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By-Morgan, Robert M.

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In May 1967, a group of individual school districts from around the nation joined forces with the U.S. Office of Education to devise and execute a long-range program for the development of a new secondary school curriculum and organization. The program is called "Educational Systems for the Seventies" (ES '70). The 18 participating schools represent a cross-section of the nation's schools. The planning effort for the project has identified four broad classes of activities to be carried out: (1) Staff development, (2) instructional management and career guidance, (3) school management, and (4) evaluation. The activity having the highest priority is the setting of educational goals and operationally defining the performance objectives. Each graduate will have received a comprehensive education including the requisite background for college entry and salable job skills. This will be accomplished by individualized instruction. The project also provides for the development of models for curriculum development. The use of computers will be necessary in the management of the learning function and for data processing purposes. A number of related activities have already been started to assist ES '70. (HW)

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ES'70 - A Systematic Approach to Educational Change[1]

Robert M. Morgan
Florida State University

In May 1967 a group of individual school districts from around the nation joined forces with the U,S, Office of Education to devise and execute a long range program for the development of a new secondary school curriculum and organization. This network of cooperating schools calls its program "Educational Systems for the Seventies" or more briefly - ES'70. There are 18 schools from 15 states representing old, new, small and large communities. They are distributed nationally, serve culturally diverse constituencies, and range in community educational financial support from the poorest to the very wealthy. The districts range in population from 28,300 to 2,152,000. The combined student population of the 18 districts approximates 1.3 million students. 37% of the youngsters in these schools are from families with annual incomes below $5000. While these schools do not represent a statistically balanced sample of the nation's schools they are collectively representative of the kinds of schools we find in any significant numbers.

Each of these districts has dedicated one of its high schools, having grades 9 through 12, to this effort. Insofar as possible these high schools will be exempted from any policies or regulations which might constrain the research and development flexibility.

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[1] Presented at American Educational Research Association meeting, Los Angeles, February 7, 1969.

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There are several salient existing or anticipated features of the ES'70 program worth noting.

1. It should provide an individualized program of learning experiences for each student.

2. These educational programs will be empirically developed against operationally defined educational objectives.

3. It is a minimal goal of the program to provide a comprehensive education for each student to include an academic preparation sufficient for college admission and to provide each student with at least entry level occupational skills. It is a hope of the program to build learning systems of sufficient power to meet both of these objectives for each student better than they are being met separately in today's traditional high school.

4. As the program becomes operational it should be economically feasible within available public resources.

5. The planning and development of the program will be based on educational research and the behavioral and other related sciences.

6. It will appropriately utilize educational technology.

7. Its administrative practices and organizational structure will be fitted to, and designed to facilitate its learning programs.

8. The control of the program planning and direction will reside with the participating local and state education agencies. Coordination will be provided by the Bureau of Research, USOE.

9. It is being financed by federal, state, local and private funds.

10. It is being designed so that ultimately it will be available to other schools as a validated alternative to their existing practices.

This program grew out of the recognition that there are many critical variables in the educational system which affect student learning and these instructional objectives, the role of teachers and administrators, the physical environment, the motivation and background of students, the administrative practices, the instructional processes and more. Research has been done on all these variables usually treating one independent of the others. Yet, maximizing the effect on student learning of any one of these is constrained

if the educational researcher is not free to appropriately change the other variables. If all the major components in an educational program are to be optimally articulated one might conclude that the smallest experimental unit for significant educational change is a whole school.

The ES '70 planners have been engaged now for almost two years in developing a blueprint for this effort. This planning effort has attempted to identify all of the activities that will be required in building the new educational program. These activities have been put in sequence, estimates have been made as to their cost, and tentative identification has been made of capabilities around the nation most suited to take on particular activity. These projects cover a wide range of requirements but fall generally into four broad classes: (a) staff development, (b) instructional management and career guidance, (c) school management, and (d) evaluation.

The specific tasks range from the preparation of inservice training programs for staff to the analysis of design requirements for facilities. The plan anticipates that courses as we now know them may be changed and that Carnegie units as a measure of student progress may become inappropriate. Therefore, new accreditation and student certification practices may be necessary. The activity having the most pressing priority relates to the setting of the educational goals and operationally defining the performance objectives. Performance objectives define the output specifications for the new system and must precede design of the system. The ES '70 schools, as has been indicated, have already agreed upon their broad aims. Each graduate of this yet to be built program will receive a comprehensive education. He will have the requisite academic attainment for college entry and also salable job skills. He will be equipped to cope with the socio-economic environment as an adult. These are ambitious goals and will require a powerful

educational system if they are to be realized for all students.

Without performance objectives there is no basis for deciding which learning intervention or teaching strategy would be most effective. When decisions on teaching strategies have been made without performance objectives there is no empirical means for determining the degree of effectiveness of the strategy employed. Too often decisions about changes in instructional practice are made in terms of what someone thinks is the effect of the practice on what is hoped to be the result--without verfication. Consequently, systematic program revisions are virtually precluded.

There are other important reasons for specifying the outcomes of educational systems. It is necessary for longitudinal validation of the effectiveness of public education in preparing young people to cope with the social and economic environment when they leave school. Unless we know with what behavioral attainments a youngster enters the adult world, there is little basis for relating his later success, or lack of it, back to his school experience. Another reason for needing behavioral objectives relates to cost effectiveness of educational programs. The American taxpayer will inevitably grow weary of continuing to vote increased taxation for educational funds with no tangible evidence of the effect these funds have on the education of his children. With the performance objectives it should be possible to associate behavioral change with program cost. Student learning should certainly be the most if not the only basis upon which cost effectiveness analyses are made in education.

There are two realities that must be acknowledged as the job of developing a complete catalogue of objectives for a secondary educational program is begun. First, not all of the things that students should achieve from their educational experience can be defined in terms of specific observable behaviors.

However, a large part of what a student should learn can and should be objectified. Second, no single catalogue of objectives will be acceptable to the schools. To assume that the civics objectives acceptable to the Montgomery County, Maryland Schools would be acceptable in Montgomery, Alabama is not realistic. Local schools vary in their educational goals and they will also vary in their performance objectives. There is, however, probably a much higher degree of commonality in objectives across districts and regions than is presently supposed. Although the schools in the ES'70 network are geographically disparate, it should be possible to get agreement on most of the objectives, with room for local variation.

For the objectives to be acceptable to the school certain conditions must be met as they are developed. It is essential that discipline scholars, generally recognized as authorities, be intimately involved in the work. It is equally important that on-line classroom teachers in the discipline, together with local curriculum planners, be part of the team effort. Writing performance objectives is a demanding technology and a skill in short supply. It is essential that an experienced behavioral technologist be centrally involved in the work. It is also important that appropriate representatives from professional organizations such as the National Science Teachers Association or The Association for the Advancement of Science be included.

To carry out this undertaking, the Bureau of Research in the U. S. Office of Education is attempting to identify the most promising organizations and is inviting them to submit proposals for the development and classification of performance objectives by subject matter. Proposals will be or have been solicited in each of the following areas: mathematics, science, communications (reading, writing, speaking and listening) performance arts, social studies, vocational development, and personal and social skill development.

Undertakings in this phase of the development of performance objectives will hopefully be completed by the end of 1971.

The second phase of this effort will involve the establishment of a center to receive the performance objectives from the discipline teams as they are developed. This national center will include on its staff discipline people representing the teams who developed the initial listing of objectives. Consideration is being given to the establishment of two such centers to insure the successful completion of this phase of the program. The first center has already been funded under the direction of Dr. Bruce Tuckman at Rutgers University. A second parallel development effort is yet to be funded.

It is possible that there are wasteful redundancies in teaching similar objectives in the several disciplines. More important, there may be essential educational goals and objectives which have fallen through the cracks one finds between disciplines. It may be in the interest of efficient learning more sensible to reclassify certain of the objectives in groupings that are independent of the disciplines from which they were derived. It is possible to speculate for example that some of the basic principles of science could be better taught in an industrial arts or home economics setting than in the science class. Grants have been made and will continue to be made to insure a flow of objectives into the center from which the finished, integrated catalogue of objectives can be developed. The catalogue should include both interim and terminal performance objectives in hierarchical form, with specifications as to contingencies between sets of objectives. It should be possible to complete certain sets of objectives before other sets which will permit starting the development of the learning materials and programs well before the total objectification project is completed.

Once these objectives are set, and agreed upon, all the other variables of the educational program need to be arranged in such a way as to optimize student attainment of the objectives. It should be possible to experimentally manipulate the other variables disregarding where possible, the traditional constraints found in the educational system. This can only be achieved through careful and systematic planning.

The ES'70 plan also provides for the development of models for curriculum development. These models will be built and tested before the larger expenditure required for the development of an entire curriculum is begun. Obviously learning media and appropriate instructional strategies are two additional interrelated system variables. A careful examination of possible media/learning strategy combinations will be necessary. Films, computer-assisted instruction, programmed texts, instructional television, group discussion, tutorial relationships, laboratory demonstration, simulation games, work projects, tapes, records, and many more must be systematically considered in relation to efficient accomplishment of specified performance objectives and this must be done in terms of individual students. It will also be necessary to consider the possibility of new roles for teachers in the learning environment. In place of traditional teacher behaviors, the teacher may become more of a resource person and a manager of the learning environment.

To this end contracts were let in late 1967 to Sterling Institute, Westinghouse Learning Corporation, and the New York Institute of Technology. These studies were designed to yield answers to some important questions in curriculum development. How powerful can such a system be in terms of how much is learned in what period of time? Can we find principles governing media selection as opposed to blind trial and error? How much reckoning must be taken of what Jerome Bruner calls "Learning Style"? What roles can the computer effectively play in such a system? What is the minimum computer power

required and what is the maximum that can be efficiently used? What are the most effective uses of human resources as contributors to the operating system? What different instructional approaches will need to be taken as course content varies from high structure to low structure? What are the real development and operational costs of computer managed, multi-media courses? What kinds of organizations can be expected to develop this kind of curriculum? These studies should serve as guideposts for the ES'70 curriculum development efforts. These three studies which are jointly funded by the department of Navy and the U.S. Office of Education are going to cost for the 3 year period of the contracts about 9 million dollars.

Other studies sponsored by the USOE which could be regarded as curriculum model development projects are Harry Silberman's work with the Southwest Regional Laboratory and the Los Angeles Public Schools and Bob Glaser's work with the Oakleaf School in Pennsylvania. These studies differ in a variety of ways such as reliance on off-the-shelf materials as opposed to developing new instructional resources. They also address different academic levels and areas. The similarities however are greater than their differences. All are designing learning interventions based on carefully specified behavioral objectives and all are using the computer to mediate between the student, his individual performance on the objectives, and the inventory of instructional resources related to the objectives.

In a sense, these projects are programming the instruction in modular pieces, using a variety of media with redundancy across the pieces. The computer based upon earlier validation data, can select for a student a mosaic of learning experiences whose particular makeup is uniquely tailored to that student. The instructional power of this approach is yet to be demonstrated but will need to be very dramatic to justify the developmental costs which are estimated at around 30,000 dollars per instructional hour as contrasted with around 2,000 dollars for programmed instruction.

The use of the computer in the management of the learning function when added to other data processing applications in education, underscores a need for an economically viable computer utility for educational services. Indeed the curriculum envisioned probably would not be feasible without these services. One other activity under the ES '70 plan will be the establishment of such a utility. This utility should be developed within the next two years and should serve as an operational demonstration of educational applications of the computer which range from administrative data processing to computer based guidance system. This utility should serve several contiguous school districts. The estimated cost of the design and development of this utility is 7.5 million dollars for the next three years.

While the three activities described thus far, that is definition of performance objectives, curriculum development models, and the computer utility, are the largest presently under way, there are a number of related activities that have been started: These include work at Nova University under the direction of Professor Joe Lipson on the analysis of teacher roles in an individualized instructional system. This study should yield information about the requirements for more effective utilization of teachers in an individualized educational program, including an empirical basis for differentiating staff functions.

Research is underway by David McClelland and Al Alschuler of Harvard University on Need Achievement as a motivational strategy in an education program. In the ES '70 effort student motivation will not be taken as a given characteristic that cannot be modified. Preliminary research indicates that it can be enhanced. McClelland's work on need achievement and Lloyd Homme's research on reinforcement contingency management seem to hold promise for an insight into problems of student motivation.

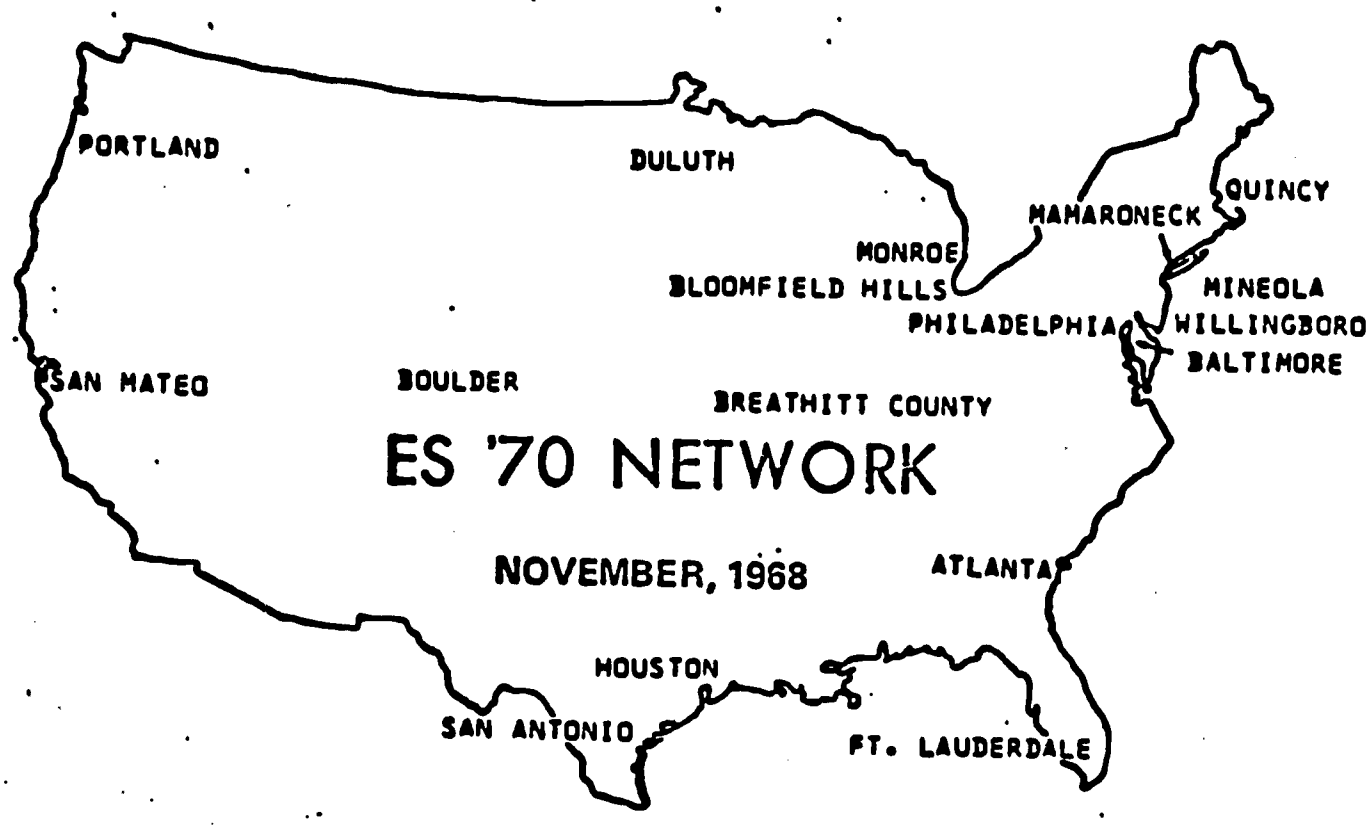
The Western Association of School Accreditation is presently engaged in examining new student certification and school accreditation approaches that make central in this process student learning. If courses as we now know them do not survive in the ES'70 effort then clearly it will be necessary to develop altenate means of recording student progress and of certifying student performance. The Western Association of School Accreditation in cooperation with some of the other regional accrediting associations is presently studying ways of developing alternate means.

Many studies which were ongoing and indeed even completed prior to the inception of ES '70 have relationship to the ES '70 effort and can be fitted into that overall plan. Modular scheduling, differentiated staffing, computer-based guidance systems, information management system development for schools are all programs that are underway independent of ES '70 but whose findings can make a contribution to the ES '70 effort.

Coordination is critical if the total system is to work. Each of the 18 schools will have responsibility for testing particular parts of the system before the entire curriculum can become operational. Each school district has an individual who serves as a liason with the other districts and the related research projects being conducted around the country. This individual is also responsible for implementing changes necessary in his district. Policy decisions and delegation of tasks and responsibilities are decided at periodic meetings in which each school distric participates. In order to coordinate the entire effort planning meetings are also held with representatives from the U.S. Office of Education, superintendents, members of the boards of education, state education department personnel, private foundations, and others. For a total systems planning effort, it is necessary to involve, at the beginning a great variety of institutional representation.

Much remains to be done. Variables must be more specifically defined, tasks must be appropriately delegated, and the nature of the learner must continually be kept in mind. In short, the planning effort is large, but a study that systematically analyzes the effect on learning of all the major variables is a first step in building an optimum curriculum.

The consequences of this several years effort should be a curriculum which can serve for a school system as on alternative to existing curricula. It should be capable of adoption in whole or in part by a new school, that is one having no involvement in its development, with maximum adaptation. Its output objectives should be tangible, demonstrable and replicable. It is encouraging to note that the resources essential to such an undertaking are available and that there are schools willing to participate in these innovational activities. The concept of a truly integral and excellent educational experience can become a reality for the nations young people.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ES '70 NETWORK
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SAN ANTONIO
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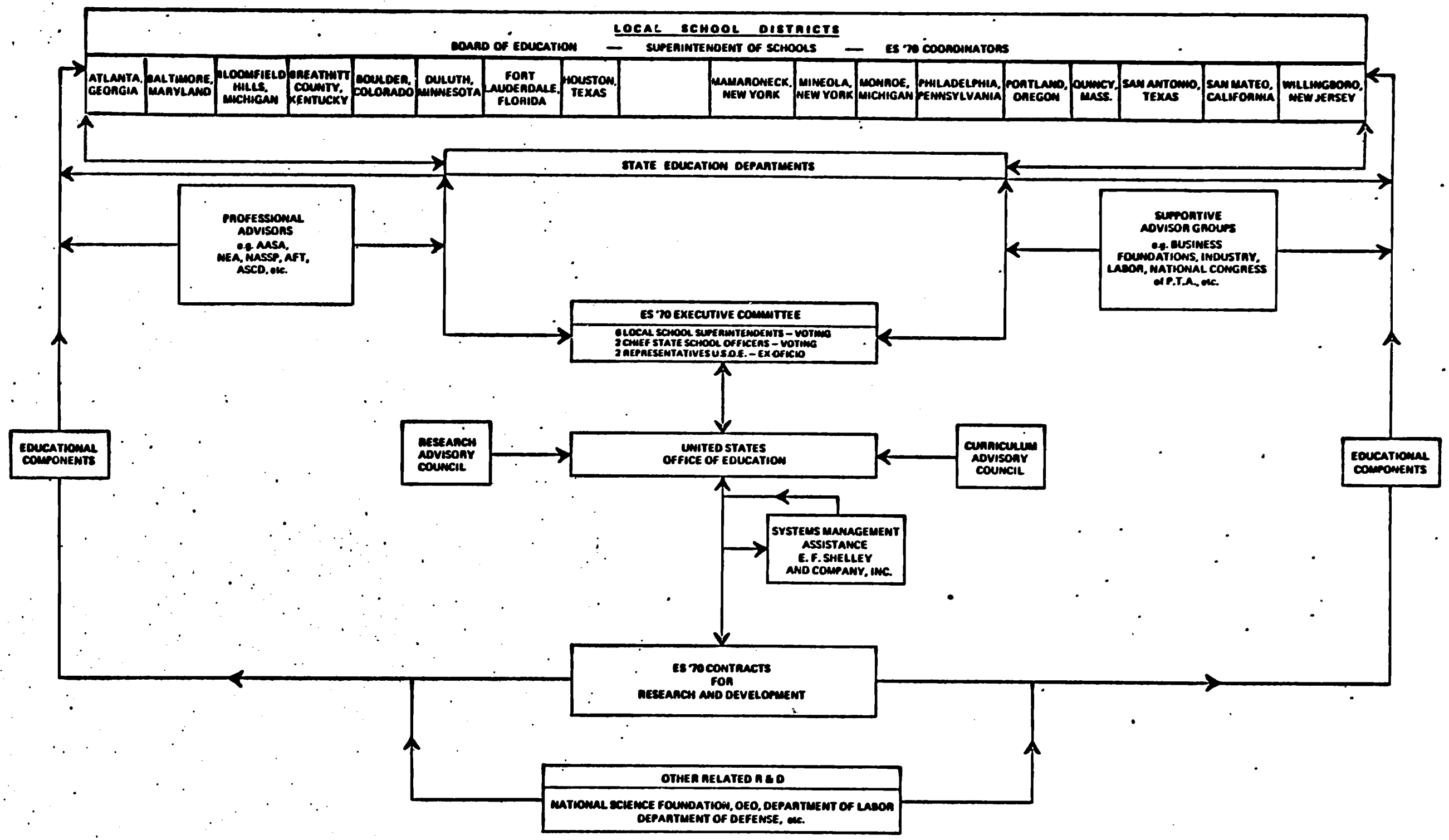
ES '70 ORGANIZATION STRUCTURE



LEGEND:

———— POLICY MAKING, STAGING, VALIDATION AND IMPLEMENTATION

———— POLICY RECOMMENDATIONS

———— RESEARCH & DEVELOPMENT

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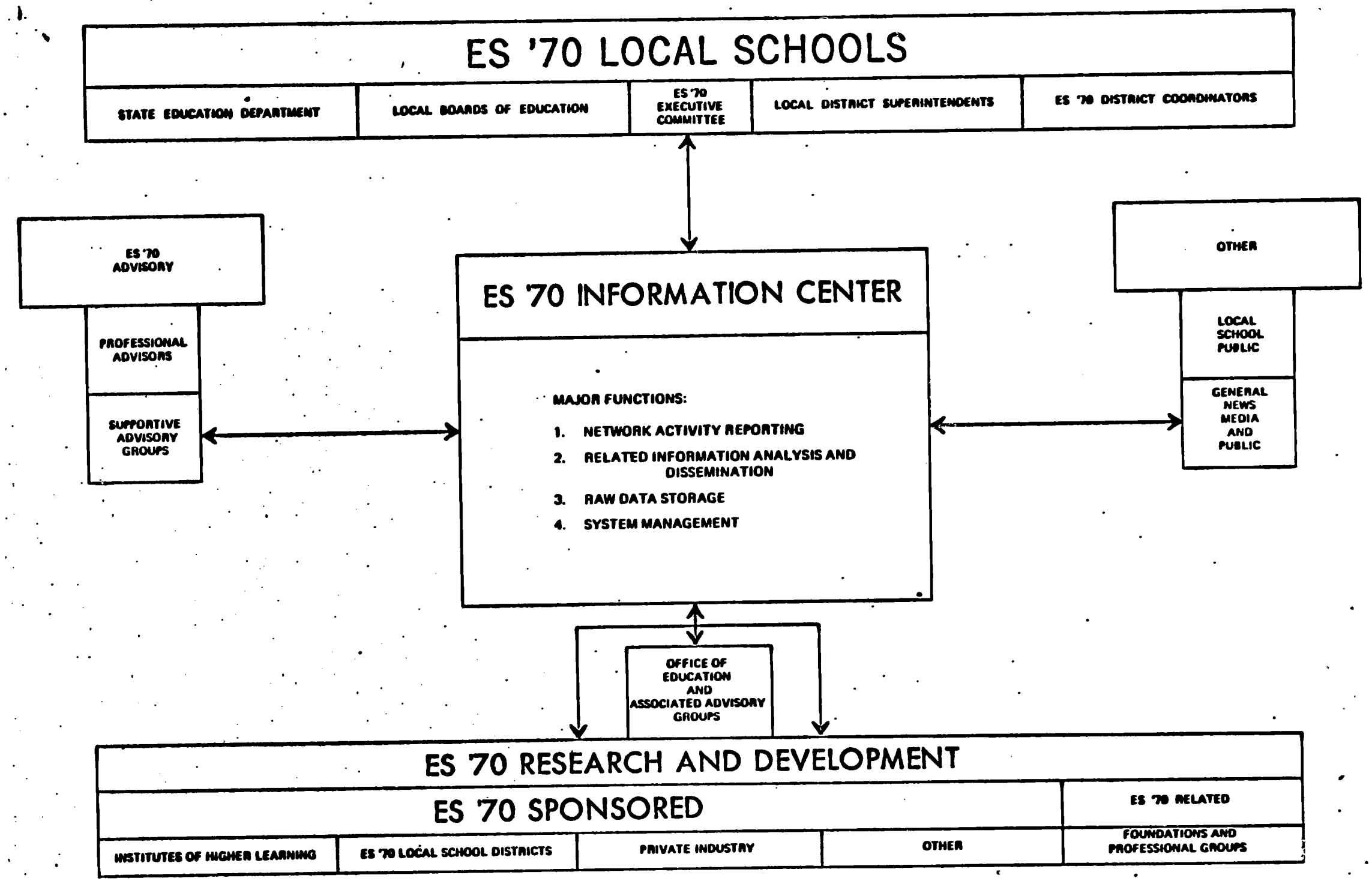

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