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ABSTRACT

This paper considers the total-quality-management teachings of W. E. Deming as a basis for the redesign of educational-administration preparation programs. The performance domains developed by the National Commission for the Principalship (jointly sponsored by the National Association of Secondary School Principals and the National Association of Elementary School Principals) provide the framework for discussing Deming's theory. The commission criticized educational-administration programs as inadequate and called for the design of new programs. The paper describes the following domains that should be included in administrator-education programs: leadership, information collection and usage, staff development, and motivation. Deming's Fourteen Points, the concept of profound knowledge, the attributes of a leader, the Plan-Do-Study-Act cycle for improvement, and control charts are discussed. Two tables are included. The appendix contains a list of performance domains as defined by the commission. A list of the performance domains of the National Commission for the Principalship is appended. Contains 11 references. (Author/LMI)

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The Teachings of Dr. W. E. Deming and the
Performance Domains of the National Commission for the Principalship
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A paper presented at the annual convention of
the University Council for Educational Administration
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Abstract

The purpose of the paper was to stimulate consideration of Deming's teachings as a basis for redesign of educational administration preparation programs. The performance domains developed by the National Commission for the Principalship were used as a framework for discussion of the Deming theory. The commission criticized educational administration programs as inadequate and called for new programs to be designed. These domains or domain clusters were used: leadership, information collection and usage, staff development, and motivating others. The 14 points, profound knowledge, attributes of a leader, the Plan-Do-Study-Act cycle, and control charts were discussed.

The Teachings of Dr. W. E. Deming and the
Performance Domains of the National Commission for the Principalship

Many school administrators can attest that they have been "working harder and smarter" to the limits of their knowledge and energy. In spite of the substantial efforts of principals and superintendents; however, dissatisfaction with public schooling in the United States continues to mount. Meanwhile, despite assertions such as that made by Drake & Roe (1986) that "the major task of the principal is to provide educational leadership to improve learning" (p. 151), improvement has generally not been demonstrated. A partial explanation may be found in a report from Boyd & Crowson (1981) that the efforts of school administrators appeared to be directed largely toward system maintenance rather than toward the improvement of instruction. Many other explanations for the lack of improvement could be offered. An alternative which holds particular interest for professors of educational administration is that practitioners have not acquired the knowledge needed for school improvement from their preparation programs.

The National Association of Secondary School Principals and the National Association of Elementary School Principals jointly sponsored the National Commission for the Principalship as an effort to improve the preparation of principals. The impetus for this initiative came from the realization that earlier programs have not prepared school administrators for the change they are confronted with in the economic, demographic, and technological spheres. The commission found that "...principals need increasingly to take initiatives. They must understand change as well as manage change" (National Commission for the Principalship, 1990, p. 11). The commission concluded that "earlier theory-based constructs [of preparation] have become largely obsolescent" (p. 1) and called for new programs to be designed.

Traditional preparation programs for school administrators seem to have been designed as an answer to this question: What knowledge, skills, attitudes, and values do principals and superintendents need to *operate* school buildings and school systems? Given the changing conditions noted by the commission, perhaps a different question should be asked today, namely: What knowledge, skills, attitudes, and values are needed to *pursue continuous improvement* in school buildings and school systems?

W. E. Deming has been seeking to provide an answer to a more general form of the second question over most of his long and distinguished life. His career includes study with notables such as Sir Ronald Fisher; eminence as a statistician in his own right; travel to occupied Japan in 1950, where he was instrumental in helping the Japanese revitalize their war-ravaged production capability; and eventual recognition in America for his thinking on quality. His teachings were broadly adopted by the Japanese and are believed to be a key factor in their economic resurgence over the last 40 years. Since about 1980 his teachings, along with those of other quality gurus such as Juran, Feigenbaum, and Crosby, have been embraced by businesses, hospitals, governmental agencies, and in the past few years, by public schools.

It would be difficult to find a more acerbic critic of American management practices than Deming. He has indicted American management practices as unfit for export, "Export anything to a friendly country, except American management" (Dobyns & Crawford-Mason, 1991) and has insisted that American management practices "must be blasted out" (Deming, 1986a, p.1). Deming offered his new theory of management to take the place of traditional American management practices (Deming, 1986b). His best-known formulation of the theory is in 14 succinct points (shown at Table 1). He also described his theory as a system of profound

knowledge, or knowledge for improvement. Deming's system of profound knowledge is made up of four overlapping areas: systems, variation, knowledge, and psychology.

Table 1, Fourteen Points of W. E. Deming

1. Create constancy of purpose for the improvement of product or service.
 2. Adopt the new philosophy.
 3. Cease dependence on inspection to achieve quality.
 4. End the practice of awarding business on the basis of price tag alone.
 5. Improve constantly and forever every process for planning, production, and service.
 6. Institute training on the job.
 7. Adopt and institute leadership.
 8. Drive out fear.
 9. Break down barriers between staff areas.
 10. Eliminate slogans, exhortations, and targets for the work force.
 11. Eliminate numerical quotas for the work force and numerical goals for management.
 12. Remove barriers that rob people of pride of workmanship.
Eliminate the annual rating or merit system.
 13. Institute a vigorous program of education and self-improvement for everyone.
 14. Put everybody in the company to work to accomplish the transformation.
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The purpose of this paper is to stimulate the consideration of Deming's teachings as a

basis for a new design for preparing educational administrators. Selected domains of the principalship as identified by the National Commission for the Principalship will be used as a framework for discussion of elements of his teachings. The National Commission for the Principalship developed 21 performance domains for the principalship (Appendix A) through a carefully designed process which included a task analysis of the principalship, focus groups of school administrators, use of a conceptual model for the principalship, involvement of industrial psychologists, and two reviews by a distinguished jury. Similarities and differences between the relevant Deming elements and the domain elements will be described.

The domains were reviewed to identify those that could be closely associated with the Deming theory of management. The organizational oversight, delegation, student guidance, sensitivity, oral expression, written expression, philosophical and cultural values, legal and regulatory applications, policy and political influence, and public and media relationships domains were not included in the discussion. The remaining 11 domains were organized into four sections as follows: (1) leadership; (2) information collection and usage: information collection, problem analysis, judgement, measurement and evaluation, resource allocation, instructional program, and curriculum design; (3) staff development; and (4) motivating others.

Leadership

Perhaps the greatest relationship between Deming's teachings and the performance domains concerns leadership. The commission saw leadership as an overarching phenomenon that shaped the school, and made an effort to differentiate this broad conception of leadership and the domain of functional leadership. The narrower leadership domain "centers upon moving groups to accomplish tasks" while the broader concept concerns "shap[ing] the instructional

climate, lift[ing] aspirations, and reduc[ing] environmental constraints" (National Commission for the Principalship, p. 21).

The breadth of Deming's concept of leadership extends as far as the commission's. He characterized his entire work as a theory of leadership. A requirement for the "transformation of Western style of management" is "that managers be leaders" (1986b, p. 54) and he contended that nearly all of his landmark *Out of the Crisis* was about leadership: "Nearly every page... states a principle of good leadership... or shows an example of good or bad leadership" (p. 248). The conceptions differ, however, in that the Deming view of leadership is one in which the cognition and behavior of the leader is driven by an understanding of profound knowledge. The attributes of a leader, according to Deming (1991) are shown in Table 2.

Table 2, Attributes of a Leader

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1. They understand how the work of their group fits in to the aims of the company.
 2. They work with preceding stages and with following stages.
 3. They try to create for everybody joy in work. They try to optimize the education, skills, and abilities of everyone, and help everyone to improve.
 4. They are coaches and counsellors, not judges.
 5. They use figures to help them understand their people and themselves. They understand variation. They use statistical calculation to learn who if anybody is outside the system, in need of special help.
 6. They work to improve the system that they and their people work in.
 7. They create trust.
 8. They do not expect perfection.
 9. They listen and learn.
-

In Deming's broad notion of leadership, a more general aim accompanies and supports the goals derived from the needs of the customer: constancy of purpose (the first of the 14 points). Constancy of purpose means a focus on problems of the future (rather than a myopic

fixation on today's problems) by allocating resources for long-term planning, research, education, and constantly improving the design of service. The link between customer needs and constancy of purpose lies in striving to satisfy and delight the customer over time so that the organization can continue to thrive.

Several additional concepts that have correspondence to Deming's work are suggested in the leadership domain: formulating goals, setting priorities, and student and staff needs. The needs of the students and staff, as seen from the quality perspective, are the starting point of quality improvement. Deming described improvement efforts as "aimed at the needs of the consumer, present and future" (1986b, p. 5).

Taking the systems point-of-view carries the idea of customers and needs yet further. While the needs of external customers (the consumer) are of paramount importance to everyone within the organization, every work process has a customer and a supplier, whether internal to the organization or external. Examples from education may clarify how the school system is made up of many sub-processes, all contributing to the broader goals of the school. When the process is second grade education, the third grade teacher is the customer and the second grade teacher is the supplier. When the principal of the junior high school submits a work order for repair of the bathroom partitions, the principal is the customer, and the Director of Buildings and Grounds is the supplier.

The Plan-Do-Study-Act (PDSA) improvement cycle, sometimes referred to as the Deming cycle, is closely related to the two remaining leadership domain elements: integrating ideas for task accomplishment and initiating and planning organizational change. The PDSA cycle is a model for designing experiments so that ideas for innovation and improvement can be

tested on a small scale. The PDSA cycle will be described in greater detail in the next section.

Information Collection and Usage

The domains included here concern collecting and using information for analyzing problems, making judgements, allocating resources, implementation, measurement and evaluation, instructional programs, and curriculum design. The last two domains are included in this section because the improvement of instruction and curriculum relies heavily upon information collection and usage.

The seven domains gathered in this section are important to the commission, as they represent one-third of the performance domains for the principalship. The elements found in these domains are not new to educational administration; in fact, many of them, although not all, are included in the typical preparation program. The elements in the Deming philosophy associated with this section are also important; however, one of the greatest points of difference between the content of the domains and the Deming's teachings is also found in this section. The nature of the difference is the key to understanding Deming's teachings on leadership and improvement.

Improvement depends on information from both the process and the customer. Point five of the fourteen points, "Improve constantly and forever every process for planning, production, and service" is accomplished by gathering information from the cause system which creates the results. This information leads to understanding that can be used to improve the system.

Concepts from the implementation domain such as planning, action, alternative approaches, actual and intended outcomes, and adapting to new conditions all have high correspondence with the PDSA cycle. Information on customer needs and the performance of

the process must be collected in order to begin the PDSA cycle. The difference between needs and performance is a gap that represents an opportunity for improvement (Sherkenbach, 1990).

Briefly, the PDSA cycle is composed of four quadrants:

- Plan. Recognition of the gap leads to a theory (hunch or something more elaborate) for reducing the gap. A plan is developed for testing the theory for improvement.
- Do. The test is carried out.
- Study. The results are studied (perhaps using statistics).
- Act. If the plan reduced the gap, the plan is implemented on a broad scale; otherwise, an alternative theory must be developed and a plan for testing it (another cycle through the PDSA).

The PDSA cycle is important in Deming's teachings because it serves as a vehicle for action science. It is used to test theory. The cycle allows the development of knowledge based on theory and prediction. One of the four areas of Deming's system of profound knowledge concerns a theory of knowledge. In Deming's view, without prediction there can be no management.

The concept of prediction, which is derived from the theory of knowledge, and the theory of psychology lead Deming to insist that grades for schoolwork should be eliminated. Grades are extrinsic motivators (and therefore damaging to dignity and self-esteem) and can not be used to predict: "Our educational system would be improved immeasurably by abolishment of grading" (Deming, 1991, p. 24).

Most of the opportunities for improvement of a stable system, Deming advises, come from altering the system itself, which is primarily the job of management, not those who work

within that system. This means the principal or the building steering team, not the teacher, has a greater responsibility for improving the building system. This means that the teacher, not the students, has a greater responsibility for improving the classroom system.

A third area of profound knowledge which relates to this section, particularly to the judgement and measurement and evaluation domains is concerned with statistical theory. Statistics that are used in the Deming approach differ from the inferential statistics encountered by most graduate students in education. The most useful aspect of Deming's considerable statistical background concerns variation. Deming (1986b) places little value on statistics used for what he describes as enumerative studies: "Analysis of variance, t-tests, confidence intervals, and other statistical techniques taught in the books, however interesting, are inappropriate because they provide no basis for prediction and because they bury the information contained in the order of production" (p. 132).

In 1924 Walter Shewhart, Deming's friend and mentor, developed a statistical tool for plotting the performance of a process over time: the control chart. The control chart is a record of process variability. It is used to identify both controlled variability which is due to the process itself and uncontrolled variability from outside the process. Causes of the former variability are referred to as common causes, and causes of the latter type are called special causes. Special causes are usually corrected by the worker; common causes are usually corrected by management. Management action is required to improve a stable process. This means of analysis has rarely been used in schools but holds great promise for school administrators as an aid to reaching decisions and guiding their actions.

Improving the system is intended to narrow the amount of variation within it. For student

achievement, this means raising the mean of achievement while reducing the variation. From the Deming perspective, this is the primary task of school leadership.

Staff Development

This domain concerns professional needs, staff effectiveness, supervising, and initiating self-development. Point six stipulates that training must take place so that workers know their job. The implication is that the school administrator is responsible for seeing that each individual knows the tasks and functions that make up his or her job. The unique aspect of this point is that it includes understanding the work at preceding and following stages of the work flow. As an example in the school setting, not only must the teacher know and understand his or her job; but the principal, students, and parents should also understand the teacher's job. Anyone who provides inputs to the teacher, including other teachers and support personnel, or who receives outputs from the teacher should understand the teacher's job.

Point 13 is similar in wording and may appear redundant to point six; it is not. Although the last phrase, "initiating self-development" appears to have high correspondence, this point probably departs from the general meaning of the staff development domain. This point is premised on a belief that personal growth of the school staff will return benefits to the school. Deming's intent is that everyone be involved in a continuous program of learning and self-improvement. This increases their ability to contribute through improvement and innovation to the school, to the community, and to society.

Motivating Others

This domain introduces the concepts of commitment, participation, recognition and reward, and coaching and guidance. The National Commission for the Principalship (1990)

found that "Schools...must be team oriented" and principals should "...create collaborative action" (p. 9). The commission recognized the importance of trust: "Much depends on the level of trust in schools. Effective principals build and work at preserving high levels of trust among colleagues" (1990, pp. 13-14).

Indirectly, a high value is placed on trust by Deming. Point eight calls for the elimination of fear, a necessary action in most schools if higher levels of trust are to develop. Gibb (1978), the developer of the fear-trust theory, took a similar approach to establishing trust. He called for the removal of factors that produced fear and defensiveness. He identified ten management strategies or behaviors that contribute to fear: (1) role differentiation, (2) fear-escalation as a management tool, (3) covert strategies, (4) control of communicative processes, (5) manipulation of extrinsic rewards, (6) results orientation and focus upon efficiency and product, (7) control and rule systems, (8) manipulation of organizational structure, (9) segmented, linear, and "assembly line" orientation, and (10) overmanagement.

Joyce, Hersh, and McKibbin (1983) observed that "[School improvement efforts] have, in the past, proved difficult to implement and sustain" (p. 61). They identified a similar set of obstacles to the cooperative efforts needed to innovate in schools: the autonomy bestowed on individual teachers by the cellular model of the school, tacit agreements among teachers and administrators to respect territorial boundaries, informal sanctions, and social pressure in the form of disparagement of attempts at innovation.

Gibb's ten factors and Joyce, Hersh, and McKibbin's obstacles are similar to the obstacles Deming advocates eliminating in points eight through twelve. The barriers found in Deming's points are fear, internal organizational barriers, competition, exhortations, numerical quotas and

goals, annual evaluations, merit ratings, and grades. The barriers between people, grade levels, and subject areas found in schools interfere with commitment to a common purpose, even awareness of it. As a result, isolation and low trust are endemic in public education.

Fear and the associated low levels of trust prevent effective teams from developing. Deming states in point 14 that "Everyone can take part in a team." This suggests that everyone has something to contribute. The obstacles cited are preventing both teachers and administrators from feeling that they are part of a group that is working together. A principal operating from the Deming perspective would act to remove these barriers so that trust and teamwork could be developed.

Conclusion

Before redesigning of the preparation of school administrators, professors and other stakeholders may benefit from revisiting the design question; i.e., What should school administrators be prepared to do? Deming's conception of leadership is based on the key elements of continual improvement, constancy of purpose, and profound knowledge (Dobyns & Crawford-Mason, 1991). The processes of schooling are in need of a concerted, long-term improvement effort. School principals and superintendents are central to improvement. A redesigned educational administration program based on the Deming knowledge for improvement would result in school administrators being better prepared to respond to changes presently faced and those that lie ahead.

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Appendix A
Performance Domains of the National Commission for the Principals

Leadership: Formulating goals with individuals or groups; initiating and maintaining direction with groups and guiding them to the accomplishment of tasks; setting priorities for one's school in the context of community and district priorities and student and staff needs; integrating own and others' ideas for task accomplishment; initiating and planning organizational change.

Information Collection: Gather relevant data, facts, and impressions from a variety of sources; seeking knowledge about policies, mandates, and laws; managing the data flow; classifying and organizing information for use in decision making and monitoring

Problem Analysis: Identifying the important elements of a problem situation by analyzing relevant information; framing problems; identifying possible causes identifying additional needed information; framing and reframing possible solutions; exhibiting conceptual flexibility; assisting others to form reasoned opinions about problems and issues.

Judgement: Reaching logical conclusions and making high quality, timely decisions given the best available information.

Organizational Oversight: Planning and scheduling one's own and others' work so that resources are used appropriately, and short- and long-term priorities and goals are met; monitoring projects to meet deadlines.

Implementation: Making things happen; putting programs and plans into action; applying management technologies; applying methods of organizational change including collaborative processes; facilitating tasks; establishing progress checkpoints; considering alternative approaches; providing "mid-course" corrections when actual outcomes start to diverge from intended outcomes; adapting to new conditions.

Delegation: Assigning projects or tasks together with clear authority to accomplish them and responsibility for their timely and acceptable completion.

Instructional Program: Envisioning and enabling instructional and auxiliary programs for the improvement of teaching and learning; recognizing the developmental needs of students; insuring appropriate instructional methods; designing positive learning experiences; accommodating differences in cognition and achievement; mobilizing the participation of appropriate people or groups to develop these programs and to establish a positive learning environment.

Curriculum Design: Interpreting school district curricula; planning and implementing with staff a framework for instruction; initiating needs analyses and monitoring social and technological developments as they affect curriculum; responding to international content levels; adjusting content as needs and conditions change.

Student Guidance and Development: Providing for student guidance, counseling, and auxiliary services; utilizing community organizations; responding to family needs; enlisting the participation of appropriate people and groups to design and conduct these programs and to connect schooling with plans for adult life; planning for a comprehensive program of student activities.

Staff Development: Identifying with participants the professional needs of individuals and groups; planning and organizing programs to improve staff effectiveness; supervising individuals and groups; engaging staff and others to plan and participate in recruitment and development; initiating self-development.

Measurement and Evaluation: Determining what diagnostic information is needed about students, staff, and the school environment; examining the extent to which outcomes meet or exceed previously defined standards, goals, or priorities for individuals or groups; drawing inferences for program revisions; interpreting measurements or evaluations for others; relating programs to desired outcomes; developing equivalent measures of competence.

Resource Allocation

Planning and developing the budget with appropriate staff; seeking, allocating, and adjusting fiscal, human, and material resources; utilizing the physical plant; monitoring resource use and reporting results.

Motivating Others

Building commitment to a course of action; creating and channeling the energy of self and others; planning and encouraging participation; supporting innovation; recognizing and rewarding effective performance; providing coaching, guidance, or correction for performance that needs improvement; serving as a role model.

Sensitivity: Perceiving the needs and concerns of others; dealing with others tactfully; working with others in emotionally stressful situations or in conflict; managing conflict; obtaining feedback; recognizing multi-cultural sensibilities.

Oral Expression: Making oral presentations that are clear and easy to understand; clarifying and restating questions; responding, reviewing, and summarizing for groups; utilizing appropriate communicative aids; adapting for audiences.

Written Expression: Expressing ideas clearly in writing; writing appropriately for different audiences such as students, teachers, and parents; preparing brief memoranda.

Philosophical and Cultural Values: Acting with a reasoned understanding of the role of education in a democratic society and in accord with accepted ethical standards; recognizing philosophical and historical influences in education; reflecting an understanding of American culture, including current social and economic issues related to education; recognizing global influences on students and society.

Legal and Regulatory Applications: Acting in accordance with relevant laws, rules, and policies; recognizing governmental influences on education; working within local rules, procedures, and directives; administering contracts.

Policy and Political Influences: Identifying relationships between public policy and education; recognizing policy issues; examining and affecting policies individually and through professional and public groups; relating policy initiatives to the welfare of students; addressing ethical issues.

Public and Media Relationships

Developing common perceptions about school issues; interacting with parental and community opinion leaders; understanding and responding skillfully to the electronic and printed news media; initiating and reporting news through appropriate channels; enlisting public participation; recognizing and providing for market segments.