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ABSTRACT

While concern for efficiency and productivity and the use of systems terminology are not new, the intensity with which the jargon is used is relatively new. Unfortunately, the technological terms have frequently become distorted and value-laden through attempts to apply them to compelling economic and political issues. As a result, administrative attempts to implement processes associated with the terms as well as attempts to increase teacher productivity have been perceived by teachers as an unreasonable demand to provide more service for less money. This paper relates the terms "accountability" and "productivity" to the educational context, identifies criteria presently used for the measurement of productivity, reports on some of the current practices used to increase productivity, and proposes some directions for future research. The proposed research efforts are concerned with defining productivity, defining programs, adopting more efficient record-keeping systems, understanding the teaching process, examining employee motivation, investigating successful strategies to implement innovative practices, and increasing the activity of teacher organizations in developing strategies for improvement of education. (Author/IRT)

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HISTORY OF PRODUCTIVITY  
AND RESEARCH NEEDED  
IN EDUCATION

A paper presented at the  
Conference to  
Explore Concerns of Productivity  
in Education  
October, 1975

Prepared by  
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## Introduction

Since the advent of Robert McNamara's Systems Approach, "MBO", "PPBS", "Productivity", "cost accounting", "zero-based budgeting", "input", "output", "feedback", and related terms from the business world have again entered the working vocabulary of educators. "Accountability" has been with us for a few years and now productivity has joined it. Callahan (1962) notes that interest in efficiency and productivity has been a conscious concern of school administrators since the early 1900's. While concern for efficiency and productivity is not new and the use of Systems terminology is not new, the intensity with which the jargon is used is relatively new. Unfortunately, the technological terms have frequently become distorted and value-loaded through attempts to apply them to compelling economic and political issues. As a result, administrative attempts to implement processes associated with the terms as well as attempts to increase teacher productivity has been perceived by teachers as an unreasonable demand to provide more service for less money (Selden, 1973). MBO and accountability have been perceived as shibboleths proposed by administrators to eliminate teachers who have given many years of dedicated service to a system which now finds them too expensive. Greider (1972) suggests that teachers tend to use the word "accountability" in the same sense as culpability.

This paper will attempt to relate the terms accountability and productivity to an educational context; identify criteria presently used for the measurement of productivity; report upon some of the current practices used to increase productivity; and propose some directions for future research.

## Accountability

The "accountability movement" in education might be said to have started with Plutarch (Wynne, 1972, p. 30).

Fathers, themselves, ought every few days to test their children, and not rest their hopes on the disposition of a hired teacher; for even those persons will devote more attention to the children if they know they must from time to time render an account.

In more recent times, one of the foremost proponents of accountability has been Dr. Leon Lessinger. His words have fallen upon receptive ears for they come at a time when the public consciousness is focused upon the cost of public services in general and the cost of schooling in particular. Concern was most evident when the relevancy of school curriculum was challenged by students as well as adults. Other evidence is found in the apparent aimlessness of high school graduates reflected in the highly reported, and probably exaggerated, experiments with drugs and sex; the war; and American values in general.

As Neal Sullivan, the former Massachusetts Commissioner, suggested, education is merely being asked to give an account of its stewardship. His definition of accountability is that

every person (or group) in the organization is answerable (or responsible) to some degree, to another (or position) for something (or objectives) expressed in terms of performance levels (or results or achievement) to be realized within certain constraints (Hostrop, et al., 1973).

Varying definitions appear, but the focus has been on schools proving that students at various levels meet some reasonable standard of achievement. Kruger's (Sciara and Jantz, 1972) definition of accountability adds the requirement that the educational institution provide programs which develop the human potential and efficiently utilize the resources allocated

to it. Mortimer (Hostrop, et al., 1973) suggests that while evaluation is concerned with effectiveness, "accountability is concerned with effectiveness and efficiency". In the same article, he suggests that accountability is the legal liability assigned to the performance of a task. Alkin suggests the need for different types of accountability (Hostrop, et al., 1973). He suggests that goal accountability, program accountability, and outcome accountability can be derived from the question, "Who is accountable to whom for what?"

To paraphrase a Biblical saying: As the word came, so the word became flesh. When the word became flesh, education was introduced to the idea of accountability centers, statewide accountability systems (Porter, 1973); the Independent Accomplishment Audit (IAA) (Hostrop, et al., 1973), Performance Contracting, and evaluation models.

One obstacle to the implementation of accountability systems was the reaction on the part of the individuals who were to be held accountable. Turney (1974) indicated that the major flaw is the wide scope of possible meanings. Instead of being accountable to a single-interest group, education is accountable to a number of groups who are rarely in accord. While one group is seeking accountability in terms of fiscal economy, another is seeking larger expenditures to increase educational opportunity. The fact that New York City has a heavy indebtedness--partly as a result of heavy City service salaries--yet hesitates to reduce the work force because of already high unemployment, is an example of a similar situation outside of education. Turney further suggests that strict accountability requires precisely defined and reasonably static targets. These are seldom found in education, partially because they seem antithetical to the concept of education being flexible to meet the needs of the individual. To accommodate

these differences requires strict adherence to an established set of priorities. This has not been possible in the past, and presently seems little likelihood that it will occur in the future. Since priorities must be set via the political process, they are likely to remain constant only as long as the political support remains.

While Lessinger and others see accountability to the student and the public as being one in the same, others see them as two conflicting referent groups and any attempt to serve both is self-defeating. Selden (1973) suggests that the term has become a teacher slur. If one is seeking increased productivity, teachers must be given the necessary authority and responsibility for developing the methods which make them most productive.

#### The State of the Economy

Little can be added to our awareness of the state of the economy than has already been regularly reported in the newspapers. The economy appears to be out of its slump, yet economists differ as to the real strength of the upsurge. The health of the economy and the need and ability to increase productivity of the labor force are inextricably intertwined. Approximately one-half of the GNP and two-thirds of today's work force are applied to services rather than the production of goods. One of every six workers is employed in government and 80% employed at the state and local level. Over 22% of the nation's GNP is presently needed to support these services as compared to 13% in 1950. Between 1951 and 1970, the number of people employed by local government increased by close to 120% (Backmiller, 1975). Despite this increasing demand for public service, Hatry and Fisk (1971) could find "no local government function for which comparative or aggregative, across-the-nation, meaningful productivity data had been

calculated or indeed could be readily calculated". In an earlier report by the Commission, it was stated that a basic prerequisite for increasing productivity is an expanding economy with maximum employment and maximum utilization of plants and machines. In the absence of such expansion, there is lagging productivity and under-employment (National Commission on Productivity, 1972).

While a healthy economy is a prerequisite for increased productivity, the concern over increased costs for governmental services has led to freezes on employment, and in Rhode Island, a freeze on all public employee salaries for one year. In cities like New York, these policies are insufficient, so demands for employee cuts are heard but unheeded. Since employment is already high, is it any wonder that employees see the cry for productivity as a management ploy to provide the same amount of work with fewer people?

If the economists are to be believed, the dilemma in education can only become worse. William Baumol of the Department of Economics at Princeton University states:

For a while in the progressive sector productivity increases will serve as an offset to rising wages, this offset must be smaller in the non-progressive sectors (education). Thus, the very progress of the technologically progressive sector inevitably adds to the cost of the technologically changing sectors of the economy, unless somehow the labor markets in these areas can be sealed off and wages held absolutely constant, a most unlikely possibility. This suggests, as productivity in the remainder of the economy continues to increase, costs of running the educational organizations will mount correspondingly, so whatever the magnitude of the funds they need today we can be reasonably certain that they will require more tomorrow and even more the day after that (Fleishman Report, 1973).

Thus, labor costs in education and other areas of governmental service increase as a result of increased wages in the progressive (industrial) sector. Unfortunately, this increase in labor costs reflects salary raises

and is not related to an increase in productivity. An example of this dilemma is demonstrated in military expenditures. The increased cost of labor for an infantry rifleman is more a reflection of the increased labor costs in a volunteer army than it is an increase in productivity.

## Productivity

### Economic Models

Productivity in its simplest definition is simply real output per hour of work. This definition serves as a measure of the effectiveness with which labor is utilized. With this definition, it is easy to see why increased wages are tied to increases in productivity. If all production costs, except labor, are held constant, and production of units per hour is increased, then wages per hour can be increased at a rate equal to the increased rate of productivity, yet maintain the same per unit cost. Unfortunately, at a time when other production costs (cost of borrowing capital, cost of energy, cost of raw materials) are constantly increasing, then productivity must increase to simply maintain the same per unit cost even if wages are constant. This definition focuses upon quantity of goods produced per unit cost. While this simple definition does not appear to reflect a quality measure, the per unit price the consumer is willing to pay is in fact an indication of the quality of the goods or services. The concern for increased productivity is obvious. Without increases in productivity, the costs of goods and services will continue to rise, for the per unit cost of the items rises as a function of the labor costs rather than an increase in quality. This increase is one definition of inflation.

In the areas of manufacturing, units of output tend to be more easily measured than in the service sector. The number of completed cars, dresses, guns, books are easily counted. Without a directly quantifiable factor, as in the provision of services, substitute indicators are sought. In education it is common to use an indicator such as student contact-hours

to serve as a measure of productivity. A student contact-hour would be one student having direct contact with a teacher for one hour for the purpose of instruction. The more students contacted per unit of labor cost, the higher the rate of productivity. In this case, the unit of productivity is not directly related to a unit of identifiable output, instead it is related to units of activity or service provided. This level of activity is expected to have some inherent worth. Other substitute indicators of educational "products" are marginal increases in student skills, or number of jobs created or filled as a result of a program. If the only purpose of schools were to dispense knowledge or provide training in skills, the assessment of output would be difficult. One could count the number of students enrolled in school or the number of hours of teaching provided, but assessment of the results of these two joint activities would be more difficult. If instead, as Boulding (1972) notes, there are more frequent but less noted services provided--such as custodial service or "child sitting"; certification of teachers; and community activities such as concerts, plays, sports, and adult education--then the measurement of output is somewhat easier. "Body counts" such as enrollments, graduates, attendance, are all output indicators from these services. Unfortunately, education is expected to meet all of these expectations on approximately the same level of priority.

In applying the tools of economic analysis of the educational process, it is expected that a careful analysis will permit the selection of the appropriate mathematical model, permitting the identification of the optimal blend of goods and services to optimize the teaching/learning situation (Lukitsh and Sesskin, 1973). In industry, production functions have been relatively well defined and saddle points identified. In education,

much has yet to be learned about these functions in relation to the learning process.

Elementary economics reminds us that production functions tend to appear as an S shaped curve. With such a curve, one can knowledgeably predict the likely return for any given amount of invested resources.

To increase productivity, one hopes to change the shape or position of the production curve on the graph, the intended result being to increase the results (learning, number of opportunities, experience) for the given amount of investment. Three possible strategies for such a change are:

1. Increases in efficiency
2. Changes in the mix of services
3. Changes in the kinds of clients

Since education is presently a labor-intensive industry, increases in efficiency might come from workers (teachers) working faster or differently. Another approach is to provide training and resources for the staff so as to make them more efficient and productive. Both of these approaches require increased costs. To simply demand more work for no increases in rewards is likely to require an increase in supervision costs. The second approach requires investments in training as well as released time for the training to take place; with most contracts, more salary is paid to employees with advanced training, thus the increases in productivity would have to be great enough to offset the increased costs due to the increased training. One could also seek increases in efficiency through a heavier emphasis on capital investment for equipment and/or differentiated staffs to increase productivity. Both approaches would likely involve large start-up costs and it would be some time before benefits might be realized. Presently, school systems are trying to keep budget increases less than or equal to inflationary costs. No new monies

are present. Without adequate finances to meet present obligations, it is unlikely that districts will invest large expenditures for expected long term gains.

To bring about a change in service mixes, one should first be apprised of the relative effectiveness of the existing blend of services and the options available for change. While the research provides some answers as to the relative worth of a large group vs. small group instruction, reading program A vs. reading program B, as well as other kinds of services, for the most part, cost benefit estimates are not available for entire systems.

P.P.B.S. offers an option for districts to view their range of services on a program basis and consider budgeting on that basis rather than considering services only as separate items on the budget. Unfortunately, educational services, like other governmental services, appear to have a parkensonian desire to grow and almost never have a desire to shrink. With the present decision-making capability, changes in services mixes are unlikely. To achieve a change in clients would likely require that the school consider not serving those clients who require an inordinate amount of resources. Presently, these are exactly the clients that schools are required and subsidized to serve. Additional monies are made available to districts to serve the students who are most difficult to serve.

A more disheartening observation is that offered by Boulding. He suggests that educators receive their incomes mainly from the by-products of education--custodial care and certification (Boulding, 1972). If an educator is successful in becoming a more productive teacher, the expected reward is usually not monetary; but rather to become an administrator,

a master teacher, or have some other responsibility resulting in a reduced commitment to teaching.

### Research in Management Science

The nature of man has long served as a topic of inquiry. Since increased productivity has, for a long time, been a function of increases in labor productivity, investigations of the relationship between the individual, the organization, and the interaction's impact upon productivity has been interesting. The impact of Frederick Taylor's concept of scientific management is frequently considered to be the first effort to study man's work scientifically and relate that work process to output. Mayo and the others who conducted the Hawthorne experiment, found that the quality and quantity of attention focused on employee needs are more determinant of productivity than the physical variables of the workplace. The studies of Lewing, Lippit, and White indicated that a conscious manipulation of the authority structure within a group can affect the group's behavior and output. Douglas McGregor's theories X and Y offer explanations of the nature of man which provide clear challenges to administrators. If the manager accepts McGregor's premise, the manager is challenged to create conditions which permit members of an organization to achieve their personal goals while also completing those of the organization. While McGregor realized that a perfect match was not likely, the closer the match, the greater the productivity. Blake & Mouton developed models to describe various managerial styles. Likert's work corroborated that of Blake and earlier social scientists. Their findings included, among other things, that:

1. Integration of individual needs for affiliation and self-expression with the organization's goal to produce is possible to a greater degree than thought possible.
2. Organizations with a high degree of integration produce more.

Argyris argues similarly that managers have an enormous impact on their subordinates' growth or lack of growth. Yet typical organizational structures inhibit such growth. The managerial principles of chain of command and span of control clearly permit the top manager to experience more control of self and environment than their subordinates.

Morse and Lorsch (Luke, 1975) conclude from their studies that, despite the awareness of the organization's impact upon the individual, there is no one best model of organizational structure. Repetitive work might best be done in a traditional structure, while more abstract conceptual work might require great individual autonomy. A successful model must account for the workers and their idiosyncratic needs. In the companies studied, it was found that individual competence, motivation, and productivity were more a function of the degree of integration than organizational structure. Herzberg's studies (1966) of variables affecting job satisfaction and morale are those frequently requiring a minimal increase in expenditure. These variables were the intrinsic aspects of the job (achievement, recognition, the work itself, responsibility and advancement); Negative variables were extrinsic to the task (interpersonal relations, supervision, company policy, working conditions, possibility for growth, personal life, job security and salary). The implementation of this knowledge to the world of work has been the concern of organizations and leadership theorists for sometime. One of the current labels for this

effort is organizational development or OD. Hackman (1975) suggests that job enrichment is the darling of the mid 70's and suggests do's and don't's for the process. Since there is a dearth of evaluative data on job enrichment strategies, more needs to be known before it is adopted on a wholesale basis.

#### National Commission on Productivity

The National Commission of Productivity was created by President Nixon in June 1970. With the new Phase I, II and III economic policies and related wage and price ceilings, the role of the Commission was broadened to assist in the design of the post-freeze economic stabilization program and to serve as consultant to the Cost of Living Council. The Commission was further directed to organize regional and local councils, expand their research program, and develop a stronger program to foster public understanding of productivity growth (N.C.O.P., March, 1972). In addition to commissioning research efforts, the Commission identified six areas for future investigation.

1. Productivity bargaining
2. Strengthening of manpower adjustment policies
3. Education, research, and development
4. Improvement of productivity of government
5. Assessing the extent to which institutions have an adequate supply of capital for future growth
6. Identifying industries with lagging productivity growth and identifying practical measures for their improvement

## Productivity Research in Education

### Efforts at the LEA Level

On local educational levels, efforts to increase academic productivity have been serious, but results are mixed. Performance contracting, performance-based teacher-education, use of paraprofessionals, CMI, and cost-benefit analysis are a few of the efforts attempted at the classroom level, but teacher opposition and inadequate implementation has often frustrated these efforts. Some bases for the teacher opposition were mentioned earlier. One additional factor of concern is the use of standardized achievement tests as the device for measuring productivity. Although standardized tests reduce the temptation of teachers to lower standards to insure higher productivity, they still have shortcomings which reduce their utility. These tests tend to be less sensitive to curricula designed for particular community needs. Teachers also feel that when schools focus upon changes in test scores as measures of "efficiency and productivity", the institution commences to have little concern for less tangible but equally important goals (citizenship, values). A final criticism is that school regimentation tends to result in rigidity of methods (House, p. 66). One possible solution to this opposition has been to incorporate productivity on a systemwide basis rather than the classroom level. Kalamazoo, Michigan, has a public school board which designed an employee evaluation and accountability system that "rewards excellence and stifles mediocrity". (Jones, p. 32). The most unusual feature is the superintendent's contract which stipulates that his pay be based upon a sliding scale depending entirely upon his performance, and his school system's productivity. Similarly, in the Lawndale school district in California, the school board

began a system of performance-based productivity at the top. "The superintendent's willingness to be held accountable will very soon reflect itself in its benefits to the district" (Ricketts, p. 70) as he is able to focus his attention more on action rather than reaction. It has been found that as the top levels begin to exhibit the advantages of productivity, teacher personnel and administrative persons better accept the system for themselves. Better communication has been exhibited on all levels. Students have been treated, contrary to belief, as human beings; performance has been measured not only by achievement tests, but also by teacher checklists, observation and criterion-referenced tests.

#### Efforts at the SEA Level

State educational associations have become concerned in recent years as to how funds may be most efficiently and effectively allocated so that productivity in their local school districts might increase. (Buckmiller 1974, 1975). They have found strong evidence of public support of educational expenditures when funds are productively utilized, when the community is involved in the planning process, and when the communications line is kept open on the progress and objectives of a state's school administrators (Moore, p. 24). Many state-level associations have studied ways in which to improve productivity but few have implemented any state-wide programs. Due to the increase in public costs in education, Governor A. A. Moore, Jr., of West Virginia, developed a task force designed to study the implementation of more efficient methods and procedures in local public-education. Their report included 118 recommendations that could produce more efficient schools in all aspects. By making the

education dollars go farther, the tax burden on the citizen is relieved. A different approach was utilized in Michigan where state-wide educational goals were identified and evaluated. Evaluation was on the level of assessing individual student performance and overall program-effectiveness. The ultimate performance objective on the state level is to provide the student with the minimum skills necessary to take full advantage of the adult choices available to him.

Perhaps the most exhaustive effort to review educational policies and their impact upon a state is contained in the three volumes of the Fleischmann Report, issued in 1972. One conclusion was that better performance in the schools can be obtained with no increase in cost by changing the recruitment, training, salary structure, certification procedures, job assignment, and working conditions of school personnel. Some recommendations for change include:

1. A licensing and salary structure to establish four categories of teachers. Master Teachers (the top level) comprise approximately 10% of the staff at a salary comparable to the principal.
2. Lighthouse schools be established to provide training centers for intern and apprentice teachers and provide opportunities for applied research.
3. At least 90% of the supervisory staff should assume classroom teaching responsibility equivalent to 1/5 of the work load.
4. Move toward state-wide collective bargaining.
5. Establish a single state-wide pension plan.

6. Greater specialization of teachers with an increased use of paraprofessionals.
7. Greater use of television.

### Efforts in Higher Education

Productivity in higher education is much more difficult to ascertain due to the existence of the wide variety of services provided by an individual institution. Educational productivity on the post-secondary level must not only concern itself with the institution's academic service but also with research and public services (Bowen, p. 194). Dr. B. J. Priest, Chancellor for the Dallas County Community College District, has proposed for the coming 1975/76 school year a 5% increase in productivity of his operation. He does not, however, attempt to describe how this may be done. He feels that asking for "this proposed 5% increase in productivity is not asking anything extraordinary." (B. J. Priest, p. 20). This can be accomplished, he explains further, because manufacturing and industry have had a 3% increase per year and agriculture a 5% increase or more.

Maintaining quality is the major factor with which higher education is concerned in the search for optimal efficiency and productivity, and it should not be forsaken. What Dallas County proposed in order to maintain quality is that pay salaries be dependent upon the specified increase in productivity as well as maintenance of quality. Many feel, as W. W. Wortman does, that "the difference in productivity between educational institutions and commercial enterprises has contributed to the increasing cost of government (education), as members of the teaching profession try to maintain their relative income position while productivity virtually stands still." (Wortman, p. 23) On this basis, Nassau Community

College instituted a cost-analysis system which decreased cost input while at the same time increased its productivity output. This was accomplished through an in-depth analysis by the college computer center. Through this analysis of past performance, the college community could more efficiently plan for the future (Lukitch & Sesskin, p. 26-27). Though higher institutions have always had to defend their budgets, lack of faith in the Establishment, economic insecurity, and lowered priorities for higher education (Henry, p. 288) have made it quite necessary for post-secondary institutions to incorporate massive self-examination procedures. Even though productive outcomes are less apparent in the short term period, efforts must be enumerated so as to win the support of the cost-conscious public.

Efforts by the Western Interstate Commission on Higher Education and the National Center for Higher Education Management Systems have resulted in computer models such as the Resource Requirements Prediction Model (RRPM). These models and the associated standardization of definitions and terms have provided some assistance in developing a common measure for IHE productivity. As work progresses, better measures of productivity and better measures of the relationships between costs and output are likely.

#### New Directions for Research

The pessimistic tone of the paper is not indicative of my hopes for the future. I would like to suggest at least seven areas in which additional research should prove fruitful.

One of the first areas in need of consideration is the definition of productivity itself. The identification of productivity indicators is the

first step toward better knowledge of the educational production function. A perusal of the bibliographic material in this paper reflects how little has changed over time. For example, in 1913, at the NEA proceedings, Dr. Frank Spaulding, a superintendent of schools in Newton, Massachusetts, had the following observations:

I know of no single adequate measure of the efficiency of a school either relative or absolute. Some index or measure which could be used is the percentage of children of each year of age in the school district that the school enrolls; the average number of days attendance secured annually from each child; the percentage of the children of each age who are able to complete their schooling . . . . (Callahan, 1962, p. 69)

The concern for adequate measures still exists. The measures proposed by Spaulding, despite their inadequacy, still remain today as partial indicators of efficiency or productivity. The teacher-effectiveness formula proposed by Kauffman, et. al (1973) represents one new approach. More are needed.

A second focus of future research is the area of program definition. While the current emphasis on the establishment of objectives for schools and programs, the use of criterion referenced tests, and other similar efforts toward the identification and quantification of outputs is a positive step toward the establishment of a definition of quality education, this is not enough. I am reminded of Callahan's notes regarding a 1912 editorial by Cubberly, the Dean of the School of Education at Stanford. Cubberly suggested that with the adoption of scientific management:

. . . pupils would be carefully examined and properly classified and they would chart their progress and see their deficiencies. Teachers would know what was expected of them and principals and supervisors could tell at a glance whether pupils or rooms are making proper progress.

It seems that the system approach and a desire for a MIS was alive over sixty years ago. While the need for the systematic establishment of instructional goals was identified, little regular progress has been made until now. Continued efforts will permit better measures of productivity. Research will be needed to identify the relationships between activities and output:

A third concern might by itself serve to increase productivity as a natural by-product of its original intent. I am suggesting the adoption of a more efficient record-keeping system. Most, if not all, of the present teaching systems require large amounts of reliable, systematic record-keeping. Sound research and evaluation require similar amounts. Yet, for the most part, school record-keeping is performed by teachers and principals with paper and pencil. Annotated records are written by hand. With few exceptions, uses of dictation equipment, data processing equipment, photocopiers, and other labor-saving devices are seldom seen below the top management levels of school operations. Without better record-keeping, new and/or reliable measures are difficult to secure.

A fourth concern is the teaching process itself. The work of Eaton Conant and his study of Teacher and Paraprofessional Productivity (1973) offers some illuminating insights into the teaching activity. His findings were based upon a full day of observation of twenty teachers in a conventional classroom setting and twenty-seven teachers in a classroom utilizing a paraprofessional. One purpose of the study was to observe the teaching act, and categorize the activities into minutes of "instruction, routine, non-learning, other, and out of classroom". The findings indicated that in a conventional classroom, on the average, 92.04 minutes of a 5 1/2 hour school day was spent on instruction. This can be contrasted with

109.29 minutes in a classroom with a paraprofessional. Among his conclusions, he states:

It is clear that teachers who worked with paraprofessionals did not achieve a greater specialization in instruction and related professional tasks . . . In almost all respects, their work results were quite comparable with the work of their peers who worked without the assistance of paraprofessionals. (p. 62)

For the research personnel who carried out the study, the most surprising general finding remains that teachers were still able to instruct for only a relatively small portion of the total class day . . . These study results for teachers imply that teacher work roles will have to be significantly changed if the division of labor is to be redesigned to achieve more professional work. (p. 63)

If there is one recommendation that emerges clearly for practical implementation from the work study, it is that school experiment more with staff assignment plans that place paraprofessionals full-time in the homeroom role while teachers function as full-time instructors who visit classes during the day primarily to teach. (p. 64)

Aside from his findings, his development of a standardized system for analyzing work is useful. With it, the teaching act can be observed and adequate information gathered for the sake of restructuring it. Without a better understanding of the teaching act, as it presently exists, suggestions for greater utilization of paraprofessionals and/or some other type of teacher replacement will be less than successful.

A fifth direction relates to the issue of employee motivation. If, as Hackman suggests, job enrichment is the darling of the mid 70's because of its potential for more satisfied workers and consequent increased productivity, educational institutions will have to consider their adoption and implement thorough evaluation schemes. Since this will require time, our present efforts could be focused upon industrial methods, and the evaluation of those methods as they apply to education. While literature highlights studies which have investigated relationships between leader-

ship behavior and/or organizational climate, decision making, job satisfaction, and other concerns, less is known about successful strategies to change the climate or leader behavior. Hackman (1975) states that little more is known about successful strategies to implement job-enrichment programs. More must be known before adoption can be considered on a wide spread basis.

A sixth concern is for investigations of successful strategies to implement innovative practices. Pincus (1974) notes with some pessimism:

How would we expect a self-perpetuating bureaucracy to respond to R & D findings if (1) it is not market-oriented; (2) it is widely considered to be socially necessary and therefore deserving of public protection--is, in fact, the captive-servant of a captive clientele; (3) it is open to a good deal of public scrutiny on issues having to do with perceived equity, quality, and goals; (4) it cannot unambiguously define its aims or clearly identify technologies that are dominant in light of aims that might be specified; (5) its contribution to its clientele's life and learning is uncertain and also modest as compared to other societal influences; (6) its governance is highly decentralized, yet subject to a wide variety of influences, so that each unit perceives itself as facing a unique configuration of clients and masters? (p. 115)

He further notes that unlike a competitive firm, a school system should be expected to:

- A. Be more likely than the competitive firm to adopt cost-raising innovations, since there is no marketplace to test the value of the innovation (e.g., smaller class size) in relation to its cost.
- B. Be less likely than the competitive firm to adopt cost-reducing innovations, unless the funds so saved become available for other purposes within the district.
- C. Be less likely than the competitive firm to adopt innovations that significantly change the resource mix (e.g., a higher ratio of teacher aides to teachers, sharply increased use of capital-intensive technologies), because any consequent productivity increases are not necessarily matched by greater "profits" to the district, and because any replacement of labor by capital may threaten the guild structure of the schools.

- D. Be more likely than the competitive firm to adopt new instructional processes or new wrinkles in administrative management that do not significantly change institutional structure.
- E. Be less likely than the competitive firm to adopt innovations that change in accustomed authority roles and established ways of doing business, because changes in these relations represent the heaviest kind of real cost to bureaucracies.
- F. Be equally unwilling as competitive firms to face large-scale encroachments on protected markets (voucher systems, metropolitan-areawide open enrollment), although for somewhat different reasons. (pp. 117, 118)

His review of the research in this area identifies three factors favorable to innovation in the school:

1. Bureaucratic Safety - When the innovation is perceived as favorable with respect to the current status and organization of the bureaucracy (because in a self-perpetuating non-market system, these bureaucratic values become socialized and tend to dominate other criteria; or in other words, the bureaucratic costs are the real costs of the system).
2. Response to External Pressure - When external pressures for innovation are perceived as irresistible (because school systems cannot be entirely unresponsive to external pressures and financial constraints).
3. Approval of Peer Elites - When key figures in the bureaucracy and their colleagues in other educational bureaucracies can agree about the acceptability of the innovation (because in the absence of clearly defined output criteria, consensus among the elite is often the primary decision-making criterion). (p. 120)

He concludes with recommendations which merit our consideration.

1. More large scale experiments are necessary to demonstrate that they can or cannot work in a variety of settings.
2. Since the evidence indicates that administrators rely on personal contact for R & D information, R & D must be more closely tied with administrators and representatives of teacher organizations from the beginning. In addition, more seminars, etc. need to be offered at a time and in a manner in which all can attend.

3. More case studies are necessary to identify the implementation process.
4. More must be known of the incentive patterns which encourage adoption.
5. New incentive systems may have to be developed.

These recommendations are all based upon his fundamental conclusion that:

If goals are in some sense undefinable it is inappropriate to adopt the standard rationalist approach of first defining goals . . . . Instead R & D strategy should be based at least in part on the converse approach. (p. 129)

A final suggestion concerns itself with the roles of professional organizations in education including those involved in collective bargaining.

Teacher organizations need to take a more active part in the development of strategies for the improvement of education. As long as the research is carried out primarily by universities and research establishments for teachers, instead of with teachers, it is likely to continue to receive the lukewarm reception it has received in the past. This imposition of new methods from outside with insistence from above is likely to continue to be perceived as a contrivance of management to exploit the already oppressed teacher. Involvement of the teacher requires more than an obligatory single planning-period per week. It is time to persuade teacher's organizations to bargain for the adoption of educational programs along with salary increases. In addition, given the increasing number of school strikes, research is needed to identify successful political strategies capable of resolving legitimate differences of opinion without resorting to strikes.

By the year 2,000, despite any or all of these efforts, education may yet be no further in its understanding of the teaching-learning process and in its search for increased productivity. Issues seem to gain in complexity even as new discoveries are made. A quote, attributed to Robert Stake, is offered as a concluding observation.

A century ago, a Swiss historian, Jacob Burckhardt, foresaw that ours would be the age of the great simplifiers, and that the essence of tyranny was the denial of complexity. He was right. This is the single greatest temptation of the time. It is the greatest corrupter and must be resisted with purpose and with energy. (Lessinger and Kyler, 1971, p. 62)

In our search for increased productivity, I would hope that we don't ignore the complexity of the issue.

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