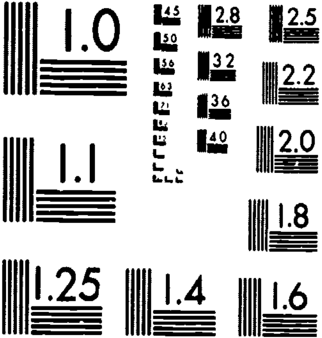

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ABSTRACT

This document is a discussion of a systemized approach to education theory and practice, especially as it applies to performance-based teacher education. The author uses as the basis of his discussion the physical sciences and their use of approximation models (an illustration of this use is the historical development of the description of matter through atomic theory). For teacher education, the author lists set, pacing, and closure as components comparable to the components of an atom for integral structure. A model is given, performance based, in which a highly effective orchestration of set, pacing, and closure will increase the probability of a greater number of positive teachable moments. Again, as with the atom, the author finds dynamic yet orderly and disciplined activity in performance-based teacher education, which moves in some direction and serves a generative function. Included is a description of the generation of performance-based teacher education from the early 1960s. The author completes his discussion by stressing the importance of formative evaluation procedures within a program as part of the generative function of performance-based teacher education. (JA)

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THE EVOLUTION OF PERFORMANCE BASED TEACHER EDUCATION PROGRAMS

by

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In their quest of operational theories of instruction, many educators have followed a pragmatic course in research and in teacher education rather than a deliberate and systematic approach. Consequently, education is a field strewn with bits and pieces of random data, like scattered sections of a jig-saw puzzle. What is expendable is the continued adherence to the either-or outlook or to the mechanistic-versus-humanistic thinking that permeates much of education today. A union is needed between the empirical world and the ideational world, for theory without supportive data easily becomes intellectual wool-gathering, and practice without a conceptual scheme often is little more than a cluster of conditioned responses.

If education is to take its place beside other recognized fields of inquiry, then it must establish itself through a disciplined ordering of its domain. The first priority should be to develop a synthesis to lend order, which, in turn, will facilitate the development of conceptual models that integrate rational thought with empirical data. Education could begin the synthesis process by examining other disciplines' methods for advancing knowledge within their respective domains.

As an illustration, the physical sciences have advanced to their present sophistication through the use of approximation models in order to organize what is known about a particular subject or phenomenon and what seem to be plausible explanations for what is not known. By formulating, using, and re-formulating approximation models, the physical scientists create a focal point for research, thus avoiding random and fragmented effort which tends to lead to "re-invention of the wheel." The physical scientists view approximation models as utilitarian; any tendency toward elegance is curtailed by the incorporation of empirical evidence. Conversely, the use of empirical evidence is a necessary but insufficient condition in developing such models.

The description of matter through atomic theory is an excellent example of the evolution of an operational theory through a series of approximations over a span of time. The ancients viewed the atom as the smallest particle of matter that could exist and still maintain its form and substance. It was a static view of the atom, which today is considered a dynamic entity composed of electrons, protons, and neutrons held in orbital relationship within an electromagnetic field. The important point is that the change in outlook occurred in stages with approximation models--such as Dalton's and Bohr's--as intermediate points between early and present theory. Each approximation model represented an advance in man's understanding of the nature of matter, and through this evolutionary process scientists have arrived at their present stage of knowledge. Educators could well emulate this technique[1] by employing approximation models to organize and facilitate development of concepts of instruction based upon empirical data for use in teacher education programs.

For if there is one common shortcoming in nearly all teacher education programs today, it is the lack of conceptualization of the competencies candidates must acquire to be effective and a model of the instructional process itself. Most of the traditional teacher education programs do not have a model of instruction around which to formulate and develop their respective curricula. Consequently, because of the vacuum created by the absence of instructional models that could provide the necessary structure for development in some systematic and progressively sophisticated manner, the courses within many teacher education programs suffer from a lack of continuity. Bases in empirical evidence as well as in theory are essential.

For example, there is a growing body of empirical evidence that strongly suggests that neophyte teachers using the skills of set, pacing, and closure in their instruction are likely to have more productive lessons than the neophyte teachers who do not apply

[1]"But only by addressing ourselves to our own problems and phenomena under their own terms and context. The danger is always one of extrapolating models from one field and imposing them in another as a 'respectability strategy'." Henry Hermanowicz, Dean, College of Education.

these skills in their instruction. In a few teacher education programs, set, pacing and closure are considered to be the basic skills of instruction and are deliberately taught in the early part of the program.

To return to the atom analogy, as the atom is composed of electrons, protons, and neutrons, so is formal instruction composed of set, pacing and closure. These three skills form the context in which instruction moves as a contiguous entity, and each has a unique and complementary function. Without the presence of all of the basic skills in instruction, continuity is destroyed and the likelihood of achieving the anticipated outcomes in the lesson are reduced considerably.

Just as the difference between an oxygen atom and a nitrogen atom is due to a difference in the number of the three basic particles that constitute each, differences among the methods of instruction result from quantitative rather than qualitative differences in the basic skills. In the inquiry method of instruction, for example, the prevalence of the pacing component is greater than in the lecture-discussion type of lesson. The relationship of set, pacing and closure in an inquiry lesson as opposed to their relationship in a didactic (here meaning straight presentation of information) type of lesson is not yet fully understood.

For, as the atom has in addition to the three basic elements several sub-particles--leptons, mions, pions, and mesons--whose precise nature and relationship are not clearly understood, so too are there several sub-components in the instructional process the importance of which is not precisely known. Such sub-components would be stimuli variation, reinforcement contingencies, alternate frames of reference, and various feedback procedures. It is the relationship of these sub-components within the context of instruction that probably accounts for some of the variation in lessons using the same topic, content, method of instruction and having the same objectives.

In order to enhance the developmental process for teacher education programs within an organized scheme, the following is offered as an illustration of the interrelationship between the basic components of instruction and of learning, for the teaching skills of set, pacing and closure set into motion the three basic requirements of learning which are motivation, practice and reinforcement.

The teacher, who is expected to have acquired the necessary skills to plan, conduct, and evaluate instruction, is required to lead formal instructional sessions to help bring about the anticipated learning within each pupil. Each instructional encounter will lead to teachable moments which may be either positive or negative, depending upon the anticipated goals for learning and the effectiveness of the teacher in orchestrating the encounter. A highly effective orchestration of set, pacing and closure will increase the probability of a greater number of positive teachable moments. Conversely, a relatively mediocre orchestration would indicate that one or more of the essential skills were inadequately developed or absent from the instruction. Thus, there would be a higher probability of a greater number of negative teachable moments.

Positive teachable moments lead to desired outcomes or products in the form of experiences. These experiences are made up of added knowledge and understanding of a subject, skills with which to perform a given task, or the development of new or modification of existing attitudes or values. The new experiences should be intermeshed in some way with previously acquired experiences which have changed the behavior of the pupils and the teacher in some degree. Ideally, the pupils should have, after a lesson, a better understanding and appreciation of a subject along with increased skills to cope with more sophisticated study of the subject, and the teacher should acquire a better understanding of the pupils and their future instructional needs.

What is described above is essentially a performance-based education concept. The word "performance" itself connotes action or motion regarding some task or activity, implying not random movement but rather a disciplined and orderly flow in which there are present some constants providing structure to and continuity within an action.

Again, using the analogy of the atom, there is dynamic activity within each atom, yet it is orderly and disciplined because there are constants--electrons, protons, and neutrons--which provide form and substance to each atom and continuity among atoms of like and unlike elements. There is, as well, dynamic activity within the various parts of the Performance-Based Teacher Education programs generated by opportunities to practice and demonstrate instructional skill and kept orderly and disciplined by the constants--set, pacing and closure--which underpin every formal instructional encounter. Regardless of the method of instruction employed, these skills form the basis of the instructional process and activate, as mentioned above, the requirements of learning--motivation, practice and reinforcement.

Related to the dynamic quality of Performance-Based Teacher Education programs is the assumption that the programs move in some direction and serve a generative function. Movement or motion itself does not insure generation of new forms, but programs which have demonstrated high generative capacities do possess the element of dynamism within the performance context.

Basic characteristics of P.B.T.E. programs are the provisions for clarity and continuity throughout the program without restricting the versatility of the components. The application of the systems approach in program design enhances the possibility of greater precision and continuity through its demand for internal consistency among stated objectives, prescribed activities and assessment procedures. For example, one indication that a P.B.T.E. program has provided for continuity is provision for and use of on-going assessment or formative evaluation procedures. Through continued monitoring of program operations, it is possible to identify and to remedy problems that cause program dysfunction and loss of continuity.

To illustrate what is meant by the generative factor in P.B.T.E. programs there follows a description of the present status of programs which has evolved from the genesis in the early 1960's with the development of microteaching and the initial research on several instructional skills and strategies at Stanford University.

The first generation of P.B.T.E. programs included some form of microteaching in traditional programs. This was coupled with early techniques of assessing instructional performance, using at times video-recordings. Usually the microteaching experience was dove-tailed with the methods course which preceded the period of student-teaching. In some cases new course and seminar arrangements were added by designers in an attempt to gain flexibility in the program. While these attempts seem today to be nominal and perhaps primitive, they do represent the original steps away from the traditional academically oriented programs toward a more performance-based premise.

The second generation of Performance-Based Teacher Education programs emerged during the early 1970's with the advent and application of systems designs which include specifying objectives in precise terms. The introduction and use of instructional modules was another part of the second generation of P.B.T.E. programs. Also, greater use of electronic technology was undertaken to individualize instruction and to expand the potential of the microteaching dimension in teacher education. Field-centered activities using the portal-schools concept were later innovations in P.B.T.E. programs of the second generation.

Both first and second generations of P.B.T.E. programs mark departures from the traditional style of preparing teachers, but their departure is more like two short approximation steps away from the traditional into an undetermined number of approximations needed to evolve a new and dynamic pattern of preparing teachers. Both first and second generation P.B.T.E. programs still rely, for the most part, on a traditional view of the teacher as primarily a dispenser of information, and there has been little substantive change in curriculum content and sequence. Symptomatic of this condition is the lack of clear-cut rationales regarding a perspective of teaching, the type of instructional environment, and the instructional competencies needed to function in that environment.

Further, there is little evidence that the present P.B.T.E. programs have been formulated from a perspective that includes the field institutions within the programs beyond student-teaching experiences. There are still separations between academician and educationist and between collegiate and field personnel in the programs, and insufficient data to determine the extent and depth of involvement of the various groups in the planning and decision-making processes.

But the primary indication that the first two generations of P.B.T.E. programs are more traditional--or less generative--than anticipated is their lack of formative evaluative procedures and corrective mechanisms. Without the continual monitoring of program operations as an integral part of program function, it is rather difficult to determine whether the continuity of the program is being maintained and which phases have become obsolescent and needed modifications instituted.

The upshot is that while the first two generations do represent movement away from the traditional form of teacher preparation, progress has not been as great as the most fervent advocates claim. These stages do indicate, however, that there is a beginning in a chain of approximations on a path leading to new patterns of educating teachers.

In terms of the emerging pattern of the third generation of P.B.T.E. programs, which are mostly in the drafting and early prototype developmental stage, it seems that this generation will have the following characteristics:

1. Broader and more interdisciplinary in scope, planning and decision making.
2. More intelligent utilization of technology based upon coordination of human and physical resources.
3. More inclusion of applied experiences integrated with academic work throughout the program.
4. Increasingly shared work and responsibility between collegiate and field personnel in program development and assessment.
5. Conceptualization of what societal educational needs are and what type of teacher is needed to fulfill these needs.

6. Parallel to P.B.T.E. programs, curriculum assessment and revision within the participating elementary and secondary schools toward performance-based instruction. Preparing competent teachers through a performance-based program demands that teachers have equivalent instructional environments in which to apply their skill effectively.
7. Incorporation of formative evaluation or on-going assessment procedures as an integral part of the total program.

In terms of the generative function of a P.B.T.E. program, the single most important characteristic is the incorporation of formative evaluation procedures within a program. The purpose of formative evaluation within a program is two-fold: first, to monitor the program to optimize the function of its operation and second, to continually assess the program and its objectives in terms of evolving and emerging societal trends.

Some of the pivotal questions within the scope of formative evaluation of a program are:

1. Where are the "soft spots" or weaknesses in the program operation?
2. At what point(s) in the operation is there the highest frequency of problems?

3. What provisions have been made for identifying and handling emerging and unanticipated problems?
4. How much time is required to cope with operations problems?
5. How does the decision-making apparatus function? Does it include follow-through procedures?

Continual program assessment is insurance that the dynamic quality of a performance based concept will be maintained throughout the evolutionary progression of programs. Conversely, without this critical element, activity tends to become random and programs to stagnate and ossify.

The current drift in education and the anomie which exists among many professionals could be resolved if there were an acceptance of the "generative" concept in teacher education programs based upon the application and use of approximation models as program organizers. A unified focus and purpose among scholars and practitioners would be promoted and, concomitantly, an orderliness within the domain of education would be instilled. Thus, the spirit and promise of the performance-based notion in education would be fulfilled.