DOCUMENT RESUME

ED 410 863 HE 030 459

AUTHOR Hickman, Randall C.; Quinley, John W.
TITLE A Synthesis of Local, State, and National Studies in Work Force Education and Training. AIR 1997 Annual Forum Paper.
PUB DATE 1997-05-00
NOTE 21p.; Paper presented at the Annual Forum of the Association for Institutional Research (37th, Orlando, FL, May 18-21, 1997).
PUB TYPE Reports - Descriptive (141) -- Speeches/Meeting Papers (150)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *College Role; *Community Colleges; Content Analysis; Economic Development; Educational Policy; Institutional Mission; *Job Training; *Labor Force Development; Meta Analysis; Needs Assessment; Research Methodology; Research Needs; Role of Education; *School Business Relationship; *School Community Relationship; Training Objectives; Two Year Colleges
IDENTIFIERS *AIR Forum

ABSTRACT

This study investigated what the workforce education, training, and retraining needs of businesses and organizations in the United States are, and how well community colleges are meeting these needs. Conventional and meta-analytical methods were employed to analyze a sample of 10 local, state, and national studies in workforce development with a secondary analysis conducted for the purpose of quantitatively and qualitatively integrating the findings. Content analysis methods were used to provide an analysis of survey comments and other qualitative data in the studies. The results of the synthesis supported two general conclusions: (1) community colleges are responding to the needs for workforce education and training for all types and sizes of business and for specific training needs; and (2) they are meeting the needs of business by providing customized, high quality, flexible workforce training programs. Additional research is suggested to validate the extent to which employers across the country agree in their perceptions about work force development needs and issues and there should be a systematic exploration of the agreement of the perceptions of employers and community college administrators concerning the central issues in workforce development. (Contains 28 references.) (Author/JLS)

A SYNTHESIS OF LOCAL, STATE, AND NATIONAL STUDIES IN WORK FORCE EDUCATION AND TRAINING

By

Randall C. Hickman, Ph.D.

John W. Quinley, Ed.D.

Abstract

The two major purposes of this research were to generate a larger, more coherent picture of the growing body of workforce development research and to help identify areas where further workforce development research is needed. This research helps to answer two core questions concerning workforce development:

- What are the workforce education, training, and retraining needs of businesses and organizations in America?
- How well are community colleges doing in meeting these needs?

Employing both conventional and meta-analytic methods, the research subjected a judgmental sampling of local, state, and national studies in workforce development -- conducted from the perspectives of providers and customers of workforce education and training -- to a secondary analysis for the purpose of quantitatively and qualitatively integrating the findings. Content analysis methodologies were employed to provide an analysis of survey comments and other qualitative data. The findings yield a clear and generally consistent picture across the studies of a national community college system responding effectively to significant training and retraining needs in all industry segments. In addition, areas needing further research were identified.

for Management Research, Policy Analysis, and Planning

This paper was presented at the Thirty-Seventh Annual Forum of the Association for Institutional Research held in Orlando, Florida, May 18-21, 1997. This paper was reviewed by the AIR Forum Publications Committee and was judged to be of high quality and of interest to others concerned with the research of higher education. It has therefore been selected to be included in the ERIC Collection of Forum Papers.

Jean Endo
Editor
AIR Forum Publications

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INTRODUCTION AND PURPOSE

The focus of the economic and community development mission and role of community colleges, historically and currently, is the education of students and the training of employees to compete successfully in tomorrow's world of work. The volume of such activity at community colleges continues to increase, clearly reflecting the great interest among corporate and non-profit clients who look to community colleges to meet their unique workforce development needs (Community College Roundtable, 1994).

As policy makers -- at community colleges and elsewhere -- continue to expand their efforts in support of the education and training needs of the workforce, researchers have been called upon to provide information about the extent and types of training needs and about the success of community colleges in meeting these needs. As a result, the body of workforce development research concerned with the community college as a provider of workforce education and training is growing (Deegan, 1988; Kantor, 1991; Lynch, Palmer, & Grubb, 1991; Dilcher, 1993; Doucette, 1993; Wismer & Zappala, 1993; Quinley & Aymond, 1993; Bernier, Jackson, & More, 1994; Falcone, 1994; Quinley, 1994; Barber & Quinley 1994; Clagett, 1995; Iowa Association of Deans and Directors of Continuing Education, 1995; Quinley & Barber, 1996).

These studies represent a substantial body of research results concerning workforce education and training, conducted at local, regional, and national levels, by the community colleges themselves, public schools, governmental agencies, private organizations, and other institutions. What is needed now is a broader picture: a quantitative and qualitative synthesis of the findings of these studies.

The two major purposes of this research were to generate a larger, more coherent picture of the growing body of workforce development research and to help identify areas where further workforce development research is needed. This research helps to answer two core questions concerning workforce development:

- What are the workforce education, training, and retraining needs of businesses and organizations in America?
- How well are community colleges doing in meeting these needs?

An additional purpose of this study was to explore the value of meta-analytic techniques and the meta-analytic perspective for integrating research which is not experimental or quasi-experimental in nature, but descriptive. In recent years, a body of statistical procedures – "meta-analysis" -- has been developed as a result of a concern to provide means for a more systematic, coherent and quantitative integration of experimental and quasi-experimental research concerned with causal questions and explanatory issues, particularly in the health sciences and social sciences. While meta-analytic techniques have been clearly demonstrated to be very powerful in assisting the effort to better understand what a body of research has to say about causal matters (Cook et al., 1992; Rosenthal, 1984), little effort has been made to determine how such techniques may be of assistance to descriptive concerns.

METHODOLOGY

Selection and Evaluation Criteria

A judgmental sampling was considered most suitable for the purposes of this research, permitting the authors to draw upon their familiarity with the workforce education and training research to help ensure a sample which would be fairly representative, but which would also provide a good opportunity for the difficulties inherent in synthesizing this research to emerge.

Since one of the goals of the study was to examine workforce development from several perspectives, selected studies included those which gathered data from the clients (employers) and/or providers (community colleges) of workforce development services. The selection criteria regarding subject matter, perspective, and target population provided necessary conditions for inclusion in the sample, subject to the additional qualification of adequately meeting concerns for quality. Since the sample included studies designed from the client and provider perspectives, it was effectively comprised of two sub-samples of studies. Although there was some overlap with respect to the variables measured, the studies within each sub-sample had more in common with each other than with studies in the other sub-sample.

The studies subject to selection were evaluated on important dimensions such as sampling methodology, design of data collection instrument, and response rate. As a context for evaluating the quality of the studies, a version of the "threats-to-validity" approach (Cook & Campbell, 1979) was employed. Under this approach, studies were evaluated with respect to typical validity threats, in the form of "hurdles" which the studies had to pass before inclusion in the sample, rather than scores which could be used to adjust the findings of the studies. Since the studies being evaluated were descriptive in nature, many of the validity concerns typical in evaluating experimental or quasi-experimental research were not relevant here. The difficulty of securing adequate information concerning the design and execution of the study was, occasionally, an obstacle to thorough evaluation. Variation among the studies in the sample regarding the extent to which findings were completely reported reduced in some cases the size of the sample for integrating the findings for some variables.

Analysis of data

Both conventional and meta-analytic methods for analyzing data and interpreting findings were employed. The meta-analytic perspective and associated techniques were drawn upon where issues relating to the integration of findings were paramount. Consistent with general practices in meta-analysis (Cook et al., 1992; Cooper, 1984; Glass, 1977; Hedges, 1986; Hedges & Olkin, 1985; Rosenthal, 1984), decisions about appropriate forms of analysis to be used when integrating and interpreting findings took into account the differences in design and methodology across the studies.

After an assessment of the selected studies on the relevant design and methodological dimensions, common variables for which integrated quantitative findings could be meaningfully reported were determined. The absence of significant variation in the design or methodology -- with the exception of sample size -- of the studies which contributed data for the integrated findings meant that the findings of individual studies needed to be adjusted only to take account of differences in sample size prior to integration with the findings from the other studies.

Given the objectives of this study, the authors felt that more was to be gained by somewhat relaxing comparability rules in order to maximize the amount of pooled data to achieve greater returns from the small sample of studies selected for synthesis, though this may have contributed heavily in some cases to variation in the findings. Fortunately, the similarity in motivation and the research questions guiding the selected studies resulted in considerable commonality with respect to the variables, particularly for the sub-sample surveying employers, though some differences in the particular research questions investigated and/or the emphasis given to certain questions resulted in some variables being less widely shared by the studies in the sample.

The findings for the pooled quantitative data reported for the sample of studies were derived from the findings for the individual studies -- proportions -- weighted by the sample size of the study which contributed the particular finding. Although there are other defensible approaches for weighting study findings, this straightforward approach was deemed adequate given the purposes of the study. In addition, correlation analysis revealed no consistent pattern of correlations between sample size and study finding; thus, alternative weighting schemes which give greater weight to findings based upon larger samples -- differing only in the precise way that sample size is used to determine the weight -- would be unlikely to lead to substantively different results regarding either the homogeneity or the aggregation of the findings. In fact, the homogeneity tests were also conducted with an alternative weighting scheme -- based on the square root of the sample size -- as a test of the sensitivity of the tests and the data to changes in weighting schemes. A comparison of the results of these tests with the results of the method which was chosen showed the findings of the chosen method to be very robust: only in one case did the alternative weighting scheme produce a finding with significant variation which was not identified as significant by the chosen method.

Based on Hedges (1982), χ^2 tests were used for determining the homogeneity of the findings, as defined in the following, where w_i is the relevant weight, p_i the proportion, and $p.$ the weighted mean proportion for the integrated sample or sub-sample. This test employs a weighted sum of squares based on the difference between the

weighted mean proportions for the variables for the entire sample of studies and the findings of the individual studies. If all the studies in the integrated sample or sub-sample share a common proportion, the H statistic has approximately a χ^2 distribution with k-1 degrees of freedom.

$$H = \sum_{i=1}^{k} w_i(p_i - p.)^2$$

Findings which exhibited excessive heterogeneity across the sample of studies are reported and discussed with the other findings of the integrated sample, although such findings are less readily interpretable or generalizable. When the findings for a variable show significant heterogeneity, the integrated sample finding -- a weighted mean -- cannot be generalized to a population in any straightforward manner. The variation in such findings would be too large to reflect random sampling error and must reflect some systematic sources of variation due to between-study differences with respect to study characteristics such as sample composition (i.e. population sampled), operationalization of variables, measurement reliability, or other characteristics.

Most of the qualitative data in the studies included in the full sample was also generated by surveying samples from target populations. However, differences in design and instrumentation meant that there was no good analogy in the case of the qualitative data with sample size as an indicator of the weight which should be given to a particular study finding. Consequently, no effort was made to adjust study findings involving qualitative data for differences in sample size among the studies which collected qualitative data. However, the similarity of purpose across the studies which collected qualitative data resulted in common themes in the data.

CHARACTERISTICS OF THE SAMPLE OF STUDIES

Studies in the Sample

Abbreviated citations for the ten studies selected for the sample are used in this report; complete citations are provided in the references.

The data for all the studies were collected over a five year period, from 1991 through 1996. The studies can be grouped into two major sub-samples by the nature of the respondents: (1) employers and other service recipients; (2) community college administrators, primarily continuing education deans and directors. Table 1 provides descriptive information concerning study characteristics, including target population, sample size, response rate, and methodological approach.

Table 1

Characteristics of the Studies in the Sample

Study	Target Population	Sample Size	Response Rate	Methodological Approach
Community College Sub-sample				
Colorado Study (Kantor, 1991)	Community colleges	14	93.3%	Survey
League Study (Doucette, 1993)	Community colleges	763	71.8%	Survey
Employer Sub-sample				
Charlotte Public Schools Workforce Study (Quinley & Aymond, 1993)	Employers in general	387	9.3%	Survey
CPCC Focus Group Study (Quinley, 1993)	Employers and other community sectors	36 groups	N/A	Focus group
Michigan Study (Wismer & Zappala, 1993)	Employers served by community colleges	442	50.0%	Survey
AACC/DOL Study (Falcone, 1993)	Community colleges/ employers/others	N/A	N/A	Discussion groups
CPCC Employer Study (Quinley, 1994)	Employers in general	592	14.2%	Survey, written comments
Maryland Study (Clagett, 1995)	Employers served by community colleges	561	54.9%	Survey, written comments
Charlotte Chamber Study (UNCC Urban Institute, 1996)	Employers in general	527	13.2%	Survey written comments
National Workforce Study (Quinley & Barber, 1996)	Employers served by community colleges, Community colleges	2,473 56	52.6% 53.2%	Survey, written comments, essays

All of the studies concerned the types and scope of skills needed in the workforce and the education and training needs of employers. The fact that the studies differed somewhat by the target population and methodological approach serves to strengthen the overall conclusions.

The mailed survey was the most common approach to collecting information across the sample of studies, though other methods were used as well, including focus groups, discussion groups, and written essays. These approaches resulted in four studies collecting quantitative data only, two studies collecting qualitative data only, and four studies collecting both quantitative and qualitative data.

The sample size for the studies which surveyed employers ranged from 387 to 592 respondents in the regional studies, 442 to 561 individuals in the state studies, and 2,473 employers in the National Workforce Study. The sample size for studies which sent surveys to community college administrators ranged from 14 in the Colorado Study to 763 in the League Study. The extent of written comments also saw wide variation in the studies which used this method.

The response rate across the studies also varied widely. As expected, the studies which sought responses from community college administrators had the highest response rate, ranging from 71.8 percent in the League Study to 93.3 percent in Colorado Study. Studies that sought responses from employers that were previously served by the community college registered response rates from 50.0 percent in the Michigan Study to 54.9 percent in the Maryland Study. Studies that surveyed employers in general saw response rates ranging from 9.3 percent in the Charlotte Public Schools Study to 14.2 percent in the CPCC Employer Study.

Selected Data Elements

The common concerns motivating workforce development research helped to ensure that the studies included in the sample had considerable commonality with respect to the variables measured. However, important differences in the nature of the target populations -- employers served by community colleges, employers in general, or community college administrators -- meant that some of the variables were necessarily different. Common data elements included the primary business area and size of the firm; the extent of current training needs; satisfaction with and perceptions of the training services provided; the goals pursued by training; the reasons for choosing community colleges as the service providers, and common factors that were seen as barriers impeding success or elements promoting success.

Some studies, however, gathered more detailed, specific information concerning these variables, as well as data on additional variables (e.g., comparisons of skill levels of new hires today with hires five years ago, employer's level of familiarity with workforce training programs, the availability of employees with certain skill levels, the value of new instructional technologies for employee training, and the desired mix of credit and non-credit offerings). Since there were too few studies in the sample which collected data on these diverse, but related variables, the findings for these were not reported.

FINDINGS

The findings for the core variables for the studies in the employer sub-sample showed considerable consistency overall. However, analysis did reveal statistically significant variation in the findings for most of the variables reported here. Although a lack of better agreement among the operational definitions employed in the studies for the variables cannot be ruled out as a source of some of this variation, the variation may also reflect the statistically significant between-study variation with respect to sample composition and with respect to primary business area and size of business. Both of these variables are potentially important covariates for many of the variables for which integrated findings are reported here.

Primary Business Area and Size of Businesses Sampled

The samples in the studies which surveyed employers, while differing in scope (local, regional, or national), generally included employers from all sectors of the economy, who represented firms of all sizes. However, the distribution by primary business area varied considerably among the studies and proved to be

statistically significant. There was some tendency for concentration of respondents in the industrial/manufacturing sector in studies which had a smaller proportion of their samples from small firms, which may reflect nothing more than the tendency of manufacturing and industrial firms to have more employees than firms in other sectors of the economy.

There was even greater variation among the samples of the studies concerning the size of the employer's firm, which also proved to be statistically significant. Since there is likely to be some relationship between the industry sector and typical firm size, this finding is not surprising in view of the significant between-study variation in the distribution by primary business area of respondent across the studies in the employer sub-sample. Variation with respect to business area and size of firm may help to explain some of the variation in the findings across the studies in the sample for some of the variables.

For the integrated sample, most of the respondents represented industrial/ manufacturing firms (with a weighted mean proportion of 26.7 percent), followed by professional/business/financial services (13.4 percent), government (13.0 percent), health care (12.8 percent), and retail/wholesale (6.9 percent). Concerning size of firm, more than half the integrated sample of respondents (55.5 percent) represented firms with fewer than 100 employees.

Consistent with the distribution by primary business area in the employer sub-sample, the studies which surveyed community colleges and collected quantitative data on this variable reported that the training services offered were concentrated in the manufacturing sector: 39.2 percent of all training services in the League Study, while the Colorado study reported that 50.0 percent of the community colleges in Colorado had provided at least 50 percent of their training services to industrial companies. These studies also reported a secondary concentration in services (24.5 percent of all community college training in the League Study, 21.4 percent of the community colleges providing at least 50 percent of their training services to firms in the service sector in the Colorado study). Concerning the size of firms served, the League Study reported that 38.3 percent of community college training services were offered to companies employing fewer than 100 employees.

Types and Extent of Current Education and Training Needed

Analysis showed considerable agreement concerning the areas where training was needed. Findings were most consistent for the perceptions of employers concerning the skills areas of workplace competency-related education and training needed most or most likely to benefit employers. There was greater variation among the studies in the extent to which respondents agreed on the magnitude of the need for training in these areas.

The need for workforce skills education and training in almost all skills areas was uniformly high in the findings for all the studies in the employer sub-sample. The skill areas measured included basic skills, interpersonal skills, critical thinking skills, business and professional skills, computer-related skills, government regulations, personal skills, technical skills, computation skills, language skills, and other skills. For those skills areas which shared the same definition in the studies, analysis showed significant variation across the studies concerning the extent of need perceived by the employers.

The following table shows the findings for those skills areas measured by all the studies in the employer sub-sample. As measured by the weighted mean proportion for the integrated sample, computer literacy (80.1 percent), interpersonal/team skills (79.5 percent), critical thinking skills (74.9 percent), personal/work ethic skills (67.4 percent), leadership/supervisory skills (67.0 percent) and skills related to the use of quality management concepts (66.4 percent) were the skills areas and workplace competency training areas with the greatest need.

As measured by the homogeneity test statistic (the larger the value of the test statistic, the greater the variation), the studies were most in agreement concerning the extent of the need for training in technical skills, in foreign languages/ESL, workforce training in interpersonal/team building skills and in critical thinking skills, followed by the need for training in using total quality management concepts, personal skills, global understanding, leadership/supervision, computer literacy, and basic skills.[1] Findings for the need for training in basic skills varied greatly in the sample and may reflect substantial differences in the operational definition or some unreliability in the measurement of that variable.

Table 2

Extent of Training Needed by Skills Areas

	Mean*	Range Min	Range Max	Median percent	Standard deviation	H =
Computer	80.1	54.1	91.0	83.0	14.8	105.8§
Interpersonal /team	79.5	68.9	87.0	79.5	7.5	22.5†
Critical thinking	74.9	66.0	82.0	75.1	8.0	20.0†
Personal skills/work ethic	67.4	61.4	80.0	65.6	9.8	33.7‡
Leadership/supervision	67.0	54.1	77.0	67.1	11.5	84.7§
Using Quality Mgmt concepts	66.4	58.8	73.0	65.8	8.6	32.8‡
Basic skills	63.9	40.1	73.9	42.0	19.0	227.1§
Technical skills	58.0	54.0	63.3	57.8	4.7	6.8
Global Underst.	34.7	30.9	55.5	32.0	13.9	74.6§
Foreign Lang./ESL	18.5	16.6	23.0	22.0	3.4	7.7

*Weighted mean percentage of respondents indicating training was "needed" or "much needed, " or "some" or "substantial" need, or needed by at least 25 percent of their workforce.
†Significant at $p < .05$
‡Significant at $p < .01$
§Significant at $p < .001$

Findings from the League Study concerning training services provided by community colleges offer some contrast to the above findings concerning the training needs perceived by employers. According to this study, computer-related training is the second most important training area, accounting for 18.6 percent of the total training (defined as the percentage of the total number of employees trained); it is exceeded only by job-specific training, which comprises 20.2 percent of all training, and followed by supervision/management (14.9 percent), workplace literacy (9.8 percent) and communication skills and interpersonal relations (8.6 percent).

One-half of the studies in the sample provided qualitative data concerning the importance of various skills in the current and future workforce and the types of education and skills training needed. An analysis of this

[1] In order to avoid capitalizing upon chance, significance levels were adjusted according to a standard Bonferroni procedure.

information – primarily from written comments of employers – clearly shows that the skill level of employees is the basic concern of business and industry. Many employers pointed out that they are not as concerned with an employee's educational background as they are with how well an employee can perform.

The importance of specific workplace skills reported in the survey results were closely reflected in the written comments of employers. Computer skills and using these skills to process data were frequently noted in written comments and in focus group summaries. Interpersonal skills, especially the ability to work in teams, was also frequently the subject of comments. In the view of employers, in the past, manufacturing the best product was the most critical factor for success, but today, it is good service. Further, employers reported that when their organizations adopted high-performance businesses practices, an employee's ability to work with others became even more critical.

The necessity of a firm foundation in basic skills was noted time and again by respondents, who expected this foundation to be guaranteed by our educational system. However, employers often complained that the level of basic skills – especially for entry-level younger workers – fell much below expectations. Often, the lack of basic skills was linked with an inadequate work ethic. Many employers expressed dismay at what they felt to be an absence of motivation, discipline, commitment, and concern for the quality of the work done. Employers felt that an adequate work ethic was no less important than appropriate skills.

Employers also emphasized that they need employees who have the ability to think, to creatively solve problems in new ways. Employees must be flexible, responding to frequent changes in market needs.

Employer interest in total quality management concepts was evident in their comments about the workplace. This interest reflects the business environment faced by many companies today: to compete in the global market place, many companies are converting to high-performance or total quality management principles. Employers noted that a transition to a high-performance organization requires extensive start-up education and training and a consistent program of on-going education and training.

Quality of Work Force Education and Training: Factors for Success

In the employer sub-sample of studies, perceptions were quite consistent concerning the quality of the training provided by community colleges. Employers generally rated the quality of such training as good, indicated they were satisfied, and would recommend community colleges. Over nine in ten employers surveyed in these studies rated the quality of community college work force programs highly or would recommend these programs to other businesses. In those studies which gathered additional data on quality, ratings of other facets of community college education and training programs also tended to be consistently high.

The findings for the integrated sample on this variable, presented in Table 3, were quite consistent in general, and the variation across the studies proved not to be statistically significant.

Table 3

Employer Perceptions of Quality of Community College Programs

	Mean*	Range Min	Range Max	Median percent	Standard deviation	H =
Quality of training/ Satisfaction	93.9	84.5	97.0	93.3	5.8	18.0
Would recommend	94.9	92.0	96.0	95.1	2.1	1.3

*Mean weighted percent of respondents indicating quality was "good" or "excellent" or were "satisfied" or "very satisfied" with training.

The League Study of community colleges supported employers' high ratings of community college training services. This study found that community colleges believed they were very effective in meeting the needs of their existing clients (with a mean rating of 4.2 on a scale of 1 to 5, with 1 = "very ineffective" and 5 = "very effective") and generally effective in meeting the overall work force training needs in their service areas (with a mean rating of 3.4 on the same scale).

Although some studies in the sample asked more detailed questions concerning the quality of community college work force education and training programs, only two questions were common to enough studies to be included in the quantitative analysis. However, all four studies which included qualitative data specifically about community college work force development programs included open-ended questions that addressed perceptions of quality.

The comments were overwhelmingly positive and concentrated in three general areas: quality of the program, instruction, and administrative support; responsiveness of programs and individuals; and cost-effective training.

Respondents saw community college faculty as qualified, knowledgeable, committed professionals. Instructors were student- and employer-centered -- willing to quickly design and adopt innovative curriculum and instructional delivery approaches to meet the practical challenges of on-the-job realities. By a large measure, employers considered administrative staff to be innovative, efficient, flexible, knowledgeable, and customer-oriented.

Employers noted that the highly responsive nature of community college work force education and training programs was a top contributor to program success. Businesses and organizations reported that training programs were customized for their needs and conveniently offered on-site. Responsiveness and flexibility were seen to permeate every aspect of the work force development program, including instruction, curriculum content and design, administrative support systems, class delivery approaches, and pre- and post-assessment procedures.

Employer Goals for Work Force Training

There was considerable variation across the studies concerning the proportion of respondents with various goals for work force training. However, there was clear and consistent evidence that the two major goals employers were pursuing when seeking work force education and training were the improvement of employee productivity and the upgrading of employee skills, though there was statistically significant variation in the

proportion of respondents which pursued these goals.[2] For a smaller group of studies reporting findings more completely, these were also the two most important goals, followed by self-enrichment of the employee (median percentage of 42.7) and training mandated by the employee's profession (median percentage of 20.9). A third study which surveyed employers collected similar data supporting the importance of self-enrichment, finding that 70.9 percent of respondents indicated that self-enrichment was driving the need for work force training from "to some extent" to "a major extent."

Table 4

Employer Goals in Seeking Work Force Training

	Mean*	Range Min.	Range Max.	Median Percent	Standard Deviation	H =
Improve performance	69.6	38.5	74.3	73.6	20.5	141.3§
Upgrading skills	61.7	29.9	71.2	44.9	20.9	238.3§

*Mean weighted percent of respondents
§ Significant at $p < .001$

Reasons for Choosing Community Colleges

One of the most consistent findings in the employer sub-sample of studies concerned the characteristics employers expect to find in work force education and training programs, and, hence, their reasons for choosing community colleges. Cost-effectiveness and customization of instruction were the two top reasons given for choosing a community college for work force education and training by the employers surveyed in all the studies in the sample, indicated by 67.8 percent and 56.5 percent, respectively, of respondents in the integrated sample as reasons. Cost-effectiveness was a pivotal criterion used by businesses in choosing a community college for work force education and training. Employers consistently noted that community college work force education and training was the best and greatest return for their investment.

Perceived quality of instruction and past satisfaction with training were also important motivating factors, among the top five most frequently cited reasons in all these studies. These particular findings were also supported by the qualitative data in the sample. These are the same factors rated highly by employers when asked to reflect on the quality of community college work force development programs.

The variation in study findings for the top four reasons – cost-effectiveness, customization of instruction, quality of instruction, and past satisfaction – was not statistically significant. There are good reasons for thinking that the employers' reasons for choosing community colleges as training providers would not be closely related to primary business area or size. Hence, the general absence of significant variation for this variable is understandable, notwithstanding the significant between-study differences concerning the variables primary business area and size of business. Table 5 presents the findings for the integrated employer sub-sample for this variable.

[2] The significance of the homogeneity test statistic for this variable was primarily the result of the Michigan Study, which had findings for this variable widely divergent from the rest of the studies in the sample.

Table 5

Reasons for Selecting Community Colleges as Training Providers

	Mean*	Range Min.	Range Max	Median Percent	Standard Deviation	H =
Cost-effectiveness	67.8	63.8	69.0	68.3	2.8	2.5
Customized program/ responsiveness	56.5	55.3	60.2	59.0	2.6	3.8
Quality of instruction	49.4	44.0	50.0	50.0	3.5	4.2
Past satisfaction with training	43.4	37.0	44.9	42.0	4.0	7.0

*Mean weighted percent of respondents

Usefulness of Meta-Analytic Techniques and Perspective

Examination and analysis of the relevant study characteristics of the studies in the sample produced two major limitations on analysis which greatly influenced the nature of the tasks involved in integrating the findings of the studies and also the extent to which meta-analytic techniques could be fruitfully used.

First, the studies in the employer sub-sample showed little variation in design. While the absence of much variation in design is an advantage in some respects (such as commonality of variables and pooling of data and findings), it is disadvantageous in other respects (such as understanding variation in the findings). Given the primarily descriptive purposes of this study, however, the homogeneity of design across the studies was an important advantage, facilitating the synthesis of the findings.

Second, there were no confidence levels or significance testing reported for the statistics reported by the studies in the sample. The absence of confidence levels among the reported findings for the sample of studies limited the applicability of meta-analytic procedures.

The joint impact of these two limitations meant that the problems posed by integrating the findings in this study were not those typically found in meta-analysis. Hence, many of the statistical procedures which have been developed to support meta-analysis had no application here. The first limitation also meant that there was little opportunity to explore whether (and how) differences in the design of the studies could be related to variation in the findings, though this was not a primary purpose of this study. A larger, more comprehensive sampling of work force development research might have presented a greater opportunity to produce review-generated evidence in this respect. Given the primarily descriptive concerns of this body of research, however, even a larger, more comprehensive sample would be likely to present limited room for the application of current meta-analytic techniques.

The fact that meta-analytic procedures have been developed almost exclusively in the context of experimental research also limited the extent to which these procedures had applicability here. Meta-analysis in the context of experimental research, for example, may be concerned primarily with adjusting effect size findings from a sample of studies employing treatment and control groups in order to produce an overall estimate of the effect size for a treatment. The descriptive purposes of work force development research presented different sorts of problems, such as estimating proportions for a population, based on findings for similar, but not identical

sampled populations. Consequently, typical meta-analytic procedures -- such as testing for the homogeneity of effect sizes -- were modified as necessary to permit their application to the purposes of this study.

Despite these difficulties, the particularly important concerns central to meta-analysis and the integration of findings from different studies -- commonality of variables, differing sample sizes, and homogeneity of findings -- were meaningful in the context of this study and were adequately addressed.

It is too early to tell whether researchers will eventually come to regard meta-analysis as a valuable tool for synthesizing the results of descriptive research. It is the view of the authors of this study, however, that while meta-analysis and meta-analytic techniques as currently developed are more useful for researchers concerned with experimental or quasi-experimental research, they are valuable for synthesizing descriptive research when combined with traditional methods of analysis.

CONCLUSIONS, SUMMARY AND DISCUSSION OF RESULTS

The results of this synthesis of work force development studies support two general conclusions.

Conclusion 1: The community college is responding to needs.

- *The community college response for work force development parallels the need in respective service communities; community colleges are responding to the needs for work force education and training for all types and sizes of business and for specific training needs.*

Community colleges provide work force education and training to employers and employees in all business areas and to all sizes of businesses in the United States. In the sample of studies, the largest concentration of services was provided to the industrial/manufacturing sector, followed by services, government, and health care sectors. The distribution by type and size of business varied significantly among the studies in the sample. This variation was a reflection of several factors: the different communities served by community colleges; the different regulations community colleges must operate within; and the difference in sampling among the studies.

While just over one-half of the respondents in the integrated employer sub-sample were from small businesses, with 100 employees or less, the significant variation in the findings for this variable makes generalization problematic. However, this focus of community college work force development programs on small businesses and organizations is important for at least two reasons. First, small businesses are the acknowledged engines of economic growth in the United States (AACC, 1993). Second, according to a recent Bureau of Labor Statistics study, small businesses are much less likely to conduct training in all areas than are larger establishments (Frazis, et al, 1995).

The study found clear and consistent evidence that the two major goals employers were pursuing when seeking work force education and training were the improvement of employee productivity and the upgrading of employee skills – goals directly related to the ability to compete. Although not as consistently surveyed across the studies, self-enrichment or personal development of the employee was also an important reason. About two-thirds of the employers indicated that to improve performance or to upgrade skills was a work force goal; just under one-

half of the employers indicated that the self-enrichment of employees was an important goal of work force education and training.

To bring their work force up to the needed skills levels, employers are looking for high quality, cost-effective, conveniently located and scheduled work force education and training programs which are customized to meet their specific needs.

In the sample of studies, just over two-thirds of the corporate and non-profit clients chose community colleges to meet their need for work force training because they perceived community colleges to be a cost-effective value for their investment. Just over one-half of the employers chose community colleges because the training program was customized to meet specific needs or offered on-site. Quality of instruction was the reason given for choosing a community college by just under one-half the respondents. Just over four in ten respondents choose a community college due to past satisfaction with the education and training provided.

The need for work force skills education and training in almost all skills areas was uniformly high. Of the 10 skills areas included in the analysis, the percentage of employers responding "needed" or "much needed" or responding "some" to "substantial need" ranged from just under two-thirds to just over three-fourths. Areas for which about three-fourths of the employers indicated that there were training needs included computer skills, interpersonal/team building and critical thinking; about two-thirds of the employers indicated training needs in personal skills/work ethic, leadership/supervision, total quality management principles, and basic skills. The magnitude of this need is growing, as advancing technology, fast-paced innovation, global competition, and substantial changes in the composition of the work force continue to require on-going training.

The highest need area, computer skills, reflects the continued modernization of the work force through technology. Computer skills training is one of the most common courses offered by community colleges for work force development (Doucette, 1993). Employers often commented that computer skills in the future will be a requirement of nearly all jobs. Employers also frequently noted that employees must be able to use the capabilities of computers in order to process the ever growing volume of information.

The increasing use of total quality management principles in organizations reflects the competitive business environment many companies face today. A company's transition to high-performance practices requires extensive start-up education and training and a consistent program of on-going education and training. A high-performance organization, by necessity, needs extensive education and training in several of the skills areas listed in the sample of studies: interpersonal skills, critical thinking, personal skills/work ethic, and communication skills. High-performance companies conduct and contract for education and training at a higher rate than do companies that do not regularly employ high-performance business practices (Phipps, 1995).

The training areas, global understanding and English as a Second Language (ESL), were needed relatively less often by employers. The level of training needed in these areas is probably more sensitive to the location and/or type of business than are other skills areas. As the globalization of the economy continues, the work force of tomorrow will be expected to have a firmer understanding of the world's cultures than is the case today.

Conclusion 2: Programs are customized, high quality, and flexible.

- *The American system of community college work force education and training is meeting the needs of business by providing customized, high quality, flexible work force training programs.*

The perceptions of the employers were highly consistent concerning the quality of the education and training provided by community college work force development programs. Over nine in ten employers rated the quality of these programs as "good" or "excellent" or were "satisfied" or "very satisfied" with the education and training provided. Similarly, over nine in ten of the employers would recommend a community college work force development program to another employer. The written comments made by employers strongly corroborated the results of the quantitative data. Written comments about program quality overall, the quality of instruction, the quality of administrative support, the responsiveness of programs, and cost-effectiveness were overwhelmingly positive.

These findings were also consistent with reports from community college administrators -- the providers of work force development training. In the League Study, community college administrators gave community college programs a mean rating of 4.2 on a scale from 1, "very ineffective," to 5, "very effective."

NEED FOR FURTHER RESEARCH

This synthesis of a limited sample of work force development research produced a generally consistent picture of substantial training needs and a generally high degree of satisfaction among employers and community college administrators with the performance of community colleges in meeting those needs. However, a closer examination showed some variation in the findings across the studies in the sample, particularly with respect to the goals of employers in seeking work force education and training and the extent of training needs in various skills areas. Variation in the findings in the sample of studies for these two variables was much greater than the variation concerning reasons for selecting community colleges as providers of work force education and training services.

Although the between-study variation in findings for some of the variables reported for the employer sub-sample proved to be statistically significant, limitations on the sample prevented any meaningful effort to explore this variation by means of further analysis. The extent to which this variation in this sample of studies may be the result of between-study differences regarding methodology or other study characteristics is a proper subject for future work force development research. Such factors as the operational meaning given to variables, differences in the composition of the samples (and corresponding target populations), and other study characteristics may have driven differences in the findings. With additional research on this issue, conclusions about the extent to which employers across the country agree in their perceptions about work force development needs and issues may be drawn with greater confidence.

For many of the variables reported here, the findings of the studies which surveyed community colleges supported the findings of the studies which surveyed employers. A more comprehensive sampling of work force development research would have enabled a systematic exploration of the extent to which the perceptions of employers and community college administrators -- two key stakeholder groups -- agree concerning issues central to work force development. A larger sample would also have permitted determination of aggregated results for additional and important variables which are not always the subject of work force development research, such as anticipated future training needs.

The experience of the authors in completing this study has brought them to the opinion that the combination of meta-analysis and traditional methods of analysis has promise as a tool for synthesizing descriptive research. Taking full advantage of that promise hinges not only on the continued development by researchers of statistical procedures for quantitatively integrating findings from different studies, but also on the application of such procedures to comprehensive samples of studies. In this regard, the authors feel that there is much, potentially, be gained by a more extensive effort to sample existing work force development research.

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