It

was noted that employees who participated in the program, "(1) passed the test operator's program at a 100 percent success rate, while nonparticipants did not; (2) show improved job satisfaction on attitude surveys; (3) show satisfaction with training during performance reviews; and (4) show improved work performance as reported by supervisors" (Fields et.al. 1987, p.31). How the Human Resources Department came to these conclusions is not indicated. Specific details on the degree of impact for program participants is not discussed.

Philadelphia Hospital and Health Care District 1199C

District 1199C of the Nation Union of Hospital and Health Care was established in Philadelphia in 1974 to win for its members the right to advance themselves economically and socially by providing them with the educational opportunity needed for higher-paying jobs in the health care field. Courses focus on "training at a post-high school level for 15 occupations in the health care field" (Fields, et. al. 1987, p.10). Training also concentrates on basic skills. The program serves several hospitals and all union members who wish to participate. Classes do not always take place at employees' work-sites, nor can students participate in the program during work hours. Commitment to the program has to be on workers'own time.

Learner progress is the only aspect of the program which is evaluated formally. Evaluation of students' progress in basic skills classes is

accomplished through instructor testing and GED exam results. No mention is made of the nature of these results. Fields reports some positive employer feedback on participant performance, but again no details are offered. Program effectiveness is measured by "the demand expressed for the fund's basic skills classes"(Fields, et. al. 1987, p.12). In other words, the program is believed to be effective when it has a long waiting list. Some anecdotal results are reported. One such report indicated "[a] freak experience occurred with one Pre-Allied Health class"(p.12). All of the students in this particular class showed an increase in their basic skills and were hired. However, none of their jobs were in the health care field. Fields hypothesizes that "Christmas time tempted them away from training further to accepting seasonal employment"(Fields et.al., p.12). No discussion occurs of other equally viable hypotheses. For example: (1) the program may have been effective in helping students improve some basic skills but not health care related basic skills, (2) the health care profession did not pay enough, or (3) the only work that the students could get as a result of the program was seasonal work.

Onan Corporation

The Onan Corporation manufactures portable electric generators, and gasoline and diesel engines. The company first introduced a basic education class in 1982 as a result of employee frustration with the rapidly changing and increasingly complicated technologies being introduced to

their workplace. "A needs assessment was performed by consultants, involving over 600 workers to determine their basic education needs and interests. Results prompted the plant to offer a more comprehensive on-site program that included basic education and pre-technical courses"(Fields et.al. 1987, p.5). The pre-technical program **Manufacturing Education Program (MEP)** is offered mainly to the employees in the Electrical Products Division, and the basic skills program, **STEP (Strategic Training and Education Program)**, is offered to maintenance employees so they can understand new automated machinery coming into the plant. The company hires instructors from the Minneapolis area school districts.

The evaluation of Onan's Manufacturing Education Program (MEP) has "been limited to the assessment of course management and preparation solicited by instructors of students at the end of each quarter"(Fields, et.al. 1987, p.8). The students are given a form and are asked to assign the classes a grade from excellent to poor in the areas of administration, content, and applicability to jobs. No program grade results were reported. Fields notes that as of yet, there is no attempt "to draw a direct relationship between basic skills and increased technical capacity of production efficiency" (p.8). However, Fields reports that the company has plans to interview program "regulars" in order to determine whether or not the content of the courses prepared them for more advanced classes. No mention is made of the evaluation process **STEP** undergoes.

Planter's Peanut Company

The **Planters Employee Training Program (PET)** is one of the more established workplace literacy programs in the United States. In 1978, the Planters Company, the Suffolk City school system, and the Virginia Department of Education joined forces to fight against the "low education level - over half, 53.2 percent, of the population in the city of Suffolk have not completed high school, according to the 1980 census"(Fields, et. al., 1987, p.13). Program's objectives include helping employees "improve their reading, writing, and math skills in order that they may:

* perform better in their present jobs,
* become eligible for promotion,
* become better citizens of the community, and
* experience the personal satisfaction that comes from learning"(p.14).

The only documentation supplied for program impact were anecdotes about learner job-skill gains such as "A packer who was taught to read was able to determine where the boxes are going and to pack them appropriately"(p.15). While this and other such reported gains were undoubtedly significant successes for the employees, to use them as sole evaluative measures is a weak indication of overall program effectiveness. Fields, et. al.(1987) report that further interviewing of PET participants indicated that some became more involved in the community and were

"able to print their names and fill out forms, knowing for the first time what a stop sign means and being able to identify their name in print on a time card or check"(p.15). No mention is made of the percentage of learners demonstrating such gains.

Polaroid Corporation

During the 1970's, Polaroid Corporation began a literacy program consisting of an ABE (Adult Basic Education) class, and ESL (English as a Second Language) class and a GED (General Education Development) class. The program is quite structured; there is a **Fundamental Skills Program** and a **Technology Readiness Program** which act as the preliminary bases for the more advanced **Technician Training Program** and the **Polaroid Internal Technical Cooperative Program (PITCOP)**. Despite the highly structured organization of the literacy programs, "[m]uch of the program evaluation is informal; it consists of supervisors' acknowledgement of improved employee performance" (Fields et.al. 1987, p.20). No mention is made of the use of any structured methods to determine employee performance. The **Technology Readiness Program** is reported as developing "a formal evaluation process -- one that allows employees to reflect on learning"(p.20), but how employees will reflect and how that reflection will indicate program effectiveness is, again, not mentioned.

R.J. Reynolds Tobacco Company

R.J. Reynolds Tobacco Company began offering ABE courses in

1983 in conjunction with the Adult and Continuing Education Division of Forsythe Technical College. The program, **New Generation Training**, focuses on improving basic skills, occupational skills, practical skills, and health-related needs. The classes are conducted in "direct instruction in an interactive mode between the instructor and one or two students"(Fields, et. al., 1987, p.23), and use the Laubach Way to Reading program. The Adult Basic Learning Examination (ABLE) was administered at both the start and end of the program. The scoring on the preprogram test determined in which class the learner would be placed and the post-program test scores were used to measure learner gains. No data were reported concerning these scores, their accuracy in determining learner needs, or the degree of learner improvements. There is no mention of any other evaluation techniques for either the learners or the program itself.

Rockwell International

Rockwell became actively involved in the upgrading of basic education skills in 1978 when, in response to a perceived oil boom, it joined a consortium of federal, state, community-based, and organized labor organizations to establish the **Rocky Mountain Energy and Environmental Technology Center (RME and ETC)**. In 1983, the center's name changed to **Technical Education Center (TEC)** and it now works with the Community College of Denver and the Training, Administration, and

Assessment (TAA) office of Rockwell's Rocky Flats Plant. According to Fields, et. al.(1987), TAA is responsible for not only keeping training program records, but also the assessment of employees and the development and delivery of train-the-trainer classes. To date there has been no means of assessing TEC's effectiveness other than the "evidence" that union and management relations have reportedly improved because of the program. As a result of this strengthened relationship, TAA is planning "to develop a tracking system on employees in the program and then measuring results at six-month intervals for comparison with nonparticipants" (Fields et.al., p.28).

Canadian Programs

Patterson (1989), for the Canadian Office of Planning Services, reviewed existing research and the current literacy training practices in Canada to draw conclusions and make recommendations for future literacy initiatives. Patterson reports that "[w]hile recent years have seen an increased amount of activity in Canada in the area of adult literacy, involvement in the area of workplace literacy is relatively new"(p.11). She briefly describes four of these programs: Frontier College's Learning in the Workplace Program, Laubach Literacy of Canada's Industrialized Tutoring Program, Ontario's Basic Skills in the Workplace Program, and Douglas College's Basic Skills Upgrading Program.

Patterson indicates that in 1985, a survey was sent to individuals

in the workforce asking if they had ever participated in a job-related training program. Only 8% of the people surveyed actually participated in a program. Patterson (1989) concluded that "there is little indication that this training benefited workers with lower skill levels"(p.13).

Summary of Evaluation Results

Several trends are apparent from examination of current workplace literacy program descriptions and evaluations.

1) Programs able to demonstrate effectiveness require significant resources in terms of learner time on task. Effective programs average from 50-100 hours of instruction per average 1 year of learner gain. Traditional business short courses are not particularly useful. Effective private programs report learner cost figures more than double those of public programs.

2) Effective programs integrate basic skills training with workplace technical training. This usually occurs with an on-the-job training linkage and analysis of the basic skills needed on learner jobs. Counseling is also integrated in the more effective programs.

3) The majority of workplace literacy programs described in the available research literature tend to report no rigorous evaluation data. When programs are evaluated, assessments are often limited

to the completion of questionnaires, surveys of program participants, and anecdotal reports of effectiveness. Occasionally a standardized reading test provides an indication of learner gain in general reading ability.

4) Only a few evaluations provide follow-up data on the impact of programs on learner job performance, retention, or earning power.

Evaluation Plans

The eight volume JTPA evaluation plan (Washington State Dept., 1986) is the most thorough guideline for evaluation the effectiveness of vestibule literacy programs. It's very thoroughness, and the difficulty of keeping careful records and control group data in the face of federal counter incentives and limited resources may make such evaluations close to impossible, however.

In addition, proponents of alternative assessment methods suggest that traditional assessment may miss essential aspects of program success. For example, Sterling (1989) points out that Headstart demonstrates its true effectiveness several years after children leave the program. In addition, traditional test-driven assessments miss gains in learner chosen goals, which can only be determined by careful and continued interview using

ethnographic methodologies.

Not all program evaluations are published. Corporations with workplace literacy programs sometimes hire consultants to evaluate programs with the provision that results must be the sole property of the funder. Mikulecky and colleagues* have performed several such evaluations using a version of Stufflebeam's (1974) Context, Input, Process, Product evaluation model modified for use with workplace literacy programs.

In brief, the evaluation model employs the use of interviews, document analysis, observations, and test data to determine:

1) the degree to which all involved with the program understand and share program goals;
2) whether the resources in terms of personnel, materials, learning environment, and learner time are sufficient, given current knowledge, to achieve the goals;
3) whether the learning processes and methods employed are sufficient to accomplish the goals; and
4) what evidence exists that goals have actually been accomplished.

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* Mikulecky & Ehlinger with electronics occupations, Mikulecky & Philippi and Philippi, Mikulecky & Kloosterman with automotive occupations, Mikulecky & Helmsly with health service occupations,

Program Goals: Interviews, analysis of memos and planning documents, and early program observations often reveal that significant differences about program goals exist among funders, supervisors, instructors, materials designers and learners. Evaluation feedback during early program stages often initiates necessary clarification among program planners and participants. In some cases goals are expanded, in some cases goals are refined, and in some cases new vendors are sought.

Resources: Early examination of resources often reveals that resources are insufficient to accomplish goals espoused by program planners. Typical deficiencies are: 1) insufficient learner time to accomplish purported goals, 2) lack of learning materials or resources to develop materials which match the workplace literacy goals, and 3) hiring instructors with experience in general basic skills instruction but little knowledge or expertise about workplace literacy program development.

Learning Methods: When instructors do not understand or share program goals and resources are insufficient to meet these goals, observation of classes and interviews with learners are likely to reveal similar inadequacies. Examples are: 1) Insufficient learner practice time with literacy and too much class time allocated to discussion, 2) Teaching

general reading instruction with school books, off the shelf materials, or sometimes materials the instructor thinks will be of motivational interest to learners, and 3) Little feedback on learner accomplishments (often instructors are unable to comment upon what individual learners can and cannot do). Effective programs employ a mixture of workplace materials or modified workplace materials matched to jobs, some general materials (especially for very low level readers), and sufficient learner practice time to allow reasonable expectation of success. The learning time and materials often revolve around using reading, writing, computation, and some team work to solve problems similar to those encountered on the job or at home. Some effective programs even manage to expand practice time through homework.

Evidence of Goal Attainment: Effective programs have gathered baseline data on the reading abilities and the reading practices of learners. This is accomplished through formal tests, informally constructed tests related to workplace expectations, and interviews with learners and sometimes supervisors. This information establishes a base for later comparisons. Later results can reveal that programs work most effectively for a particular ability level of learner. Some goals may be found to be achieved (i.e. job reading gain and application of learning strategies to the job), while other goals (i.e. general reading gain or educational attainment) may require more time. One program with which the author is currently

working is attempting to have entire work teams enter a combined technical training and workplace literacy training program. It is hoped that internal politics will allow evaluators to gather baseline data on defect rates, down time, and general productivity compared to teams not yet in training.

The workplace literacy program evaluation model outlined above has the advantage of being both formative and summative. Potentially serious flaws in program design, which have been found in every program evaluated by the author thus far, can be addressed early while modification is still possible. In addition, the model involves program planners at the outset in gathering baseline data related to articulated program goals. This is often a political process. Sometimes difficulty in gathering baseline data unearths issues which must be dealt with before program delivery and success is likely.

Evaluation of workplace literacy programs involves a commitment on the parts of all involved to determine the degree to which programs are effective. This will require several changes in attitude and practice. Initially, sufficient resources must be allocated for formative and summative evaluation. In the experience of this author, 2-3% of program development costs is a typical figure for effective evaluations. More complicated evaluations, of course, cost more. Attitude changes must also occur. Business leaders sometimes look at literacy programs as either a

charity expense or as something one sub-contracts to a vendor. Program quality will improve when funders view workplace literacy programs the same way the view any other cost of business which must be routinely evaluated and monitored. Vendors who are unable to perform are replaced in other areas of business. A degree in caring is not sufficient. Finally, vendors and instructors (often from local Adult Basic Education agencies) need to understand that workplace programs require a different way of doing business. Though the relationship between instructor and learner is still key, it is insufficient to guarantee program effectiveness. Business and union funders have every right to expect reasonable answers about how long gains will take, what resources will be required, and who will have access to evaluation information. Many program providers have never needed to consider such questions and indeed find such questions somehow distasteful. To become effective in this new area, program providers must instead adopt a trouble-shooting attitude toward their own programs. This means regularly asking: "What is working and what is not?" and "How do I really know?"

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