    The purpose of this study was to explore the feasibility of utilizing the systems approach in developing an office occupations curriculum congruent with the concepts in the organic curriculum theory. The title of this project is New Office and Business Education Learning System (NOBELS). An analog system model was developed as the framework in which NOBELS could be developed and tested. The feasibility of NOBELS was evaluated by four criteria: (1) The plan was supported by professional leadership, (2) The plan evolved from available interdisciplinary thinking, (3) The plan provided a structure with profession-wide support and a feasible operational structure, and (4) Dissemination and determination of dissemination, advocates, and acceptors were an integral part of the over-all plan. Face-to-face meetings were held to solve problems and conflicts. Six drafts were written before all criteria of feasibility were determined to be met. (MM)

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A PLANNING STUDY TO DETERMINE THE
FEASIBILITY OF DEVELOPING A NEW BUSINESS AND
OFFICE EDUCATION CURRICULUM

Moonshot--An Office Occupation Curriculum

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June, 1968

U.S. DEPARTMENT OF
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SUMMARY

The planning study was one in which feasibility of proposed curriculum plans in business and office education was evaluated by four criteria: (1) the plan was supported by professional leadership; (2) the plan evolved from available interdisciplinary thinking; (3) the plan provided a structure with profession-wide support and a feasible operational structure; and (4) dissemination and determination of disseminators, advocates, and acceptors were an integral part of the over-all plan.

Six drafts of a curriculum plan were developed before all criteria of feasibility were considered met. Major problems met and conflict resolution in reaching a defensible plan are reported.

The plan accepted for a New Office and Business Education Learnings (NOBEL) uses an analog system model as a framework for development. The next step of the over-all project is the development of a set of educational performance goals that represent business and office education--goals developed from hardware and software authorities of emerging office occupations and from empiric data collected of office worker tasks.

The professional structure now operative is Delta Pi Epsilon's Board of Governors for Research and Development. The Center for Vocational and Technical Education in agreement with the Board will continue as prime contractor, subcontracting with other institutions as deemed necessary to complete any future phases of the plan developed.

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INTRODUCTION

Moonshot, as the business and office education curriculum project was first called, was initiated by the National Business Education Association Research Foundation, a department of the National Education Association, in October, 1966. Yet, a curriculum project with nationwide impact needed support of more than this one organization. A feasible plan would need support of the leadership from all organizations and all segments of the profession. Thus, at a meeting of business and office research leadership sponsored by NBEA's Research Foundation in May, 1967, prior to the study herein reported, an ad hoc Business Education Study Committee (BES Committee) was formed to lead to representation from the total profession in planning for curriculum renewal.

"A Planning Study to Determine the Feasibility of Developing a New Business and Office Education Curriculum," developed by the BES Committee, is the subject of this report. In addition, the appendices contain papers commissioned and presented early in the study. Their content provide interdisciplinary reaction to potential direction of a nationwide curriculum project such as Moonshot and to application of a system approach and behavioral methodology in curriculum renewal. Available here for the first time, their contribution is to all those who would design or implement a new curriculum, whatever the field.

Four Criteria of Feasibility Used in the Planning Study

Any one of the teacher education leaders of the BES Committee could have developed a plan of action for curriculum renewal; but that any such plan of action must be determined to be feasible was also a condition of the study. "Feasibility," for our purpose, was defined in four ways.

1. The first criterion of feasibility was that any plan of action developed had to be supported by most of the professional leadership.

2. A second criterion of feasibility was that a plan of action would encompass available interdisciplinary thought wherever it could be found. Behavioral and other social sciences were viewed as sources of knowledge and method that represented a gap as between what the business and office education curriculum is now and what it might become. The criterion required the use of interdisciplinary thought from the social sciences: e.g., behavioral science and other learning theory, social psychology, economics and business administration, engineering (systems), communication sciences, educational technology, and research design and development.

3. A third criterion of feasibility was one of an adequate organizational structure: a structure representing (a) a profession-wide leadership support of any plan of action developed; and (b) an operating

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structure to implement it.

4. The fourth criterion, the acid test of feasibility, was one of dissemination and acceptance. Dissemination has been an integral part of the planning study. Thus, steps were taken in the planning study to identify the various audiences who are the disseminators, advocates, and acceptors of proposed curriculum products. This last criterion required the continuation of these dissemination plans.

The foregoing criteria of feasibility are inherent in the objectives as identified in the study proposal:[1]

1. Develop procedures for instituting a massive curriculum project in office occupations.

2. Establish the organizational structure for administering the entire project.

3. Develop the guidelines for the scope of the proposed curriculum project.

4. Determine procedures for developing behavioral objectives:

   (a) review and assess the objectives and classification systems in current use for secondary educational programs

   (b) develop the criteria and procedures for building a complete catalogue of specific behavioral objectives for Moonshot curriculum program (grades 9-12)

   (c) develop a system for classification of the behavioral objectives

   (d) validate the criteria, procedures and classification system by developing representative sub-sets of behavioral objectives.

5. Develop procedures for communicating the Moonshot concept to the profession.

6. Identify the talent available in the profession who will participate in Moonshot.

The planning study as herein reported thus required the development of a plan of curriculum renewal in business and office education determined to be feasible. The method of achieving this goal is the topic of the next discussion.

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[1] Notes and references identified are listed in the reference section.

METHODS

Operating Framework

Feasibility of any plan of action proposed had to be determined within the operating framework designated by the BES Committee as follows:

1. A steering committee from the BES Committee members was delegated responsibility for implementation of initial stages of the planning study to determine feasibility. (2)

2. The Center for Vocational and Technical Education at The Ohio State University was designated as the prime contractor.

3. The principal investigator was named and operated through the Center by subcontract with The University of Michigan.

Developing a Plan Acceptable to the Professional Leadership

The first task required interdisciplinary reactions to the hunches suggested in the planning proposal: namely, that a systemic approach consistent with concepts of an organic curriculum (7) and based on behavioral theory and method could be employed in a curriculum action plan in business and office education.

Within one week after funding (June 29, 1967), interdisciplinary consultants in the area of industrial relations and behavioral science, educational psychology and technology, systems research and design, and educational research and development design were retained with the following assignment: "On July 30 and 31, 1967, you will meet with representatives from business and office education in Chicago. You are asked to react to the proposed curriculum project as outlined in the planning study, criticizing its assumptions and hunches, and offering suggestions of direction which in your view such a project should take." Each of these consultants was located at the principal investigator's university because of the limitations of time and resources. Yet, each was a national leader in his area of specialization and actively engaged in research and development in his field.

For the principal investigator and his staff, the month of July was filled with meetings, group and individual, with the above consultants and with consultants retained by and with the Center staff.

Two other behaviorists were commissioned to make presentations in Chicago: Morrison (Appendix A), then director of the Quincy, Massachusetts (3) curriculum project, and Canfield (Appendix B), then vice-president in charge of instruction at Oakland (Michigan) Community College. Oakland College was a newly developed thirteenth- and fourteenth-year level school with curriculum developed and taught following an educational systems approach.(28)

In addition to the BES Committee and the Center's and principal investigator's staff, representatives of Research Coordinating Units and state supervisors of business education were invited to participate in the Chicago meeting.

Growing out of July 30-31 meeting, two four-day writing conferences were scheduled for August 5-8, and 12-15, 1967. The purpose was to draft a detailed plan of action for the total curriculum project. Two research design consultants were commissioned to write the plan with project personnel and other individuals as available from the BES Committee.

The draft from these writing conferences was reviewed by each consultant who had worked on some phase of the planning study, each person in attendance at the July 30-31 meeting, and special consultants called upon for the purpose by the Center (Appendix K-3).

A special one-day review session with representatives of Federal and state supervisors was held at Columbus on August 22, 1967. Informal reviews by national research leaders were also asked for and received.

The combination of feedback from all sources led to the following methodological decisions made early in September:

1. An extension of time of the planning study from October 28 to December 31, 1968 was requested.

2. Revised drafts of the plan of action should retain the systemic approach to total curriculum renewal.

3. Interdisciplinary jargon of the first draft should be translated to language that could be readily understood by business and office educators.

4. While retaining the total system approach to curriculum renewal, only one phase of the system model should be attempted, the development of a set of performance goals for business and office education.

Thus, the last three months of 1967 were primarily times of writing, review meetings with Center staff and Center commissioned consultants, and rewriting. Six separate drafts of the proposal were prepared before general consensus of feasibility of the plan was reached.

In the first two months of 1968, with the planning project extended further through February 28, development of data collection instruments and of training programs for investigators and performance goal writers was initiated.

Developing an Organizational Structure

The third criterion of a feasible plan of action, was developing a structure (a) representing profession-wide leadership support and (b) an operating structure. Of the two, the first was more critical requiring meetings to debate alternative structure and to strive for consensus.

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The criterion imposed a standard of agreement on structure, which, though not requiring unanimous consent, required more than a mere majority. Thus, two meetings held on structure resulted in but a slight majority for organizing a nonprofit organization. The principal investigator prevailed with his steering committee to seek some other plan that would obtain greater support.

After acceptance of the professional structure, developing a constitution and by-laws required additional meetings and dialogue. Added organization meetings were held to insure profession-wide representation and a delineation of operating policies which on the one hand would insure professional responsiveness to plans of action and which on the other permitted a close liaison with all operating units.

Developing an operational structure grew naturally out of that structure used in the planning study. The method for determining future operating structure was one of review and modification of that used in the planning study by professionals and operating personnel.

Developing a Plan of Dissemination and Identification

The fourth criterion of feasibility related to dissemination and the development of a plan for identification of disseminators, advocates, and acceptors. By method of determining, this criterion was the only one that could be separated from the mainstream of the investigation. Thus, determination of the first three criteria of feasibility was the primary responsibility of the principal investigator. The fourth was separated with budget retained at the Center for dissemination and funds allocated to personnel at Wayne State University for a plan of identification. Details of methods used and their results are contained in Appendix G and H.

Thus, the specific methods of the planning study have been described. Only the specificity of detail modified slightly the general outline of method originally proposed.(4) As a summary of method employed, the general outline as then stated follows:

1. To convene a panel composed of personnel with the following competencies. research design, curriculum design, behavioral science, business administration, business education, and systems design to develop procedures for the project.

2. To secure adequate representation of the total profession and all the fields that impinge on the proposed project:

    (a) preliminary steps have been taken through the organization of the Business Education Study Committee by leaders in the field.

    (b) further steps will be taken to form a nonprofit corporation whose sole objective is to carry out the Moonshot curriculum project.

3. To convene a group composed of selected teacher educators, super-
   visory personnel, executives, and classroom teachers to secure,
   recommend, and to develop the parameters of the total project.

4. To secure a behavioral scientist to:

   (a) review the literature pertaining to the development of be-
       havioral objectives and have him produce guidelines for
       use in office occupations;

   (b) use these guidelines for writing behavioral objectives for
       the project.

5. To have a position paper developed on the recommended dissemina-
   tion procedures to:

   (a) disseminate the Moonshot concept to our audiences: teacher
       educators, state and local supervisors, curriculum and
       other specialists;

   (b) to use the position paper in developing a pilot project to
       inform in-service teachers about the scope and content of
       Moonshot;

   (c) to use the position paper to prepare materials for keeping
       city and state supervisors, RCU directors and other members
       of our audiences informed of the project.

6. Identify the talent available in the business and office educa-
   tion profession who can participate in the Moonshot project:

   (a) develop a roster of selected personnel: city supervisors,
       state supervisors, business teacher educators, and others;

   (b) secure "talent data by means of a mailed instrument to the
       above (see Appendix G for a suggested talent inventory in-
       strument);

   (c) develop a computer program for analysis of this talent
       available for project Moonshot.

RESULTS AND FINDINGS

From the current study, curriculum renewal in business and office
education has been deemed feasible and a plan for implementation has been
drawn.(16) The major feature of the plan is a process of renewal which
is inherent in the specifications of an analog system model. Future plans
for curriculum renewal are based on this systemic model. Yet, to describe
the result of the study as a systemic model without also describing the
time-consuming, tedious, and frequently frustrating process of conflict
resolution needed to derive the present status would distort the findings.

The method of planning to determine feasibility imposed the seeking
of interdisciplinary viewpoints. It imposed the exposure of any tenta-
tive plans derived to the critical appraisal of many segments of the pro-
fession. It imposed the critical scrutiny of the BES Committee, 21
scholars who would naturally subject any proposition to which they must
later subscribe to critical appraisal (5).

The diversity of thinking provided a continuing round of problem
solving. Each problem, though not always answered adequately for the one
who proposed it, required on the part of the principal investigator staff
an acceptance, reassessment, rewriting, debating, and writing again to
the point that resolution at least permitted accommodation.

In retrospect, the crux of feasibility later determined, was the
early acceptance of the systemic model of curriculum renewal, a process
model. The "New" Office and Business Fducation Learnings (NOBEL) ana-
log system model is reproduced on the next page. The emphasis on pro-
cess rather than product turned out to be a most important means of con-
flict resolution. While men of goodwill might not resolve all their di-
verse views on the product sought, they could and did agree on a process
for achieving it.

NOBEL System Model as a Process

Theoretically, the NOBEL system model accommodates differing philo-
sophic values, values that serve in place of perfect knowledge. The feed-
back circuitry of NOBELS provides closure making the system self-correcting.
Whatever values tested through the system, the resulting feedback and
modification should lead at least a step nearer to perfect knowledge,
thus lessening the gap among differing values.

The NOBEL system process requires specification of values to be
tested in design criteria which, if not measurable, are at least asses-
sable in terms of over-all performance of the system. The NOBELS model
further demands the specification of the immediate set of expected learn-
ings stated in behavioral terms. The means of attaining the expected
learnings are defined in terms of persons, processes, or properties as

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1. DESIGN CRITERIA

General Objectives for:

. Persons
. Processes
. Properties

of the system under consideration.

2. PERFORMANCE GOALS

Operational Objectives for:

Persons, expressed in terms of specific skills, and role expectations; Processes and Properties, expressed in terms of rules and regulations (the normative structure under consideration)

3. INPUTS (OUTPUTS)

Description of:

. Persons
. Processes
. Properties

included in the system under consideration to arrive at goals.

4. OUTPUTS (INPUTS)

Performance Measures of:

. Persons
. Processes
. Properties

included in the system under consideration.

FEEDBACK CIRCUITRY

ANALOG SYSTEM MODEL

FOR NOBEL

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"input" or application. The application yields "output" of learning which must be assessed in terms of performance of the learner. The assessment of output supplies the feedback circuitry with data necessary for analysis and modification. Feedback circuitry thus provides for closure of the system. The analog model for NOBEL is described further in Appendix I.

Initial Limitations

In a practical way, NOBELS was limited to business and office occupations education. Yet, the system tryout could just as well be the broad area of business and economic education, distributive occupations education, any other vocational area, or any phase of education in general. The focus on office occupations as the starting point was dictated by the educational background and experience of the original Committee. The generality of NOBELS model has, however, been the impetus for initial parallel planning in the broader area of business-economic education. It has also motivated inclusion of distributive educators in the organizational structure and close collaboration with all areas of vocational education.

The first product viewed for curriculum implementation, a set of performance goals that represents business and office education, may well be input to a combination of general education goals consistent with organic curriculum concepts.(7) Such a use will, of course, require a different organizational structure than one limited to vocational or, as now, a limited area of vocational education. The ability of NOBEL system to be used later as a sub-system input for a broader educational purpose is as least face validity of the flexibility inherent in the model.

"Purists" Versus "Developers"

From the beginning, initiators as individuals and as groups have recognized "research impurity" of the development-type project of curriculum renewal. However, the BES Committee (5) supported the development process as a practical means of influencing classroom practice in the immediate future. While the NOBELS model accommodates all applicable "test-tube" findings, it further invokes a test of application of those findings in "real" learning situations where many variables may not even be identified, let alone controlled. The support of the profession for the development-type project recognized the immediacy for curriculum renewal, an immediacy that cannot await test-tube purity of knowledge.

Tabula Rasa

Carpenter (Appendix D) suggested capturing "good" current programs as a beginning test of the systemic model. Unfortunately, "goodness" in current business and office education programs has not generally been defined in specific and assessable terms. Even those programs of reputed goodness would have had to be analyzed in terms of their presumed performance objectives and their outputs reassessed in those terms. The "clean slate" decision made recognizes the office occupation (current

and emerging) as a source of potentially valid performance goals for learnings programs, goals that can be deduced directly from office tasks rather than from often dimly viewed goals of some current programs and whose validity remain in doubt.

Analog Versus Mathematical Model

Wilson (Appendix C) discouraged business and office educators from professing to a systemic approach to curriculum renewal because of the imprecision of any first attempts and the absence of resources to attain a mathematical preciseness. The NOBEL system model developed primarily by Hill (8) recognizes that any learnings model will be imprecise now and perhaps oversimplified. Yet, the model does invoke assessment and feedback circuitry providing self-correction—a necessary first of many steps which may eventually lead to mathematical simulation.

The danger of oversimplification in the current model has, of course, been recognized. For example, the model does not reflect important inter-faces of the curriculum with the business office or of impinging legal authority such as local, state, and Federal authorities. The model does not reflect adequately the subordinate position of business and office education as a part of a total educational system. The model may also inadequately depict subelements of the system such as the student, the object of all learnings programs.

Even with recognized limitations, though, NOBEL does provide a systemic framework which can be understood and thus embraced by classroom practitioners, a requisite later to advocacy and adoption of any curriculum product.

Communication Gap

Failure of translators as among disciplines often leads to lack of understanding or misunderstanding. First statements of the systemic model were sometimes clothed in the jargon of those steeped in the technical vocabulary of systems design. Misunderstanding and dissatisfaction resulted among professionals in business and office education. Translation to nontechnical language became a necessity. Further simplification and standard meanings of terms is recognized as a continuing problem as classroom dissemination and advocacy proceeds. One such attempt to simplify interdisciplinary ideas is contained as Appendix L. While the loss of disciplinary depth is not here assessed, the acceptance of even approximations of thought from other disciplines by business and office educators depends upon such translation.

Experiential Validity Versus Thomism

By "experiential validity," we mean the determining of business and office learnings based on tasks that can be observed or experienced in "real" offices. By Thomism, we mean a theoretical framework that provides the order and method of a disciplinary approach to learning.

The conflict of functionalism versus a disciplinary approach is not unique, of course, to business and office education. Its current emergence as a problem results from recent technological advances in information handling and consequent development at collegiate levels of communication or information sciences.

Out of the hardware and software technology has developed thinking that would equate office work with portions of information science. The idea is that such a parallel provides in information science a theoretical base for analyzing business and office occupations education and thus for developing a "discipline" for business and office education.

The preoccupation with theory building to provide "a new way of looking at office occupations" can be recognized in the original planning and feasibility proposal. Here, various Venn diagrams were used to isolate office work as a means of leading to the theoretical framework.(9) A three dimensional analysis scheme similar to Guilford's earlier "Three Faces of Intellect," (10) was also proposed.(11)

In the educational area, Krathwohl's and Bloom's taxonomies (12) were thought provoking as were the work of behaviorists like Gagné.(13) The affective domain of Bloom has served to awaken the educational community that learning must be concerned with more than the cognitive. However, that the affective domain can be or even should be separate from the cognitive in office-task learning is not clearly seen at this time. Gagné's Conditions of Learning will prove helpful later as office tasks are arranged in a learning order.

The difficulty with utilizing earlier conceptualizations as the foregoing in the planning and feasibility proposal, intriguing as they are, has been one of demonstrating their validity in the "real-live" world of office work or their practicality in developing new business and office education learnings programs.

Motivated, however, by these earlier conceptualizations, the staff at the Center for Vocational and Technical Education has developed a three dimensional scheme for classification of office activities (verbs) according to managing, operating, and interacting domains. (14) The taxonomy as a means of classifying empiric data collected from offices does provide an immediate and useful tool. That the taxonomy will, in fact, provide a "new way of looking at" or analyzing office work, the desired theoretical framework, remains to be proved. Yet, this systematic classification scheme could well be a first step toward the "new look."

Another problem related to developing a theoretical framework is the extent to which sets of office tasks, even valid in terms of those tasks performed in the "real" office, teach the methods of "learning to learn," problem solving, or adjusting to novel situations--characteristics of office workers needed for adaptation to changing tasks. Perhaps the methods of information science, i.e., system analysis, or methods used by the accountant to analyze financial transactions must be taught apart from the office tasks to be learned. Behaviorists lean toward a view that problem solving is inherent in the tasks necessary to be learned--a view that needs further study.

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Total Versus Partial Systemic Testing

Through interdisciplinary thinking, a first draft of NOBELS followed a pilot testing plan of the total systemic model. In this draft, a limited set of learning objectives were to be selected from business and office occupations; their means of learning (input) through persons, processes, and properties developed or adapted; their learning results (outputs) tested; and modification of the system or its first output made in terms of analysis. The system thus set in motion would then be applied to increasing segments of office education.

This first NOBELS draft was rejected for two reasons: (1) the system jargon used in writing the plan was confusing to reviewers from business and office education; (2) the foreseeable resources did not match the expected cost of even the pilot, some $2-million dollars.

While retaining the system model, a second draft limited initial steps of curriculum renewal to the development of a set of performance goals that represent business and office education. The absence of any such comprehensive set of goals had been noted, and their provision in specific behavioral language could lead to a counterbalance for the current overemphasis on classroom methodology. In fact, the specification of behavioral goals in a classroom situation could contribute to method by insuring teacher and learner of direction, often but vaguely discernable in classrooms today. Advantages of the second plan over the first are at least four-fold: (1) the tasks necessary to developing a set of performance goals is within the foreseeable resources of the investigators; (2) adaptation of the set of goals to classroom learning can be made immediately; (3) decisions about ways of using and testing the set of goals further in development programs can be delayed; (4) parallel curriculum programs can be formulated before the completion of the plan.

In the reporting thus far, the current status of the plan of action, NOBELS, some of the major problems determining NOBELS' feasibility have been described. Organizational problems were also important in determining feasibility, the next topic.

Organizational Problems

Another important set of time-consuming problems was those related to developing an organizational structure of the profession. The resulting structure has been detailed elsewhere.(15) In brief, the structure developed does represent all segments of the business education profession. It is one organized as a part of Delta Pi Epsilon, national honorary graduate fraternity, and called "DPE's Board of Governors for Research and Development" (Appendices K-1 and K-2). This entity has been organized as one to evaluate, to propose or to review proposals, and to seek funding for all proposals considered worthy of profession-wide support.

That such an entity does now exist attests the perseverance, energy, and goodwill of many leaders. The bias stated in the planning study proposal (16) was a nonprofit organizational structure separate from existing

organizations. A simple majority of the BES Committee favored the non-profit organization. A large minority viewed organization of a nonprofit organization as a proliferation of entities. Against conflicting advice, the principal investigator did not accept a simple majority as authorization for organizing a separate nonprofit entity. Instead, a BES Subcommittee was appointed to seek a structure that could be supported by most of the larger group. Delta Pi Epsilon tendered an invitation to organize as DPE's Board of Governors for Research and Development. Upon recommendation of the BES Subcommittee, the invitation was accepted with but one dissenting vote.

In tendering the invitation, DPE indicated a desire to provide an institutional home without line control of the Board's activities. Such a loose arrangement of control by DPE was feasible and desirable because of overlapping leadership in both groups. Such an institutional home was desirable because DPE as a national honorary fraternity in business education is the one organization to which all segments of the profession can and do identify.

With a feasible structure assured, a series of meetings was necessary to plan the internal organization--again, time-consuming but necessary to discuss issues and reach consensus on constitution and by-laws of the Board. The attainment of the Board of Governors as the structure met one important criterion of feasibility as defined.

The structure accepted for operational implementation of plans is the Center for Vocational and Technical Education who will serve as prime contractor for future funded projects as mutually agreed upon by the Board and the Center. Major portions of any contract are now planned to be subcontracted to other educational institutions. For example, the principal investigator for a proposed step of NOBELS will be located at Wayne State University (17) and the subcontract for his responsibilities will be one drawn as between the Center and that University.

Growing out of experience in the planning and feasibility study, the Center has now appointed a NOBELS Executive Committee as a policy making and review arm of the Center. Thus, the Center's NOBELS Executive Committee becomes the major group to propose policy, review and advise about work done at the Center and at the principal investigator's or other subcontracting institutions. The absence of such a policy group in the planning and feasibility study did lead to some confusion and, at times, duplication of effort. Such a policy group which clearly delineates responsibilities is a necessary control for the Center as well as a necessary link with leaders in business and office education.

Plan for Developing Behavioral Objectives

The decision that initial steps of curriculum renewal should involve development of a set of performance goals representing business and office education provided another series of intriguing problems to be solved. Behaviorists specified procedures for developing performance goals and relevant literature for their development.(18)

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Experiences of Morrison (Appendix A), Canfield (Appendix B), and Rummler (Appendix F) first identified the difficult problem of training classroom teachers to write relevant performance goals. Carpenter (Appendix D) also emphasized the critical problems of teacher education. The principal investigator using Mager,(18) Vimcet Filmstrips,(18) and Hite (19) has experimented informally with teaching performance-goal writing to practicing teachers, graduate students in his classes. In addition, Rummler and his associates have worked with the principal investigator staff in teaching methods used at the Center for Programmed Learning for Business of deriving critical behaviors, a foundation for performance goal writing. Further experimentation is needed and planned for the Summer, 1968, in developing a training program for performance goal writers. The tentative conclusions are these: (1) performance goal writing for the initial set of objectives representing business and office education will need to be developed and/or reviewed by leadership personnel in the field; (2) performance goal writing for NOBEL should not, however, be divorced in any important way from the business and office education investigators; (3) simplification of teaching of performance-goal writing and amplifying their values by teacher educators is prerequisite to advocacy and acceptance by classroom teachers.

Problems of Task Performance Data Collection

To provide a balance between the "oughts" and the "is's" of the set of NOBEL goals developed, the emerging office occupations are in process of being analyzed as an important input of "ought-to-be" performance goals. (Appendix H-1 and H-2). Empiric data of existing office tasks (the is's) are planned to be collected in nine population census regions of the United States.(20)

Judgmental sampling decisions have been made for proposed (20) data collection that approximate U. S. Census statistics (21) of office workers according to proportion found in certain Standard Industrial Code classifications businesses, in geographic locations and in size of companies, as well as according to sex.

A gradual development of performance goals and task lists prior to major data collection is viewed as one means of decreasing the redundancy of handling data collected. Yet, the frequencies of office task performance, their conditions and contingencies, and their varying standards of performance will provide significant data for determining relative importance of different tasks. A coding scheme tied to the new "Taxonomy" of Office Activities (14) will serve to classify like task data. Prophecy formulas applied to pilot data, however, may lead to a reduction of empiric data now planned to provide an adequate sample.

Data-collection decisions centered around Dictionary of Occupational Titles (22) (DOT's) versus some other scheme presented one interesting problem.(20) Even though DOT's and their accompanying descriptions are the best source of job classification information, census sources designated (21) at least one-third of office jobs as "not elsewhere classified." Also, the "average" descriptions of specific jobs contained in DOT's do

not necessarily match the range of tasks performed in specific office
jobs. Furthermore, the overlap of task performance as among office jobs
has been observed.(23)(24). For all these reasons, the decision was
made to select office jobs for data collection without reference to their
DOT or any other classification according to job title.

The decision to study jobs held by people between the ages of 16 and
24 year olds (20) was motivated by the need for collecting data from a
hierarchy of jobs held by a range of young people. The age range reflects
the need for those data to be relevant to tasks subject to inclusion in
learning programs of secondary, area vocational, and community college
level institutions.

Specific Job Task Data Collection Problems

A variety of methods for collecting relevant data from a specific
job has been explored and evaluated in terms of economic efficiency and
yield of relevant data. Observational techniques, time sampling tech-
niques, photographic and film techniques, critical incidents, group inter-
view, employee interview, supervisor interview, work samples, and combina-
tions thereof have been examined. A combination of job diary plus employee
and supervisor interview is now planned as the source of empiric job data--
yielding within one-half day of data collector's time the basic informa-
tion needed for performance goal preparation.(20) The specific instru-
ments and procedures are in process of being developed.

Social Role Data Collection

Through the influence of research in social psychology, a promising
type of data appeared at first to be the collection of social role data,
normative or expected, of office workers.(25) Further study, however,
does not support the collection as originally planned. To be sure, be-
havior of the individual office worker in task performance involves in-
teraction with people; but the interaction with other people and its con-
sequent coping problems is now viewed as an integral part of task per-
formance. Separation of social role behavior from any other task behavior
is not now considered a promising direction. Social role behavior will
be collected as an integral part of task performance.

Dissemination and Talent Inventory

Originally, the planning study proposed commissioning a position
paper on recommended dissemination procedures. However, early in the
study, the high priority of determining a theoretical framework as a
foundation for restructuring business and office education was recognized.
The Center's efforts were diverted, therefore, to this task. A discussion
of activities in the planning study as conducted at the Center is con-
tained in Appendix H.

The Talent Inventory, i.e., identifying groups of disseminators, ad-
vocates, and acceptors was an integral part of the planning study performed

at Wayne State University. The original plan was extended to include, and now includes a 60 percent completion of the follow-up of the talent inventory collected in the planning study and a 50 percent completion of an updated inventory of doctoral candidates. A detailed report of the talent inventory conducted through the planning study is in Appendix G.

Other Results

Throughout the planning study, a continuing responsibility has been that of developing liaison with other on-going curriculum development projects from which methodology could be borrowed or results incorporated. Frequently, published reports or first-hand accounts were sufficient. For example, the principal investigator of the Quincy, Massachusetts, curriculum study (3), formerly located at the American Institutes for Research in Pittsburgh, moved to the Center for Vocational and Technical Education as Research Coordinator. He thus provided first-hand information about this study. Other curriculum projects required visitation, and the following discussion is suggestive of the results of these on-site visits.

Within the geographical area of Michigan, visits have been made to Michigan State University's block-time office curriculum project (26) and Wayne State University's senior intensified program.(27) In both projects, innovative curriculum means are being demonstrated, based on current curriculum goals. As an opinion, each demonstration of learning results can, in part, be attributed to a Hawthorne effect on teachers and students, an effect that could well be incorporated in all learning programs. Both projects could profit from a set of specific behavioral objectives outlined as the next step of NOBELS.

Oakland Community College represents a pioneering educational effort in which all curriculum subjects, including distributive and office education, are based on an instructional systems approach.(28) A pioneer must overcome the bias of tradition among teachers. That Oakland Community College will be successful in its curriculum approach at this level of education is a hoped-for result. In the meantime, this systemic approach has influenced and is influencing community college curriculum in Michigan and other parts of the country.

Monroe (Michigan) Public School is an ES70 (29) school-designate for developing a systemic approach in general business and vocational distributive and office education. As yet, the development of performance goals in these areas has not gone beyond the planning stage. A most pressing need expressed by the faculty is that of a workshop to learn to develop behavioral goals.

Through the Research Coordinating Unit of Michigan, the principal investigator visited Lansing (Michigan) Community College. Individualized instructional courses have been and are being developed utilizing autoinstructional guides and teacher developed single-concept films and filmstrips.

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Dade County (Florida) Public Schools, (30) although not an ES70 designate, was visited because of its organic curriculum development project. A member of the Dade County Instructional Research team was a research associate in business education. In addition, innovative instructional means (e.g., programmed instruction, large group instruction in typewriting) were under development. A two-day visit to Dade County dispelled the concern that these efforts were parallel to the current curriculum plans. A coding scheme for behavioral objectives developed in Dade County will prove helpful in solving similar problems for educational purposes of office activities, office tasks, and emerging or current performance goals.

McCloskey, Perkins, Byrd, et al. were reported in process on a project titled "Knowledge and Skills Required for Clusters or Families of Occupations" (31a, b, c) including one study of empirical data collected for office occupations in the State of Washington. Their study is suggestive of the data collection problems to be encountered in NOBELS. Yet, NOBELS will modify data collection in terms of job tasks that can be stated in behavioral terms. By way of serendipity, Herbert Hite's report,(19) "An Experimental Model for Preparing Objectives," obtained while visiting Washington State University at Pullman provided an important baseline project for a training program needed to develop similar performance goal-writing competency in the next stage of NOBELS.

CONCLUSIONS AND RECOMMENDATIONS

The planning study involved developing a plan for a New Office and Business Education Learnings System (NOBELS). An analog system model was developed as the framework in which NOBELS could be developed and tested. The next step in NOBELS was determined as developing a set of performance goals to represent business and office job tasks.(6)

Four criteria of feasibility were applied to the plan with these results: 1. NOBELS plan is supported by the professional leadership, both those who are members of DPE's Board of Governors (Appendix K-2) and by other business and office leaders who were asked to review the plan. (Appendix H-1) 2. Interdisciplinary thinking was used throughout the development of NOBEL plan (Appendix K-3). 3. A structure of professional organization and of operating units is functioning (Appendix K-1). 4. Plans of dissemination and identification of disseminators, advocates, and acceptors are continuing (Appendix G).

The most pressing problems and conflicts met and resolved were primarily those requiring face-to-face meetings with adequate time for understandable communication, review, debate, and revision. Six drafts were written before all criteria of feasibility were determined to be met.

One advantage of a developmental project as NOBELS is that immediate recommendations are determined and often modified by preceding steps just concluded. Long-range recommendations, however, cannot be structured in any iconic form--except as a process for successive approximation toward the pictured result. The analog system model of NOBEL is such a process model admitting to closure and thus analysis and system modification through feedback about currently viewed results. We plan that each phase or movement toward the curriculum project will utilize the NOBELS model as a process of continuous curriculum renewal. We recommend further that system feedback be employed at each stage of th total project to modify as needed the NOBELS model more nearly to clarify the process of curriculum renewal. We suspect, for example, in its currently oversimplified form, the system model does not now adequately depict important interfaces of students, of teachers, of other educational systems of which business education is a subsystem, or of the changing business world.

In terms of individual students, any operational learnings resulting from performance goals will need to be modified in terms of pupils, their nature and nurture. While the best hunches of learning theorists employed to describe students must be utilized in a first tryout of a new learning set, these educated guesses, though an improvement over current practice, leave broad areas of ignorance about pupils and the way they learn.

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In terms of teachers, a movement away from traditional classroom practices presents to many of them a threat not readily overcome. A role change of the teacher, for example, from a traditional "giver of information" to a "manager of learning" is fraught with obstacles requiring a total educational system to overcome. In fact, the reluctance of public educators to move toward a systemic means where the product in learning can be assessed has been a prime motivation for other institutional structures to fill the breach.

In the area of performance goal development, the next stage of NCRBIS, initial sets of goals will need to be created, demonstrated, and advocated by leadership from all teacher education and behavioral fields. Yet, if the NOBEL systemic process is to become a self-renewing tool, means must be found for all classroom practitioners not only to learn how to develop performance goals in behavioral terms but to value their development as the foundation of curriculum and practice. Thus, we recommend that effort be expended in the next stage of the business and office curriculum project to develop training programs for performance goal development that promise to lead practitioners to competency in preparing and to value in using behavioral goals. Immediate dissemination of even interim results should be made to all teacher education institutions.

Attention of all areas of vocational and general education is called to the NOBEL systemic model developed through this planning study. We especially urge parallel projects be implemented in general business-economic, preparatory, and vocational distributive education areas. As the interface of business and office education to all areas of education and the total system of education is more clearly defined, the necessity for broad interdisciplinary thinking in all curriculum development as employed in the planning study will become even more apparent.

Vocational business and office education is unlike areas of general education whose curriculum reality is usually a compromise as between Thomism as dictated by collegiate disciplines and experiential validity represented by Deweyism. The validity of vocational office education is directly related to current or emerging tasks performed in the "real" business office. Though frequently studied, the interface of business to business and office education has been poorly understood. We recommend therefore, that the interface as between business and business education in the next stage of NOBELS be more clearly defined.

The impact of _Moonshot_ or NOBELS on the total business and office education profession has not been assessed in the planning study in any formal way. As a subjective judgment, leadership represented by researchers, business educators, and all levels of supervision recognize the necessity for NOBELS. The leadership is receptive to change and will, of course, become the advocates when change is recommended.

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2. The steering committee members were F. Kendrick Bangs, University of Colorado; Caltrey C. Calhoun, University of Georgia; Fred S. Cook, Wayne State University; Harry Huffman, Center for Vocational and Technical Education; and Frank W. Lanham, Principal Investigator, The University of Michigan.

3. <u>Development and Evaluation of an Experimental Curriculum for the New Quincy (Mass.) Vocational-Technical School</u>. USOE No. 5-0009.

4. <u>A Planning Study</u> . . ., <u>op</u>. <u>cit</u>., p. 22.

5. The BES Committee, as described later in the report, becomes Delta Pi Epsilon's Board of Governors for Research and Development. Membership of this Board is detailed in Appendix K-1 and K-2.

6. A by-product of the planning study was the concurrent development of a proposal to initiate the next steps of NOBELS: <u>Development of Performance Goals for a New Office and Business Education Learnings System</u>, USOE Proposal No. 8-0414.

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APPENDIX A

SOME PROBLEMS IN DEVELOPING CURRICULA
BY ANALYSIS OF PERFORMANCE OBJECTIVES[1]

Edward J. Morrison[2]
American Institutes for Research

It is a significant forward step to decide as you have that a cur-
riculum will be based upon analysis of the performance capabilities de-
sired of graduates. I would argue that this is the proper basis for all
curriculum development. But many who are less convinced than I of the
validity of the general proposition would agree with you that specifica-
tion of terminal performance capabilities is essential to development of
relevant, effective, efficient vocational curricula.

For some time now, the American Institutes for Research has been en-
gaged with public school people in several projects to develop curricula
which are relevant to three kinds of student needs: vocational competence,
responsible citizenship and continuing self-fulfillment. The curricula
are intended to permit individually prescribed sequences and rates of
learning, to challenge each student to achieve capabilities of his own
choosing, and to develop the skills students will need throughout life
as they evaluate, select and pursue educational and vocational routes to
life goals. The graduates we seek are competent in all three of the broad
areas of life and flexible enough to adjust successfully to changing ex-
ternal requirements and personal needs.

The analytic-empirical procedures we have used to develop curricula
from such general goals as vocational competence, responsible citizenship
and self-fulfillment are described in detail for one project in the re-
ports listed at the end of this paper and will not be recounted here. How-
ever, it should be noted that our procedures, as those you propose, were
designed to produce a curriculum defined by a sequenced set of objectives
stated in terms of the performance capabilities to be demonstrated by suc-
cessful students. Using empirical information on what competent people
must be able to do, our plan has been to arrive at the final set of ob-
jectives by identifying the whole domain of capabilities implied by each
general goal, selecting those capabilities to be included in our curricu-
lum, and then analyzing the selected terminal capabilities to define se-
quences of prerequisite capabilities. The curriculum must be stated in
terms of the things students must learn to do so we can have an adequate
basis for selecting the materials and activities to facilitate learning
of each objective, for defining methods by which achievement of each ob-
jective can be verified, and for sequencing the learning activities.

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[1]Based on one section of an address to a meeting of educators pre-
paring a proposal for a new office and business education learning system
(NOBELS) in Chicago, 30 July 1967.

[2]Now at The Center for Vocational and Technical Education, The Ohio
State University.

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In our attempts to develop curricula in the public schools by this plan, we encountered some problems. None of these problems has caused us to change our minds about the correctness of the development procedures, but we now have a much better understanding of the kinds and amounts of difficulty associated with executing the procedures and using the methods. This should be useful information for others, such as yourselves, who would proceed in similar ways. So, my purpose is to tell you about a few of our major problems and invite you to benefit from our experience.

Objectives

It has not been easy in my experience to get good performance objectives in any area and I think you will find it to be difficult in business education too. Many people object to performance objectives because they believe their subject's content cannot be "reduced" to behavioral statements since it deals with "understandings," "appreciations," "perceptions," and the like. No matter how hard you argue that such things derive their importance from their effects on students' abilities to do things, many people with whom you wish to work will find it impossible to define objectives in behavioral terms. Even those who can accept the concept of performance objectives often find that it requires a kind of thinking to which it is difficult or impossible for them to switch. Further, it is difficult to get consensus among subject-matter specialists on the definition and selection of performance objectives, especially in complex areas and in areas traditionally considered "thinking" areas, such as English and Social Studies for example.

So, I would caution you first of all that performance objectives are not easily obtained, though it is very easy to talk about them glibly. It is difficult to do the special kind of very clear, objective thinking required in preparing unambiguous objectives and it is easy to write objectives which are uncertain and obscure. Probably, you should plan on several cycles of writing-testing-writing en route to a set of fully effective objectives and their supporting learning materials and programs.

General Capabilities

You should be encouraged in your plan to search for generalizable capabilities and to include them in your business and office curriculum because the efficiency and power of the curriculum will be enhanced by their inclusion. However, you also should be forewarned that this commonly has been a more difficult undertaking than it appeared to be on first consideration. Many argue that we must train people so they will be prepared to "roll with the punch." No matter what happens in the labor market, no matter what happens in life situations, no matter what happens in the political world, these people would be prepared because we taught them the basic skills, the things which are general, the things which are generally applicable. But we have not found it easy to identify such generalizable capabilities or to teach them. If there are generally applicable capabilities, then it is obvious that we should teach them to everyone. The only questions are, "What are they?" and "How do you train for them?" On the answers to these questions, there is almost no agreement at all.

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There are numerous traps into which one may fall in trying to identify generalizable capabilities; let me illustrate two of them. First, some people refer to "general background material" and claim this to be general preparation. This use of "general" typically means "remote from reality," in the sense that what is learned is expected at best to contribute indirectly and with unknown probability to the learner's ability to deal with his life situations. Presumably, your decision to derive curriculum content from the performance capabilities desired of graduates was based on the intention to avoid content of such dubious relevance to students needs. In that case, this trap can be avoided by defining general capabilities to be those which are demonstrably useful in a wide variety of life situations of consequence to the student. Do not think of general capabilities as vague or remote from reality.

A second kind of trap is illustrated by those who say that there are many general capabilities in vocational education and produce a list which includes things of which blueprint reading and welding are fair examples. So far as I can tell upon reasonably careful examination, the only thing a blueprint used by a carpenter and a blueprint used by an electronics technician have in common is white lines on a blue background. There is virtually nothing else. Similarly, welding plates on board ship has virtually nothing to do with the kind of welding that goes on in an electronics production line. There is serious danger of believing we have identified general abilities simply because they all have the same name. Comparison of stimulus conditions, psychological processes, response patterns, and response modes, frequently reveals that such tasks have nothing in common which is important either for learning or for performance.

The identification of generalizable capabilities, the specification of appropriate conditions for learning them, and the description of the nature and extent of the generalization to be expected all would be facilitated greatly by an appropriate taxonomy of behavior. At present, we lack such classification scheme (but note the useful work of Altman, 1966; Gagne, 1965; Melton, 1964) and must tolerate difficulty even in identifying tasks which are essentially the same though occurring in a variety of contexts. Without the essential theory, we must resort to empirical definitions of task similarity. This is the problem with which we have contended and to which you should expect to devote considerable effort.

Proficiency Measurement

Our major concern in developing measures of student performance has been to ascertain whether a student has mastered the current learning task and is ready to go on to a new objective. I believe this is a major goal of your plan also. We had a great deal of difficulty in getting that kind of measurement. Consider a typical example of our difficulty. I was presented with a learning unit which attempted to teach a particular machine operation. The test asked the student, via multiple-choice questions, to explain how he might do this operation. This test missed the point entirely. The proper test would require the student to demonstrate that he can perform the operation. Our test writers tended to ask students to talk about the performance rather than to ask students to show them.

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This illustrates the persistent problem of getting representativeness in performance measures. Each measure of student achievement needs to be representative in at least two ways. First, the measure must be an example of the class of behavior which was taught by the learning unit. It can't be an example of something else and still be testing for the thing you are trying to teach. In the second place, the measure must be representative of the class of examples. Consider an example in data processing. It may be that you want the student to learn to perform all the standard sorting operations with a particular sorter. The test you give him certainly has got to be a sorting test. It can't be something else. And secondly, it should represent all the sorting tasks which he might be called upon to perform. The crucial issue is whether, having passed this test, the student has demonstrated that he learned what he set out to learn. Getting this kind of representativeness is very tough and is all the more difficult because we lack the behavioral taxonomy needed to define representativeness precisely.

Sequencing Learning

Our analytic procedure for deriving objectives provided a preliminary sequencing of objectives. That is, we started with the most general statement of what we wanted the student to achieve and we asked, "Now, what are the prerequisites for this?" Then we asked this same question of the first set of prerequisites, and the second set, and so on until we got to capabilities we judged to be within the repertoires of all entering students. This procedure was designed to produce an organization chart or logical tree relating each objective to its prerequisite objectives and, thus, to define all essential sequences among objectives. But this procedure, which requires the same kind of behavioral analysis you propose, turned out to be very difficult for many people to follow. The difficulty seems related to the need for completeness in stating prerequisite objectives. Whether because of problems in analyzing the behaviors involved in an objective, or because of a lack of the dogged persistence required for success, many people seem unable to develop the sequenced set of objectives which is required.

It should be noted that the problem of selecting the optimum instructional sequence for an individual student is not solved completely by our analytic procedure, or by any other a priori method. It is possible to identify the sequences which must be followed (in cases where A cannot be learned until one knows B), but this by no means specifies the sequential relations among all objectives. Further, students vary widely in terms of their entering capabilities. As a result, sequencing for individuals remains a problem for teachers who use the curriculum. They must be provided with information as to what sequences are critical, what liberties in sequence are available, and on what basis sequences variations can be elected.

A number of practical constraints pose problems in sequencing learning units and courses. If your curriculum is to be used by less than an entire student body, so that you must share courses, classrooms, facilities or staff with the rest of the school, then scheduling and logistics can constrain your learning-sequence plans significantly. Legal requirements also

can cause difficulty. In some states, for example, it may be that only high school graduates are permitted to enter a course in nursing. In such an instance, nursing must be delayed until the thirteenth and fourteenth years. It doesn't matter that students could learn the material at tenth grade; they are not permitted to try. All kinds of rules, regulations and plans, established by supervisory and accrediting bodies to handle circumstances other than those you devise, can constitute limitations and difficulties until there is appropriate corrective action. I don't know to what extent you will have such practical problems in business and office education, but they have been severe in some areas.

Teacher Training

Teacher training is a very important aspect of new curriculum development and implementation. I am delighted to see that there is some explicit recognition of this matter in the original planning of your project because it probably has been our most difficult problem. There seem to be two reasons for this. First, if you are dealing with conscientious teachers, they have honed and changed and adjusted over a period of years until they think they have considerable evidence that they are doing a good job. In their opinion, they've got something that works. Now, here comes something new. The teachers have seen many, many flashes in the pan that came and went and didn't amount to anything. They have seen some which, in their opinion, fell flat on their faces. Now, why should they take your brainstorm and use it when they already have something which is considered to be pretty good? Well, they can be persuaded, but it is not easy.

The second reason to expect difficulty is this: If I read your proposal correctly, you will be asking teachers to change their role completely, and this is a very difficult thing for them to do. The kind of role which one asks the teacher to assume in "individually prescribed instruction" or "individualized instruction" is so different from what they commonly do that it takes a great wrench for them to succeed, and many can not. This is a problem you must face up to now and plan a solution. Probably I should only announce this as a serious problem, because you are more expert on how to change people in this respect and on what to do administratively if you are not able to change them.

If these observations seem rather pessimistic, please remember that my assigned task was to identify significant problems in curriculum development. It would have been an easier task to describe the important achievements which cause us to be very optimistic about the improvements in education which can result when curricula are developed by analysis of performance objectives.

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SOME VIEWS ON PERFORMANCE OBJECTIVES AND INSTRUCTION

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A little background of Oakland Community College covering what we did, why we did it, and what we found will help you evaluate my recommendations.

Oakland County, Michigan (adjoining Detroit) has a population of approximately 750,000, an assessed valuation of approximately $2.5 billion, and includes both high and low income areas. It has been estimated that we have 30,000 poverty families in the district as well as some of the wealthiest families in Michigan. The college was noted into being in June 1964 by a majority of about 200 votes out of over 50,000 cast.

The college was opened to about 4,200 students on two campuses in September 1965. Our enrollment for September 1967 is projected for about 6,000; approximately 25% of whom will be in career programs--a percentage we feel is somewhat too low.

From the beginning, it seemed that the educational institution should key on the learner and his learning experiences. Being an institution without a lot of traditions and practices, it was possible to emphasize and consider many points of views. Much of my previous college experience, regretfully, was in situations which appeared to be oriented around the Registrar's Office, Business Office, or the faculty--since I was on the faculty, this emphasis seemed appropriate at the time.

I cannot recall a single meeting or conference during my years of employment as a college professor when the concept of improving human learning was introduced or considered as the primary topic of discussion. The evaluation of instruction in colleges, and perhaps too often in other places, is based on appraisal of the qualifications of the teacher and not on what the learner gets. There is an unverbalized assumption that if the instructor has a lot of information, the instruction will be good. In education the learners are transients, and in any situation where you have both transients and people who stay--the transients lose. But even though students are transients (some students are in and out so quickly they barely get counted). It seemed appropriate to make them our primary concern.

If you were going to start an instructional program that would key on the learner, what would you do? Certainly you would look at the results of learning research. We did not make a comprehensive, intensive analysis of learning theory because we really did not understand it. We can appreciate so-called principles of learning. Since we are primarily interested in humans, we felt that there were principles with which most people seemed

to agree; namely, motivation, active participation and feedback or reinforcement. There are, of course, other principles but these elements of learning were the ones we chose to emphasize.

It would also be appropriate to examine instructional research results. If instruction is the facilitation of learning--we should examine what we have learned about instruction. While learning is characterized by complex theories, there does not seem to be an equivalent theory of instruction. Instruction just happens like "Old Man River." The research we did find, particularly in higher education, was generally inconclusive. McKeachie's chapter in Gage's Handbook of Research on Teaching[1] is illuminating. It reviews 228 articles and studies concerning instruction in higher education. These references go as far back as a paper by Ebbinghaus in 1913 and includes a few from 1962. There is only one generalization in the chapter by McKeachie, and that is, ". . . knowledge of results facilitates learning . . ."[2] We have known this since Ebbinghaus, and for approximately 50 years have been reconfirming it.

On the other hand, there are all kinds of research to indicate that: T. V. can be good or it can be bad; large classes can be good or they can be bad; discussions can be good or they can be bad; color in movies can be good or it can be bad. While people have information that was not included in McKeachie's chapter, the chapter does not necessarily reflect everything we know, it is an excellent survey of the field.

In this regard, I have just returned from U.C.L.A. where I worked with Dr. Arthur M. Cohen (more about him later), and had a chance to review all the materials in the Junior College Clearing House for research on instruction. Only five articles out of something over 850 items in their collection seemed specifically instructional research. Most educators are disappointed at our lack of research on instruction. There is a shortage of hard-nosed interpretable research that can be used for guidance. Our reaction to the instructional research literature was that you could defend almost anything.

Based on our findings, we decided to examine the traditional instructional mode and see if there was a model of instruction that would do the job better. We could not find much evidence to indicate that the conventional lecture/textbook approach was effective. While it is conventional, traditional, easy, ego building, and numerous other things, we did not seem to find much information to indicate that it was effective in producing learning. We considered television and examined the Florida Atlantic experience; the Chicago T.V. College, the airborne television experiment and felt this approach might create too many problems for us--not because the data on television was somewhat questionable, but because we were not sure we could manufacture the software to put on the CRT's (picture tubes).

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[1]McKeachie, W. J. "Research on Teaching at the College and University Level," Handbook of Research on Teaching, Edited by N. L. Gage, Rand McNally & Company, Chicago, Illinois, 1963.

[2]Ibid., p. 1155.

We looked at computer-assisted instruction (CAI). In early 1965, CAI enjoyed considerable recognition. I.B.M. was starting to stimulate research on CAI at Pennsylvania State, Florida, Columbia, Michigan, and other places. Both television and CAI were expensive and both required a tremendous amount of author time since there were few, if any, programs that could be taken off the shelf. It does not seem that computer-assisted instruction, operating as a book-printing activity, is going to fly. This is a personal conviction based on 1½ years experience with it at Oakland Community College and in discussion with others. A potential and powerful role for the computer is in the management of learning where it can be diagnostic and prescriptive guides.

Other influences were less rigorous but equally, if not more, powerful. While on a recruiting trip looking for staff, I was asked to talk to a college class. After the professor introduced me and I had started talking, it was obvious that the students were not listening—they were reading the newspaper, nudging one another, looking out the windows and reading books. At the tuition rates they were paying, they were paying a heavy price, indeed, for the pleasure of attending college.

On my way back, I stopped by Purdue to see a man called Sam Postlethwait who is the most distinguished teacher and educator I have ever known. This man is the Albert Schweitzer of education. You must meet Professor Postlethwait, talk to him, and listen to him. He teaches botany in a small room in the basement of the biology building. The students are engaged in self-instructional activities, milling around learning botany. They study at carrels, using tape decks, viewing exhibit tables and reference materials. The students slip into the pool of knowledge as they wish. There are faculty members in the labs to whom the students turn for help or discussion. They do not have to try to catch the faculty after class. Postlethwait is often in the laboratory with the students, talking to them and asking them questions, and helping them appreciate the subject matter. The lecture is used very sparingly.

Even later, we ran across some people who introduced us to the concept of systems. This is a great time to get into the systems business. There is no one person who is acknowledged as the educational systems authority. For us, it meant behavioral objectives. I tend to prefer the term "performance objectives" because there is a negative reaction in some people to the term "behaviorist." People don't object if you say "performance." Terminal performance objectives are what people should be able to do at the end of a course.

We adopted the Magerian approach to preparing instructional objectives which is very well presented in Mager's book, Preparing Instructional Objectives.[1] We also needed carefully designed instructional sequences. We wanted to have self-instruction on a self-paced, multi-media basis so students could proceed down one of a number of different paths at their own

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[1]Mager, Robert F., Preparing Instructional Objectives, Fearon Publishers, Palo Alto, California, 1962.

rate. I call this the SIMPLE approach--Self-Instructional Multi-Path Learning Experience. We also wanted frequent feedback to the student and the staff. These three elements--objectives, instruction, and feedback are what make a closed-loop system. Feedback is used to improve and correct media and to assist the student in assessing his progress. That is what we set out to do--now what have we found?

We have found that people ask us for data all the time. When you innovate, people say, "Where is your data?" If you had data, you wouldn't be innovating. When we get into a corner we say, "Show us your data." That serves as quite an equalizer.

We found that if you know you are going to need research--go at it first--get your research designs identified early. Post facto research is a very difficult and awkward thing. In any study group (NOELS, for example) a research study committee might be appointed right now. This committee would develop some ideas about the kinds of research that will be done.

We found that the faculty is the most powerful force in the institution. Although we advised people when they came to seek employment that "this is what we are going to do," and asked them if they wanted to do that (they had to say, "Yes"), some simply cannot believe there is any learning going on when they are not talking. Let me give you an example.

Here is a student in a carrel and he has a tape deck, some slides, a frog, a scalpel, and some other items like books. We are going to have him dissect the frog so he can examine its reproductive system. While the student sits there with his scalpel, slides, tape deck, and is whittling away at the frog--what is the faculty doing? The faculty may be just sitting there. The student is working but the faculty member is not likely to feel productively occupied.

My personal reaction, when I go into a lab, is to go over by a student, watch him for a minute, and then if he does not look up and say something to me I will interrupt him. I say, "How are you doing?" and he says, "Fine." Then, I ask, "What are you doing?" He replies, "I'm cutting up a frog." Now, I ask, "Do you understand what you are doing?" He answers, "Yes," I say, "Do you really understand the importance of knowing the comparative reproductive systems of animals?" About this time, the student catches on. He knows I want to augment and enrich his education. So he says, "No, I don't believe I do." When he turns to face me, I give him a lecturette.

We have found it is virtually impossible for some faculty to sit quietly without either feeling completely non-professional or completely unproductive. We wanted them to be available to help students--but at the students' request. It is more awkward than we anticipated!

We spent many thousands of dollars to get 100 plus programmed books. They are good books and some are selling quite rapidly. We have found, however, that when faculty member A develops the materials for faculty member B to use, faculty member B does not always want to use them. He

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frequently wants to make or select his own materials. When we tried to get everyone to do the same things, with the same material, we got instructional "bootlegging." Let me explain.

We said that every section of the same course in the college would have the same objectives, the same examinations, and the same media. We found things such as this: One day I saw a faculty member walking across the campus with about six youngsters walking single file behind him--like a mother and young ducks going across a pond. They disappeared into a building in a little tight group. I didn't know whether this was an exercise in cohesion, a hippy workout, a love-in, or what was going on. Later I returned to the same area and saw the faculty member doing the same thing. I learned later that he was going into the learning lab where students were trying to study and he would say, "All right, you six people come with me." He would then walk over to his office where they would sit and be lectured. These sessions would last forty-five minutes and were called "discussion sessions." Hopefully, they did not hear about his experiences in the war, his first year of marriage, his economic or political views, or the other things some teachers often find time to tell their students. After discussion they would be returned to the learning laboratory and six other students would get the call. We call that "bootlegging" and tried to inhibit it.

Actually, when we tried to stamp it out, some faculty quit taking them outside and continued the sessions in the laboratories. It has been very difficult to get today's teachers, with their attitudes and feelings about the individual student, to sit quietly and watch students studying.

We also found that it is extremely difficult to train people to write performance objectives, particularly in the soft sciences and English (as you heard this last night) and even for some people in technical areas. Often they write pseudo behavioral objectives. They should be behavioral but when examined closely they are not. For example, an objective will read something like this:

"The student will demonstrate his understanding of the theory of magnetism by correctly answering six of seven items on a true-false test."

That sounds behavioral, but it really is not. You can do almost anything you want under the conditions of that statement. You might have seven Ph.D. level exam items, or seven kindergarden grade items. Almost anything that involves electricity could be used. If you try to convince people that there are bad and good behavioral statements, you can get into a lot of trouble. If we say that words like "know," "feel," and "appreciate" are bad and words like "list," "select," and "assemble" are good, you may encounter a very reasonable question like: "Are you trying to tell me that it is not important whether students appreciate democracy?" Relatively few people would say: "Yes, we don't think they should appreciate democracy at all!" Rather, one says: "Of course, we think students should appreciate democracy, but the geustion is how do you tell when they do?" The "good" vs. "bad" dichotomy creates a real conflict between the behaviorist with his operant statements and the generalist with his higher concepts. I think Cohen at U.C.L.A. has a good idea on this problem and we will talk about that later.

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We found that students often need a model. They need some example of what we are talking about. Students talk together and they need some models of what the program will do for them. One approach is to develop a skill hierarchy so that the student starts to develop marketable skills from the very beginning. Ideally, if a student comes to college and leaves after two days, he should be a little better vocationally qualified. In the business education field, for example, we thought if you could make a typist first, then a clerk-typist, you might grow into a stenographer, on to an executive secretary and ultimately an office manager.

We discovered that good self-instructional materials are not available and developing them is not as easy as it sounds. Based on Postleth-wait's experience, we thought a hard-working and devoted, sincere group of people could generate a lot of material. They did, and what a great cadre faculty we had! But it takes a lot longer than we thought. If you are going to implement an approach similar to ours, you will find that there are a lot of textbooks, a lot of journals, and some filmstrips--and then your voice drops. Single concept films, these little 8 mm. continuous film cartridges that are getting popular, are quite easy to make. In fact, we have found that, at times, it is cheaper to make them than it is to find out who made one and see if we can get it. Just the task of keeping track of single concept cartridges can keep a half a librarian busy. If you want the faculty to develop materials, try to keep the faculty and the materials in close contact. The insertion of a media specialist to help them can be trouble. Their relationship can develop along these lines.

A faculty member gets all enthused and goes to the media specialist and says, "I want to do this." The media specialist asks, "Where is your script?" The faculty member states, "I don't have a script but I have a Schaefer." The media man says, "Oh, no, no, no. I don't mean pen, I mean where is your script, your word for word story--under-lined and accented?" When the faculty member says, "I don't have a script," he is told that "you can't make a tape without a script." The media specialist then spends his time giving the faculty programs in script making. So when the faculty comes back with this script, the media specialist says, "That's not bad for the first try." And then, like a teacher with an English theme, red marks it. The faculty member observes, "Boy, this is hard isn't it?" The media specialist replies, "Oh, of course, it is hard. You don't think that becoming a media specialist is easy, do you?" Or the faculty member comes in to make a tape slide presentation and is asked, "Where is your story-board?" The same sequence can evolve.

If you want the faculty to develop materials, I say give them a tape deck and a course and say, "Good luck!" Then, stay out of their way. Even the crudest effort gives them a basis for what is so desperately needed--research.

Achievement standards are also likely to vary among the staff. Some faculty will explain failures by saying, "These are not college caliber students." With that attitude, the best media, the best objectives and the best exams in the world won't help. This "built-in" philosophy will

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eternally produce a student failure rate. If one asks, "Why do you con-
tinue to wash out half the freshman class?" and you are told, "because
they are the bottom half"--no matter what calibre comes in or what their
background training is, there is a selective elite prejudice operating.

In a visit to an engineering college some years ago, I was told they
would get all the new students in a big lecture hall and the Dean would
come out and say, "Now look around you--only 50 percent of you will be
here in two years--ha, ha, ha." It was sort of a promise and they kept
it. There are faculty who do not think they believe in this, but they
operationally subscribe to it every time they assign grades by counting
up from the bottom and giving the bottom 25 percent some kind of un-
satisfactory or failing grade. We ask, "Do you believe, honestly believe,
that 25 percent of the students are so ignorant they cannot catch on to
this material?" And they say, "It isn't that, it's that in comparison to
the other students, they do average or satisfactory work."

When one starts developing objectives, there is a tremendous source
of occupational information available from the United States Employment
Security Commission and its branches such as Michigan Employment Security
Commission (MESC), IESC, OESC, and so on. These offices have access to
volumes of analyses of occupations and jobs done in conjunction with the
Dictionary of Occupational Titles. There is a great amount of material
which can be helpful. Job analyses for years have been using perform-
ance verbs. By looking through some job analysis one can pick out the
performance verbs which will assist the faculty. In writing objectives,
rather than engage in a struggle of what is a behavior and what is not,
or what is a performance and what is not, I suggest that you go ahead
and gush out objectives--get rid of them, unblock, flood the area--some
of them you will later call goals. After you have done that, define the
behaviors the learners will demonstrate when they have met that goal.
Early inhibition is negative. If one tries to write an objective and an
examiner says, "No," it inhibits the flow of further ideas. If someone
has taken the time to say in his way what the goal of his instructional
program is, for example, to appreciate democracy--accept it, do not fight
it. There may be a lot of different ways people might convince you that
they appreciate democracy. Why not ask, "What are they?" When they start
to tell you, they are listing possible objectives. Dr. Arthur M. Cohen
of U.C.L.A.[1] has suggested this.

One of the biggest weaknesses I see with conventional Magerian ob-
jectives is that they are incomplete. Normally, they include a task, the
conditions under which it will be performed, and the criteria of acceptable
performance. We have had considerable trouble with this format. After
$2\frac{1}{2}$ years I have a positive suggestion. Let me use a simple example to
illustrate.

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[1] Cohen, Arthur M., "Defining Instructional Objectives," Systems
Approaches to Curriculum and Instruction in the Open-Door College,
Occasional Report from UCLA Junior College Leadership Program, No. 9,
p. 29-33.

In writing an objective you say, "The student will," as we do not like the insertion of the phrase "be able to." In a physical education course, for example, you might say, "The student will run 100 yards in street clothes on a level concrete walk with the wind velocity less than ten miles per hour in 12 seconds or less." With a little study, that could be improved--but off the top of the head, that is a behavioral statement. The task is to run 100 yards; the street clothes, etc., are conditions, and the 12 seconds or less is the criterion.

For some, when you hand that to the student--that is all! That ends it. It is all over! Unfortunately, it is not over--it is just starting. The student quite reasonably, often wants to know, "Why?" He will not always ask it, but just giving him the statement does not settle everything. If you put in a rationale for having this objective then you give the student some basis for doing it. You tell him why he should pursue this and suggest the gratifying kind of feedback he will get when he does this task.

This is not to criticize Mager. His contribution has been fundamental and far-reaching. We can move a bit forward, however, if you put in there an answer for the student who says, "Why?" In our physical education statement, for example, add the phrase, "In order to avoid the police." Now, for some segment of the student body that is motivational. They will work to run 100 yards in under 12 seconds. Seriously, you might say, "In order that your body will be strong so that you can with-stand disease." If we add a phrase, "in order to," or "because of" or something of this nature, it gives the learner a reason to learn. Incidently, objectives are generally in faculty language--the students talk about them and convert them into their own language. Why not put them in learner language first? When we write objectives, they are objectives for the learner so why not write in the learner's terms and personalize them?

My general reaction is that one needs outside help when training the faculty--outside experts if you will. If you have a large group of conventional faculty and a thin slice of innovating faculty in the same place, the larger group will ask a lot of sticky questions of the innovators in the lunch room and in the lounge. To even the contest, it helps if the innovator can say, "Well, Wilbur said it," or "Postlethwait does it," or refer to somebody off the premises. Among other things, the innovator needs an outside reference to whom he can divert hostilities.

In program design, I am a great believer in the principle of "over-kill" or, as it is called in education, "overlearning." We are too ready to settle for a one-time minimum level performance. We know that over-learning is a primary factor in retention. Principles, particularly, should be overlearned. The engineers overdesign bridges, why shouldn't we overdesign instruction?

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This reminds me of some interesting parallels between instruction and the field of medicine. The schools in the United States are like hospitals, people come there to get help and then go home. In schools, as opposed to hospitals, their stay isn't so long--you are not as constrained, and generally less dramatic physical things happen. The processes of diagnosis, treatment, and evaluation are the same. In school we give everybody basically the same treatment everyday and every year. It is called the lecture/textbook approach. If the medics who also diagnose, prescribe, treat, and assess, did not do careful assessing, we could still be using leaches, burning people with hot irons, and bleeding them. In education we do too little assessing. This is what I meant earlier when I commented on the need for research. Let me elaborate. Consider the medicine man's routine. When attending the sick he comes in, throws down a few feathers, does a little dance, and calls on the spirits. If the patient does not survive, it is the patient's fault or the spirit's fault. The medicine man did the dance right, but the spirits were not cooperative or out of the city.

Can you imagine the lawyer saying, "I have graduated from the finest law school, I have been admitted to the bar, I have been practicing for fifteen years but, unfortunately, all my clients lose." Or the surgeon who says, "I graduated from medical school, I completed my internship, I passed all the exams, and I am a member of the College of Surgeons, but all my patients die." Or the engineer saying, "I graduated from engineering college, I passed the Professional Engineering exam, I am an associate fellow in my professional society, but all my bridges fall down." What about teachers saying, "I am a teacher, I have my degree(s) and earned a credential, but my students do not learn." We must emphasize research at the instructional level. If we don't routinely assess the effectiveness of what we are doing, we will be like the medicine man.

The design of research, and the collection of data can be only done where the action is--between the faculty member and the student. We must re-examine not merely our curriculum and our methodologies, but the training of teachers to assure a commitment to the consequences of their instruction.

Well, that is enough conversation from me. Thank you and I hope you have some questions.

QUESTIONS TO DR. CANFIELD

Q. Do you do any pretesting?

A. Well, I would have to give an answer something like Dr. Morrison's. We give an entrance exam at the college called "A.C.T."

Q. And that's all you have, you don't have any program of individual testing or anlysis?

A. We don't get into individual examination unless there is some
evidence on the part of the student's performance that a special
kind of examination is indicated. If it is, we try to stay out
of that business and get them into the hands of a member of some
group. We have a fine group of counselors, excellent people. I
don't think any of them, really, is qualified to utilize depth
projective techniques. It has always been a little difficult for
me to figure out who is doing the projecting anyway. We aren't
against it, we really can't afford it and we don't have, as yet
anyway, any real indications that we need to do a lot of it. We
would like to do more pre-testing, but more concerned with the objectives
of the instructional program than the learning characteristics of
the student. No doubt, there is a major field for discussion here,
but we just aren't doing much in the personal counseling areas.

Q. What kind of procedures are you projecting to follow-up on your
students leaving the junior college? For example, their grades
in transfer colleges may not be meaningful for another 20 years.

A. We are trying, at the moment, at least, to get as specific informa-
tion as we can on every student who withdraws or who doesn't re-
enroll. This is no excuse, but as you know, some students just go
away, they don't bother to stop by and go through the formalities
of trying to ge their money back and all that. There are some who
walk in and say, "I quit" or "I've had it," and from those people we
get pretty good records because we interview them. Sometimes they
are interviewable and sometimes they are in a hurry and when you say,
"How come you are leaving?" they say, "I've got to go to the Army,"
Now, maybe they do and maybe they don't, but many of them have been
caught in this trap before where they are given real reasons only to
be lectured, censured, and humiliated.

We try to follow up if they go to universities and we try to follow up
with employees. We are doing it fairly crudely. In the first year of
the college we had 3,840 students on the fourth Friday. We mailed all
of them a postcard and asked them to give us some information. How
many do you think we got back? As I recall, only about 700 cards
were returned. Then we turned the balance over to the counselors and
said, "Call them up, will you?" We abandoned the project, because
we just could not get people to visit, even on the phone. The
counselors would call their homes and the parents would say, "We
will have them call you--yes--right away, of course," and nothing!
We sent postcards, we sent them first class, with stamps you know,
not junk mail and we didn't get much response. That was the first year.

With that negative experience, we haven't tried it since. We do
follow up with the universities and we think we have a good follow-up
system there. We are not doing much with employers, because we
just graduated our first class--it was quite small. I will, however,
give you an example of how data helps. We had 22 students in an
MDTA career program, and when we graduated 8, ther were a lot of
comments. "We knew that this crazy thing wouldn't work," "Students
don't like it," "they don't stay," and the whole routine. When we
we looked into it, we found that 8 of the fourteen who hadn't grad-
uated had taken fulltime jobs in the career field before they graduated.

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We placed 16 of 22, and that isn't bad! Another student entered another college fulltime. Another student entered Oakland Community College fulltime and three students dropped for financial reasons beyond our control. From looking pretty bad at first, it looks pretty good. But we haven't had the staff, maybe energies, or even the wisdom to do this comprehensively.

Q. I want to follow-up on this first question on testing. You talked about the diagnosis of entering student levels and I interpreted what you said to mean that in the individual courses, you would have some of this. It seemed to me, at least in our own program, many of the failures are a result of placing in the wrong place, or in the wrong course. They weren't ready for the course and we should have done something about it--either in the course, or prior to the course. Are you doing anything specifically in that respect?

A. Nothing much different, really, than most anybody else. The student has to see a counselor to enroll, and the counselor has a rule book and the rule book says if he hasn't had English I he can't take English II and that kind of thing.

Our long range plan, and we have an impressive computer-based evaluation system well along, is to pre-test every student in every career program and all students in every course. Call that diagnosis. This will give individualized learning assignments--call that prescription. We will examine student learning frequently--call that evaluation-- of both the student and our methodologies and media.

APPENDIX C

REACTIONS TO "MOONSHOT"

DEAN H. WILSON
Associate Professor of Engineering
The University of Michigan

As a person involved in industrial systems research, I have been
asked to react to the "Moonshot" proposal. Candidly, my reaction is
one of pessimism. I would like to say a few things about what appears
in the proposal.

Throughout the proposal appears the statement: "The systems
approach will be used in the development of the curriculum for busi-
ness office education." Now I might ask each one of you, "What is the
systems approach?" You would say, "Well, it has something to do with
performance measurement and it has feedback." This is the way it has
been described, and that is correct. Those parts of a system are neces-
sary to the systems approach. I might add, however, they are not suf-
ficient. You know if you write a proposal to the Federal Government
these days in Health, Education and Welfare, and put the word "systems
approach" in it, the probability of funding increases. But there is more
behind a system than just those two words. Let me give a couple of facts.
The military, who started using these words back in about 1950, has put
about 50 million years of work time since the 1950 in systems develop-
ment for application to military problems. So don't think that you are
going to earmark just $25,000 to develop a systems approach to business
and office education. You are not; system development is long, tough
work.

I will not give a specific example of business systems approach.
You've seen it. Dr. Morrison gave one example last night. He used the
systems approach in the development of the Quincy vocational curriculum.
Geary Rummler gave a specific example which includes the systems approach
in development of the training method for reservation girls at TWA. Let
me talk about systems a little more abstractly than they have.

Here is a curriculum (Dr. Wilson pointed to a system model proposed
for the talk), there is an output in which we talk about performance
measures for terminal behavior. I think this is the way both Canfield
and Morrison spoke of it. Here is an input, "students," which is es-
sentially the thing that Dr. Balsley keeps questioning. "What are the
capabilities of the students?" And she keeps asking the question, "How
do you get a measure?" The process that converts the initial behavior
into the terminal behavior is called essentially the educational system.
I guess, from just reading the planning proposal, it is a sequence of
elemental construction modules. As I think of it, the modules could be a
set of a linear sequences of some set theories, some number theories,
some information, knowledge and techniques for operating machines, how to
run a lathe, some work on materials, and so on. These make up what I
have labeled "subsystems" within the curriculum modules.

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Now, let me go one step further. It is necessary that you measure the performance at the end, and it is necessary to have a feedback loop for making changes in the curriculum. But suppose that we were to pursue this systems approach in developing a curriculum to see what it will look like in five, ten, or fifteen years. What would we be doing in addition to stating performance characteristics? Well, if what has happened in other areas is any indicator, here is what we will be doing: We will be able to make a statement like this, "Here is a learning module that has several characteristics. It has subject matter content, it has a method of presentation, or a medium, I think you call it, and it has a length of time." If you pursue the systems approach some years in the future (and by the way, it won't be next year that we will be able to make such statements) you'll be able to say, "If you change the length of time of this particular elementary module from 20 minutes to 15 minutes, the time change will have the following specific effect on the terminal behavior, a scale against the length of time of learning module No. 7 in the curriculum and how it affects the terminal performance. These kinds of data about the relationships of each one of the learning modules to overall terminal performance are what you will have if you pursue a systems approach. You will also have some understanding about the interactions between two modules or pairs of them. I think most of the curriculums that are developed are done so on the theory that the modules are independent, or so Mr. Rummler tells me. I suspect, however, that you will find that they aren't independent, especially with respect to all students. There is some interaction between modules, and if we pursue the systems approach in the development of curriculum, we will understand these interactions.

A word about the differences between the analog and mathematical model. A medical researcher using a guinea pig says, "Here is a system that is similar to the human being. In my experiments on the guinea pig, as I observe the results in the model and insofar as the model is like the human being, the conclusions are valid for human beings." The model could be either analog or mathematical, and I don't know which would be most appropriate for education. I am not saying mathematical. But here is the next point that I wanted to make. This is a curriculum (points to illustration) following a systems approach. The approach allows us, say in five years, to be able to compare alternatives. We will be able to compare two curriculums and determine essentially which comes closer to meeting the desired terminal behavior that someone has agreed is desired from an educational program. In other words, the ability to compare alternative proposed curriculums is one of the capabilities that we pursue systems analysis.

For example, the air force is very good now at making comparisons between two proposed fighter aircraft they are using in Viet Nam. They are very good at making these comparisons, by the way. Fifty million dollars a year for fifteen years gave them the capability, don't forget, but they are excellent at it. I might say in this context, if we were to ask, "Suppose we take a particular fighter aircraft and put it in action in

Viet Nam. Suppose, further, that we give it this kind of a mission. What is the probability of its survival?" That, by the way, is cal- culated in the air force today. You send the fighter over today; you do the mission tomorrow; and the accuracy of that prediction is within 1 percent.

How has this high degree of accuracy been attained? In the States, the air force has a model of the process of the environment in Viet Nam, the air force and its performance capabilities. The air force has de- veloped the model of the process by collecting all data on the process. In education, too, all data of the system process will have to be collected. Why? In order to build a model of the educational process so that ex- periments can be run on the model without going out to the real class- room and students for every new idea.

Thus, we must move further in developing models of the educational process. We must experiment on the model in exactly the way a doctor uses a guinea pig or the monkey when he runs experiments on the circula- tory system. Then, we can use results of the experiments on models to predict that when making given changes in the curriculum, the changes made will produce such changes in the performance capabilities of student outputs. So the development of the model for business and office educa- tion process is going to be a long, long task. Based on experience in other areas, I don't think that you will have one that will be very good for at least ten years. You are not going to say, "Well, let's develop the system tomorrow." And it is not going to be done for just a few million dollars. It is a tough problem.

We can certainly learn a lot from other people who have developed systems in other areas. I think I would look into the educational de- velopment programs that the military has. I'd look at the military train- ing program and the models that have been developed from military train- ing programs. How do they train technicians? How do they train super- visors for radar installations? These jobs are really complex but not different from those in the business offices. Thus, because the military services have had lots of money to develop systems, I'd attempt to go there first.

As you can see, my reaction to the words "systems approach" in the "Moonshot" planning and feasibility study is that this group probably doesn't really appreciate the difficulty of developing a system.

Now, there are a couple of other points that I want to make. The next point is that an educational process for producing students who can get jobs and maintain jobs in the business offices exists in an environ- ment. I think you talked about this environment, and it is essentially the business office. There is an environment which is exclusive of the office environment; it is not independent of what is required. Essentially, it is the student population from which you pick students to put through

the curriculum. For example, changes in the characteristics of the students will require that changes be made in the curriculum. It may be, for example, that your curriculum may include a module on teaching sets in arithmetic. Due to changes made in the fifth grade, though, all students may be learning sets. So you take instruction on sets out of the curriculum and don't repeat it; or at least you may want to modify it. So that is how the environment in which your curriculum has to operate affects the curriculum.

I am still reacting to your proposal and ideas I have received from it. In considering the changes in the business office, the technology that is used there, the method of operating, the management skills that are used in business office; these changes are certainly going to feed back into the system and affect the curriculum. We might think of these office requirements in two categories: (1) In the proposal you call one category the "job entry skills." I define job entry skills as those skills that primarily have to do with manual dexterity. These are es- sentially the implementing or the technique of performing a function in a business office. (2) The other kind of skills that are involved, I have labeled "adaptability skills." Those are the kind of skills that give the student the ability to maintain a job, to retain a job under conditions of changing technology and development in the way a business office operates. So one feedback loop is really the changes in the re- quirements for job entry.

It may be and it looks like it will be a very few years before some of the typing may be obsolete as a job entry skill. I think maybe that is a poor example. Let me give you one that is really going to be ob- solete as a job entry skill, although it is a very high priority on the list of needs now. That is keypunching. Keypunching is probably one of the most popular types of things that can help students get a job today, and within five years it will be obsolete. So changes in job entry re- quirements for job entry skills will affect your curriculum.

Another feedback loop from the business office will be changes that take place in those skills that are required for a person to maintain a job or to adapt to the changing business office. These changing skills are a little fuzzy and I am going to spend some time this afternoon, hopefully with my panel, talking about them. I have gone through your proposal very carefully and listed everyone of the characteristics that you have said a student must have if he is going to be adaptable to the changing business world. I want to ask how you are going to build a cur- riculum that produces adaptability behavior in students.

Let us summarize the way the curriculum can change: one is that the student population changes; one is that the business office charac- teristics change either in the job entry skills required or the adapt- ability skills needed. What do we measure? We have to measure, es- sentially, the percentage of people who, when they come out of this pro- gram, get their first jobs and those who don't get one. These two

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measures together help you decide what changes to make in the curriculum.
How many people get their first job in a business office but are un-
employed a year later? We have to learn how to measure those that can't
retain a job; we must keep records on retention because that is an im-
portant feedback loop for helping us decide how to make curriculum changes.
I have listed four types of changes that one has to account for in the
development of the business office curriculum and what has to be measured
and fed back from the business office in order to develop curriculum
that produces a student that can get his first job and maintain his job.
I guess if I had read John Gardner's book before I developed this chart,
I would have recognized the self correction of business office education
curriculums. I think I would call this "self renewal," because that is
what I have tried to take into account.

How do we keep adjusting and changing the curriculum? In engineers'
jargon, we say that the environment is not stationary and we must adapt
to changes: we must measure what the system is doing and adapt to changes.

The military has accomplished this. They keep testing the environ-
ment in which their military systems operate and feed these environmental
tests into their model of operations, thus deciding how to adapt the mili-
tary systems to maximize their performance.

Just a side comment, the Michigan-Ohio Regional Education Laboratory
built its last proposal to the U. S. Office of Education on the very con-
cept of self-renewal. Well, self-renewal appears in your first proposal,
too. It isn't developed and doesn't really go far enough. The words
appear, but I believe that for the continuing project I would certainly
want to develop the idea further.

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APPENDIX D

NOTES ON "MOONSHOT" - PROBLEMS AND SUGGESTIONS

F. Carpenter, The University of Michigan

I. Choosing among alternatives for developing the system. It may be profitable to consider different approaches that can be used for making the product. The final choice may be important because it relates to uses of available resources (budget, etc.). The three main approaches that occur to me are:

A. The de novo approach which means that minimum concern will be paid to the strong aspects of current programs. Instead of borrowing what may already be usable in existing curricula, we plan to start from scratch and build an entirely new system. Adoption of this approach implies that the project will have plenty of money, time, and available manpower to do the job. If it appears that any of those resources may be somewhat limited, choice of another alternative seems advisable.

B. A second approach would be to select several existing systems that have high success indices, as measured by acceptance of the graduates on the vocational level. This approach offers freedom to enter, study, and modify these systems which may reduce time and effort to complete the project in comparison to the first approach. A second advantage may be found in rapid assessment of the adaptability of new components within existing systems. A third advantage relates to marketability. By demonstrating that the program is a definite improvement over current programs rated as exemplary, the reaction is likely to be quite favorable by prospective users.

This alternative would involve an intensive initial survey of business education programs, and then rating them as carefully as possible in order to choose a sample of exemplary programs for the purpose of improving them via the systems approach. (Some remarks by Morrison can be interpreted to support this alternative.)

C. The third alternative may be called the "piecemeal demonstration plan" which attempts to examine the comparable values of the new components with their existing counterparts. Marketing is a main concern here because the aim would be to provide customers with a choice of buying the whole system or any of its units, any single package being made to work in the traditional system. Various curriculum packages would be developed simultaneously in different schools and tested centrally to fit into the total system. The idea, as it appears on paper, seems to have certain economic advantages. Yet, it presents a challenge to the system makers because it means that not only the entire system must have general utility, but that each of its sub-systems or components can be adapted profitably to existing systems.

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My own suggestion is to choose the second approach because of promised economy and hopefully its demonstrated superiority over programs now considered as outstanding.

II. The problem of "too much success." Is it possible that success of the project may actually create problems on the vocational level? This appears, on the surface, as a most inappropriate question, but let us consider a probable outcome. Assuming that all graduates of the new system will acquire more than office skills taught in traditional programs, that they will learn the nature of the business enterprise, its purposes, functions, and relationships, what psychological climate is likely to result between the brighter graduates of the new system and their immediate on-the-job superiors, who are not used to such erudition in the subordinates? It seems likely that the modestly bright new graduates will have a better grasp of the total picture than most of their clerical bosses. They may appear to be upstarts without even trying. Unless this probable result is anticipated and provisions made in the system to cope with it, the success index of the program may be less than it actually merits. Since this is not an unlikely outcome, it implies that appropriate provisions be made in the form of a coordinating sub-system between executives in the hiring offices and the training system. It may even require the introduction of an orientation program that will help the hiring offices best utilize the talents of the new graduates which mean that the degree of utility of the product of the new system may depend upon some education introduced at the vocational level (in hiring offices), particularly for clerical bosses from the old school who are not themselves executives.

The amition of Moonshot is to create a new population of abilities in the behavioral repertories of clerical workers. It seems that the new additives will overlap with the repertory set now held by junior executives. Theoretically, this should provide for better communication between executives and non-executives. But we should be prepared for another influence of the program that has apparently not yet been anticipated. Namely, that the new curriculum will likely raise the aspiration level of the brighter students, who, because of their increased comprehension of the business enterprise, may not want to terminate their schooling at the high school level. The program may inspire them to attend junior colleges, community colleges, and special business schools in universities. This likely outcome would require the modification of the success index of the new system to include the percentage of graduates that elect higher education.

III. Problems of adaptation training for students.

A. The possible disparity between the pattern of habits best suited to adjustment to the training system and to the vocational environment presents one problem of adaptation training for students. Successful adjustment to school does not guarantee successful adjustment to the world of gainful employment. Theoretically, one advantage of the systems approach in curriculum building is that the self-correcting devices may be used to bring the demands of training nearer to the demands of post-training environments. One of the main psychological problems involved

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in this consideration is that successful adjustment, in large part, means learning how to cope with stress. Consequently, it seems logical for the planners of <u>Moonshot</u> to make special preparations for dealing with this problem. Selection of training procedures to improve flexibility of adaptation to the normal range of office conditions in the field should probably include:

1. Various simulation techniques such as mock-ups of offices having different kinds and degrees of stress. The idea of training for adjustment to stress appears quite profitable as suggested by inspection of military training programs. (Example: Extra demands of bosses irrelevant to job skills.)

2. Simulation by game techniques.

B. A second problem involving adaptation training is implied by this question: How much information on individual students should be available prior to entering the program? If flexibility is one of the main concerns of the program, that is, the intent to train the student to have desirable flexibility in certain situations, it seems likely that some kinds of rigidity of students may prove uneconomical to overcome by the system. If so, then it seems advisable to explore the available field of measures of various forms of rigidity or to abstract the symptoms empirically. Although <u>Moonshot</u> apparently cannot indulge in the luxury of screening students to the point of picking only the cream of the crop, it seems wise to identify, if possible, those characteristics (habits) in students that promise to resist change in ways that are desired. While only an empirical examination of the problem may solve it, the idea is that information about likely parameters of individuals concerning flexibility may prove quite useful. A practical residual value could occur in adopting this suggestion by providing valuable information to school counselors.

C. A third problem in this area, closely related to the preceding one, is the task of finding other pretraining correlates with patterns of success under various conditions of training. I think that this consideration is closely related to the main criterion for judging the success of any educational system. The value of innovations in modern schools must be judged, in keeping with the temper of the times, by the extent that certain changes demonstrate successful accommodations to important individual differences related to learning effectiveness. I have seen a number of new creations of educational technology that are hardly more than expensive toys that serve mainly to disenchant students, teachers, administrators, and the public. It seems important to have sufficient (pretraining) information on students so that cluster lanalyses can be accomplished that will eventually provide predictive data on optimal paths

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[1] See Professor M. Clemens Johnson for further details.

of the teaching-learning maze best suited to particular kinds of students. Opinions differ radically on the amount and kind of pretraining information needed to achieve that end. Some say that only a minimum of entry behavior is required to judge where the student should begin the program, and that the student will provide all the other necessary information by the way he behaves during training. But others have disputed that position. Their work (for example, McKeachie's) indicates that decisions on how to alter the psychological environment seems to call for somewhat extensive information on the student himself. The promise seems to be that considerable knowledge of the student concerning his habits, values, inclinations, interests, and the like may improve the efficiency of decision-making in altering the system by reducing some of the cut-and-try procedures that would otherwise be used. Assuming that this is an important consideration, the practical suggestion boils down to this: somewhat extensive descriptive data should be gathered on students of both cognitive and non-cognitive kind and the data then be subjected to cluster analysis to determine patterns that can be conveniently related to success and failure at various stages in the program. The kind of preparation and practice may prove to obviate some of the costly trial and error procedures which are likely to occur in the absence of such information. (Example: program vs. aptitude data)

IV. <u>The problem of teacher educator--regular teacher subsystem.</u>

A. The first problem that is likely to occur in this subsystem is the lack of rapport between the teacher educator and the regular teacher. Because this system is designed to place the teacher in the position of decision-maker in determining the selection of alternatives open to the student, the teacher who is learning to make those decisions must be kindly predisposed toward the new system. If the situation comes to be aversive to him, he could wreck the whole system. Consequently, some in-service preparation in the way of carefully planned orientation procedures should be considered. Careful selection of the teacher educator also seems important to avoid a personality clash between him and the regular teacher.

B. A related problem is the task of getting information on the regular teacher that can be used to estimate his success in adjusting to the new system. Explorations in this area are recommended with perhaps some consideration given to getting certain noncognitive measures that logically apply.

V. <u>The need for a placement bureau.</u> The fifth problem is indicated by the absence in the systems diagram of a needed component, namely, a placement bureau which could be used to gather information on both graduates and characteristics of the various vocational environments among which they may choose. The problem of matching applicants with offices may be needed to insure a high success index. The range of working conditions and psychological atmospheres among offices is no doubt somewhat broad. When the market favors the applicant, he should be given help in making a choice by providing him with more than the usual kind of data. Psychological matching requires information on the office as well as on the applicant.

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VI. <u>Problems of assessing student performance</u>. Since <u>Moonshot</u> seems to parallel the Quincy, Massachusetts project rather closely in its demands for evaluation of achievement, I would like to raise some extra considerations that are not indicated in the Quincy proposal.

One consideration is the task of choosing and maintaining useful cumulative records of performance during training. It seems advisable, whenever possible, that continuing records of learning be established in the modules so that relationships can be inferred between how the student behaves and changes in the instructional stimuli. That end is fairly well accomplished when proper management is applied to programmed materials. But the challenge of invention seems to arise because techniques do not seem to be available for use in all situations that seem both desirable and possible. The programmed instructional paradigm, however, may help serve as a model that can be approximated through inventive measures. The important value of good cumulative records of performance during learning is that a fine-grained analysis is made possible that can serve as the basis for making useful changes in the instructional situation. A guiding principle, may be to maximize the establishment of cumulative records of performance with associated changes in conditions; and when either-or choices must be made, to choose in favor of the cumulative record as perhaps the best criterion for assessing the effect of modules on individuals. Another suggestion along this line is to explore the utility of the technique of interaction analysis (Flanders) and examine some of its possible modifications.

EPILOGUE

After listening to other speakers on the program particularly Morrison and Canfield, I think that the building of effective instructional systems must involve a strong emphasis on the teacher variable. As Canfield indicated, the psychology of the teacher cannot be ignored. Unless successful effort is introduced to modify the habits and inclinations of teachers that are incompatible with the system, then the teacher is bound to behave to create costly noise in the system. Canfield's reference to Professor Postlethwaite's outstanding success in raising the achievement level of his students with only modest facilities, including some crude equipment, is a strong testimony to the strength of the teacher variable. Since <u>Moonshot</u> defines the teacher's role as a central decision making agent, it becomes vital to have teachers properly trained to operate in the system. I am now inclined to think that the teacher variable is so important that, in general, the building of educational systems should <u>begin</u> with teacher training; that is, by first making a system devoted to the training of teachers in the understanding and operations of instructional systems. If only a cursory treatment is given to this important problem, most of the effort is likely to be wasted.

A second important modification may be a tough one to make at this point because so much effort has already gone into the development of the project along certain lines. The suggested modification is initiated by

the question: What should be the nature of the first proposal that will
maximize the probability that it will be funded? The main handicap so
far is that so much work must be done in such a short time. Consequently,
it seems likely, despite the apparent importance of the project, that
the time pressure may prove too much of a handicap unless some careful
thinking is done to obviate precipitous decisions. The first step is to
consider the great complexity of the project and the amount of time,
effort, and special counsel needed to develop it properly. I think that
the project's complexity is obvious to all concerned, but the desire
to produce a fundable proposal in such a short time could easily result
in the omission of important details from the standpoint of the reviewers.
More time seems to be needed to write the most defensible proposal. How-
ever, because the time factor is such a serious restriction, careful
thought' must be given to choice of alternatives open for making a pro-
posal that is most likely to get funded.

My suggestion, under these circumstances, is to aim for a pilot in-
vestigation as the first phase so that decisions concerning later pro-
cedures can be made on more than simply educated guesses. Yet, the
pilot study must be seen as an integral part of the whole package. My
suggestion is that the pilot study be largely a fact finding operation
to determine the economy of the various approaches. Before the group
is finally committed to an approach, it should be fairly clear that suf-
ficient groundwork has been done to show that the chosen approach will
promise to be the most effective and economical among the alternatives.
Because of the size of Moonshot, it is reasonable to initiate the study
by a careful examination of the possible routes that lead to the goal,
and to be able to show that the chosen route is the most feasible among
those that are available. Consequently, I suggest that the initial phase
be addressed to the examination of current curricula in business educa-
tion for the purpose of identifying the most effective and usable com-
ponents that now exist. Secondly, an analysis be made of those compon-
ents to be accomplished to show their relevant and weak points in re-
lation to the demands at the vocational level. Also, a study needs to
be made to describe the changing demands in the office world so that the
new curriculum can mesh with those demands. I would suggest that a later
phase be used to develop the details of the systems approach after proper
analysis has been made of the necessary facts that describe the status
quo adequately. The suggested sequence of tasks in the initial proposal
should probably show the following order:

A. A study of current demands of the business world to estimate
the rate of change in those demands and to clarify the lag between them
and current curricula.

B. A survey of exemplary programs that already exist. Because the
de novo approach appears to be unnecessarily costly, it seems wiser to
know in detail how adequate the best current systems are and attempt to
improve them rather than starting from scratch. (Morrison has already
indicated the unfeasibility of making all materials by starting from
scratch.)

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C. A survey of the management techniques of exemplary programs to determine the ralative effect of management vs. content. I have ob- served directly how expensive systems can fail, even when they have good equipment and materials, by inadequate teachers and management. The importance of this part of the initial survey is to get some estimate of how much the Moonshot system should address itself to development of managerial techniques of the learning environment and how much it should emphasize alternation in content. The latter concern (modifying content) is best judged as the result of "A" above.

D. At the conclusion of Phase I, which would include the above steps, the builders of the proposal should supply the design of the Moonshot system.

I am inclined to think that the adoption of the above plan or of something similar will not only reflect that the architects of Moonshot have considered the vastness of the task and have not been stampeded into making precipitous judgments largely for the purpose of gaining a hugh grant, but that they have adopted an approach that reflects that their primary concern is the making of a significant contribution to the field.

The main principle that I've tried to reflect in this counsel is: the success in completing complex projects is best insured by breaking the large problems down into researchable parts. If the Moonshot pro- posal fails to convince the reviewers that the proposed action accords with the principle, its future will be rather dark.

APPENDIX E

CONSTRAINTS IN DESIGNING MOONSHOT

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I have eleven points to make about constraints that must be observed in designing Moonshot. They may not all be valid, but I hope that you will help me revise and add to them:

1. One constraint on the research project is that we must be concerned with business and office education, vocational education, and I think most everybody accepts that. It is very important that the members of the business education study committee be sure to discuss this with people over the nation because some of these people may think we are too narrow. Our limitation to vocational education was caused by practical concerns, i.e., funds are available for research and demonstration here but not so certainly in the general business or economic fields. We ruled out distributive education because most of the initiators are specialists in business office education.

2. The second constraint is that we are emphasizing, as well as the manipulative skills in our field, the thinking part of office education. In other words, we are trying to conceptualize our field as something that makes a contribution, for example, to business and office information processing. We are trying to define our field as a major part of the American economy, something that maybe we are giving lip service to now. I hope that we can get thinking into our research and development project; I hope that we continue to recognize that we are dealing with an area of information processing in this particular project.

3. The third constraint is also one that people in the field will want to know about: Our immediate target in Phase 1 is the high school, 9th through 12th grades; other levels will be considered later. The rationale behind focusing on the high school (grades 9-12 first) is that this area is where the major segment of our business and office education student population is located at this moment in time.

4. The fourth constraint recognizes that roughly 75 percent of a student's time will be outside of our field. This constraint means that when we talk about educating the student, we recognize that there are other aspects of the educational program that will have impact on students. In other words, we want to turn out a citizen, a self-actuating person, from our schools. Business and office education doesn't and can't do it all. We are going to recognize that the other part of the secondary school program makes a contribution.

5. The fifth constraint relates to instruction. Materials must be flexible to fit the present system of schools. Yet materials must be flexible enough to adapt to changes in schools. In other words, we assume that we are going to develop materials for present school systems but change as school systems change.

6. "Moonshot" will be concerned with all boys and girls that are high school level and particularly those of average and lower than average aptitudes and achievement. So this constraint recognizes that we will be dealing with all kinds of boys and girls, but we must be concerned particularly with the average and less than average.

7. We must recognize and temporarily screen out boys and girls who aren't ready for the program. If the reading level is at the third grade level and the arithmetic fourth grade, perhaps we don't have any business working with them. Perhaps for their sake, these poor readers and computers should develop these skills to a point that they can profitably follow our programs.

8. Another contraint is the classroom teacher and his concept of himself. In the United States we have 60,000 or more business and office teachers, many of whom are teaching subjects we are proposing to change. We must be concerned that we develop marketable materials, materials not too out-of-line with concepts of present teachers.

9. Contraint nine relates to the current status of business teacher education. It certainly doesn't apply to the people here, but many teacher education programs in our field are insulated from the firing line. The teacher on the firing line and the city supervisor on the firing line get great pressures to make changes, and I am making an assumption that teacher education people are back a step from that. They don't feel the pressure as much. We must recognize the current level of teacher education as a constraint but recognize it as one we hope can be moved.

10. Number ten is a constraint due to concepts held by school administrators. It is their concept of what our field is. I am sure we have a job to educate them, but I am saying that their concepts are a constraint.

11. Number eleven is a constraint due to the concepts held by school counselors on what our field is and what we can do about it. I am sure that there is an enormous constraint on us because no matter how much we talk, how much we tell them that business and industry can use all levels of abilities, they seemingly don't listen. So, I think counselors' concepts are a constraint.

Question: All these are constraints within our profession and nothing from business. Now, do you feel there are no constraints so far as the business world is concerned?

Answer: That is a good point. I think that we are limited frequently. When we make surveys of what the duties and activities are, I think we get a stunted picture from many business people, a very stunted

picture of what goes on. If you do anything like using a term "systems analysis," you find that they don't really know what goes on in their businesses. They don't know what goes on because they haven't made an analysis. So, when businessmen tell us what they require, they are basing their requirements on a very limited picture. So I think it is a good point.

Question: Are you suggesting then, that we add a twelfth constraint--a constraint of business demands? For example, typewriting?

Answer: Yes.

APPENDIX F

ESTABLISHING PERFORMANCE OBJECTIVES--A CASE STUDY

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The University of Michigan

Chicago, July 30-31, 1967

I'm concerned with the problem of establishing terminal behaviors
or performance objectives. I want to explain to you what we do in the
way of analysis that leads to the statement of objectives. Later, would
you react on how you think our system will work, will not work, and
what really has to be done to implement such a course in Moonshot?

I'm going to describe to you very briefly how we attack a problem.
I'm presenting to you, not relating directly to Moonshot, how our group
at the Center for Programmed Learning attacks performance problems.

Briefly, here's a case history of how we look at a performance prob-
lem. Specifically, TWA contacted us earlier this year about a four-week
course they use at Kennedy International Airport for reservation agents.
Reservation agents are the girls that sit all day, taking calls from ob-
noxious travelers, trying to get them on the right flights, and answering
all their questions. When you call an airline, you will probably be talk-
ing to one of the eighty reservation agents in your area, sitting in a
long row similar to an assembly hall; just sitting there taking calls all
day. The job is a very complex one, requiring four weeks of basic train-
ing. TWA was interested in reducing basic training time considerably be-
cause the cost to them is in the neighborhood of half a million dollars a
year in per diem. Thus, if they could cut the training from four weeks
to three weeks they would save $125 thousand in per diem costs. You who
are connected with Moonshot aren't in the kind of situation where that
kind of dollar value can be placed on students. Our feeling is, however,
that the student unconsciously has a dollar value on his time as he's
sitting through a course of instruction.

In looking at our task, we set out not necessarily to change the
course or the curriculum. Our first step is to look at the job and see
what is involved. Forgetting about training and how we are going to
propose doing the task, we look at what people actually do. We visited
a number of different reservation offices around the country, talked to
and watched reservation agents (two of our people learned to be reservation
agents), sat at the phones, completed flow charts of every major decision
a reservation agent has to make. Seven or eight tariff manuals, we found,
had to be referred to with seemingly infinite number of combinations of
schedules that passengers can make.

After we discovered what the job was, we talked to the management
and talked to the training people of the organization. More importantly,
we tried to find out how the job really should be done, tried to identify

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the 15 or 20 percent of the tasks that workers do incorrectly or that
management wished workers would do differently. Thus, we made an effort
to find out what the job should be, what it is now, and then tried to
figure out what the tradeoffs were to be. The reservation agents can do
several things for the company after they have gained experience. They
can become what are called "Agents," a kind of super-agent, who walks
around between the rows and handles difficult problems; or they can be-
come a supervisor. Again, we had to find out what the line of pro-
gression was, what skills were involved, decisions involved, and what
the most common types of deficiencies of people were.

What comes out of this kind of analysis with our doing the job,
observing all people, talking to supervisors about what are the three
most common deficiencies is a series of documents. One is a complete
chart with the major decisions a person performs on that job and what
they do. We end up with a list of terminal specifications or performance
objectives for every subpart of the job, which basically says, "Given
a telephone call of this type, the agent will be able to handle this
kind of call correctly within a certain number of minutes." We've also
come up with a third thing. First we have what the job is; second,
the terminal specs, and the third thing we've come up with is what we
call "consequence of performance analysis." For example, management
say, "He should be doing these things," when people are doing this. (We
tend to err in the direction of the person who is doing the job). If
he's doing it that way, there is a very good reason why he's doing it
in that particular situation or environment. For example, company policy
says that when a customer calls, the TWA reservation agent should try to
sell that customer a tour of the city. If one is going to Chicago, the
agent should say, "Did you know that when you're in Chicago you can get
this kind of tour?" That's what company policy says.

We talked to the girls and they said, "Do you see that big board up
in front that looks like a football scoreboard with those little red
lights? Those blinking red lights are the number of calls that are on
hold that no one is taking care of. Then, there is my performance evalua-
tion sheet containing the number of calls I handle per hour, per day,
and also the percent of sales I make. Now you don't think I'm going to
stay on this phone and talk an extra two minutes to someone to sell him
a tour which isn't credited to my record, do you?"

Thus, given the desired behavior we want, then what happens if the
worker does it or not in terms of dollars, supervision, or any other
variable? In other words, we find out why the system is the way it is.
Then we talk to management saying, "Our advice, sir, is to change your
policy and you'll get more out of the real world." That's a third kind
of major document that comes out of this analysis.

Thus, in our procedure, we have concentrated on performance, we've
identified deficiencies, and we've tried to locate whether the deficiency
can be corrected by training or whether, in fact, there's a whole pro-
blem of the environmental control.

Now comes the more difficult job, i.e., how to design a course to attain the specs. The course that we've designed for TWA cut the training to less than two weeks and did that by a number of decisions by our staff involving some consideration of learning principles. Let me describe the kind of decisions that are made at this point: One of the tasks that a trainee has to do at TWA when she takes an order is to fill out the sales order form and put it on a conveyor belt going to the bookkeeping department. To teach this task required approximately eight hours in the present system at about the third week of training. Our people took a look at the situation and decided that filling the sales order form was a terminal behavior that the sales agent goes through at the end of every task. That is, almost every task that she does as she makes a sale, ends in doing this kind of behavior. Why not teach it very early, say the second day? We don't have to teach it in great detail because we will now use the sales form as the major form of response for all training for the rest of the week. As we teach the use of the telephone, we teach trainees to use the manuals and we will always say, "Now that you've done this task, fill out a sales order." So it takes something less than an hour to teach the rudiments of a sales order early in the course design and it is reviewed through continuous use. That was one decision which changed an eight-hour task to a one-hour task.

Another example is that we want to emphasize selling because reservation agents are really sales people. We should start early in the four weeks teaching them how to sell and the importance of selling. We ended up making selling the last three days in this design because much selling behavior is merely talking on the phone, and these are behaviors that people already have. Looking through four different manuals and calculating rate structures is a very difficult and very foreign task to agents, so the decision was made to teach the manuals early without introducing the phone which is an interferring behavior. Bring this skill up to strength and finally get agents on the telephone where again they review the practices. These are the kinds of decisions made by people who call themselves behavioral technologists in education.

This program is going to be piloted before it's to be implemented and there will be a lot of feedback on the decisions we made. There will probably be some further jockeying around before the course is finally implemented, but our best guess is that at this point we have the most efficient and effective structure that we can make and it comes about from having done particular analysis of job tasks.

We've done the same kind of thing for sales training, the area of teaching salesmen for a large, multi-division company to sell. The same type of analysis was done for the ATT first-aid project just completed, which shrank first-aid training for ATT from a day and a half to $7\frac{1}{2}$ hours. Right now we're doing a project for hospitals and trying to develop a curriculum for training surgical technicians, scrub nurses, and people in the operating rooms. I have a brochure here that discusses it ever so briefly and is, in fact, pictoral evidence of what we do.

ATT had the same dollar problem which is how we prefer to work with problems. ATT is the only company in the nation to do their own first-aid training and to certify instructors. The problem was they trained 3000 people a year in first aid and it took about $1\frac{1}{2}$ weeks. They finally cut it down to 10 hours. They said 10 hours was as useless as 16 hours because that's another day off the job. They estimated the cost and if they could get the first-aid training down to less than a day and a half-million dollars would be saved in a year. With that they gave half that to American Institutes for Research to do something with and it's a beautiful project. Basically what AIR did was design the performance objectives and a way to evaluate performance. They gave that test to people who had been trained in the other system and to the people who had gone through the new system. They did not get any overlap.

TALENT INVENTORY

I D E N T I F I C A T I O N

Statement of the Problem

The construction of a massive curriculum research, development and dissemination project involving the total field of business Education (such as NOBELS) required the identification of appropriate personnel. Personnel that should be involved. No comprehensive data were available on the number or talents of potential participants. Consequently the identification of this potential talent was made a part of Moonshot. The Specific Procedures in the Moonshot feasibility proposal discussed the three facets involved in identifying appropriate personnel:

A. Development of a roster of selected personnel: state supervisors, city supervisors, ity supervisors, business teachers educators, and others.

B. Securing talent data by means of a mailed instrument: (See pp. 65-66).

C. Development of a computer program for analyses of the talent available for NOBELS. (See page 68 for a sample printout).

Significance

Curriculum innovation must have the support of the decision makers within the effected discipline. A calculated procedure for securing such support is the direct involvement of these decision makers in the proposed curriculum project. Furthermore, the proposed Talent Inventory of appropriate decision makers would provide the additional advantage of a vehicle for dissemination of information concerning the project at each phase. Finally, it would provide comprehensive directory of the talent currently available for other professional projects.

Purpose

The major purpose of the Talent Inventory Sub-contract was to determine potential participants in any future phases of NOBELS as well as their unique talents and willingness to participate. The specific objectives of this purpose are:

1. Compile an initial list of potential participants.

2. Develop a talent data collecting instrument.

3. Develop sources for the collection of talent data.

4. Develop procedures for processing and analyzing data.

5. Develop a directory of personnel available and/or interested in working on the project.

6. Report to the Delta Pi Epsilon Board of Governors and other appropriate agencies on the results of Part 1 of the talent operation.

Methods and Procedures

For each specific purpose, a specific procedures was utilized. These were:

1. The initial lists of potential participants were secured from the OO-TEC (Office Occupations-Teacher Education Clinics) files.[1]

2. Key punch mailing address and code by level (business Teacher Educuators, State Supervisors, City Supervisors).

3. Machine run by institution within the state.

4. Write an explanatory memorandum about the project to the state supervisors requesting data on appropriate personnel in their state.

5. Mail the complete run by four-year degree granting instututions within the state to the respective state supervisors for additions and deletions of those institutions certifying high school business teachers.

6. Write cover memorandum about NOBELS to these institutions to secure:

    a. additions
    b. deletions
    c. identification of the department chairman
    d. doctoral program, and if so, a list of their doctoral students
    e. other potential participants at their respective institutions.

PROCEDURES

1. The initial lists of potential participants was secured from the OO-TEC Files.

2. Concurrent with the development of the up-dated lists, the Talent Inventory instrument submitted to the USOE with the original proposal was field tested and revised three times. Prior to the second field test, the instrument was reviewed by the members of the profession at a special meeting. This instrument was sent to Washington, D. C., with a form SS-83 (Supporting Statement for Extra Mural Research Projects) for approval. Attached is a copy of the instrument.

3. Because of the limitations of time and cost, the total identification project was divided into the following phases:

    PHASE I
    Field test in Michigan
    Refine and use in Michigan

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[1]Project #6-1522-1-32U. Department of Health, Education and Welfare, Office of Education, Bureau of Research, Division of Adult and Vocational Research; Project Director, Dr. Fred S. Cook, Wayne State University, 1966.

PHASE II
    Refine the instrument and use in North-Central Region as defined by
    the North-Central Business Education Association.

PHASE III
    Use the refined instrument to collect data nationally.

    The following is a brief description of each of the specific methods that were
utilized;

    1. A mailing was sent to 54 supervisors of the fifty states, three terri-
tories and the District of Columbia under the sanction of Mr. S. Greer, President
of NASSBOE (National Association of State Supervisors of Business and Office
Education). The mailing contained the names of all known schools with business
teacher education programs, the names of Business Teacher Educators, as well as
State and City Supervisors of business and office education. The respondents were
asked to make additions, deletions, and to add the names of any schools not listed
on the printout which certified one or more business teachers per year. While
the returns were somewhat delayed, the response was 100 percent.

    2. Concurrent with the developmnet of the up-dated lists, the Talent Inventory
instrumnet submitted to the USOE with the original proposal was field tested and
revised three times. Prior to the second field test it was reviewed by members
of the profession at a special meeting. This instruemnt was sent to Washington,
D. C., with a form SS-83 (Supporting Statement for Extra Mural Research Projects)
for approval. Attached is a copy of the instrument.

    3. At the time returns were being received, a list of the total population
of colleges in the United States was coded. The object of this list was to insure
a detailed printout, if required, of this information while keeping the instrument
data to a maximum of four punched cards.

    4. The field testing of the instrument and subsequent revision reduced
the time required from 35 to 45 minutes to 4 to 6 minutes. This substantial
reduction in time, while maintaining all of the pertinent questions, was
anticipated to increase the response by at least 15 percent. The revised
instrument was set in hot-type to produce the highest quality possible in the
final instrument. Enve,opes were also imprinted with the word Moonshot and the
USOE Project Number in a further attempt to increase the response.

    5. Although the Center for Research and Leadership Development in Vocational
and Technical Education held the subcontract for Dissemination, it was felt
that a greater response would be achieved if materials were included with the
Talent Instrument. Therefore, the instrument together with several articles
published in Business Education World and the Journal of Business Education were
sent to acquaint respondents with the project. Because it was anticipated that
NOBELS would continue as an on-going project in Business Education, no cut-off
date for receiving instruments was established. Consequently, late returns may
be included in future printings of the directory.

5. The most difficult problem in the identification subcontract was the development of a format for reporting the data; because of the total number of respondents anticipated, a one-page format was not feasible.

CONCLUSIONS

The following conclusions were derived from the study:

1. The returns have been 921 or 51.7 percent out of a total of 1780 mailed instruments. A departmental questionnaire was also included to obtain the names of doctoral students if the particular school had a doctoral program as well as other potential participants at that school, not necessarily business education From this questionnaire, 447 new names were obtained; of this total 237 or 53 percent of the new name returns were recieved.

2. The final format developed is an alphabetic directory. Attached is a two-name sample from Michigan. There is also an index, which indicates the page the individual's data appears on.

3. Phase I has been completed as far as data collection is concerned. Work has begun on Phase II.

RECOMMENDATIONS

The following recommendations are made as suggestions for an on-going identification study:

1. For the purposes of the NOBELS Project, a one-page format must be developed together with a computer program that will allow the Principal Investigator to select certain individuals using specific criteria--e.g., a Business Teacher educator that has more than five years of teaching experience on the secondary level, with two or more years of work experience and whose major interest is in the area of office and so on.

2. If the NOBELS Project is funded it is recommended that the data from a single state be updated and the procedures utilized for the national study.

3. That an intensified effort be made to complete Phase II by January, 1969.

4. That a preliminary directory be made available to all contractors and sub-contractors for their use in recruiting appropriate personnel.

5. That the national data collection be initiated no later than December, 1968.

6. That as data from the other contracts in this project become available, the directory be utilized for more effective dissemination of appropriate findings. (Funds for this latter item are not part of the Identification Sub-contract)

7. That approval be granted to print and distribute copies of the directory at cost (if the University will permit such a procedure).

TALENT INVENTORY

For Business and Office Education

(1) NAME

LAST ☐☐☐☐☐☐☐☐☐☐☐☐☐
8   22

FIRST INITIAL ☐
23

MIDDLE INITIAL ☐
24

(2) Permanent Mailing Address

Street Address

☐☐☒☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐
25   46

City ☐☐☐☐☐☐☐☐☐☐☐
               56

State ☐☐
57 58

Zip Code ☐☐☐☐☐
59   63

Area Code ☐☐☐ Telephone Number ☐☐☐☐☐☐☐
64 66   67   73

1 For Office Use Only 7

(3) Name of University, College, School, or Agency currently employing you
(Please abbreviate where possible)

☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐
9   23

City ☐☐☐☐☐☐☐☐☐☐☐☐
24   38

State ☐☐
48 49

Zip Code ☐☐☐☐☐
50   51   55

County ☐☐☐☐☐☐☐☐☐☐☐☐
39   56

Area Code ☐☐☐ Telephone Number ☐☐☐☐☐☐☐
67 68 70 71   77

(4) Check type of institution indicated in Question 3

Column 78 - 1 _____ University or College   2 _____ School or Agency
3 _____ Private or   4 _____ Public Institution (Agency)
5 _____ Two-Year College (Junior or Community College)

(5) Sex (PLEASE CHECK ✓)

Column 8   1 _____ Male   2 _____ Female

(6) Job Title (PLEASE CHECK)

Column 9   1 _____ Business Teacher Educator
2 _____ State Supervisor
3 _____ City Supervisor
4 _____ Doctoral Student
5 _____ Other (Specify): _____
6 _____ Combination of _____ and _____ above

(7) Check here if you are a Department Chairman

Column 10   1 _____

(8) Field of Specialization as a Business Educator (PLEASE CHECK)

Column 11   1 _____ Office
2 _____ Distributive
3 _____ Data Processing
4 _____ Other (Specify): _____
5 _____ Combination of _____ and _____ above

(9) Rank the following in order of your interest and competency
1 = Highest, 2 = Next Highest, etc.

Column 12   _____ Bookkeeping and Related Courses
" 13   _____ Data Processing
" 14   _____ Methods of Teaching Business Subjects
" 15   _____ Distribution and Related Courses
" 16   _____ Secretarial and Related Courses
" 17   _____ Typing
" 18   _____ Other (Specify): _____
" 19   _____ Other (Specify): _____

(10) Educational Background (Please list all degrees)

Indicate (A), your level of education, 1 = Bachelor's, 2 = Master's, 3 = Sixth Year Specialist, and 4 = Doctorate; (B) the year of graduation for each of these levels, and (C) the specific school from which you received each degree (abbreviate where possible):

A   B   C
☐ ☐☐ ☐☐☐☐☐☐☐☐☐☐☐☐☐☐
20 21 22

☐ ☐☐ ☐☐☐☐☐☐☐☐☐☐☐☐☐☐
27 28 29

☐ ☐☐ ☐☐☐☐☐☐☐☐☐☐☐☐☐☐
34 35 36

65

the following activities:

Columns 71-73	Research	___%
Columns 74-76	Teaching	___%
Columns 77-79	Other	___% (Specify ___)

[For Office Use Only] 7

(14) Course Work Data

In the appropriate column, indicate the subjects in which you have had practical work experience and/or course work. (PLEASE CIRCLE)

	PRACTICAL WORK EXPERIENCE	COURSE WORK	BOTH	
Column 8	1	2	3	Accounting
" 9	1	2	3	Business & Distributive (Methods, Research, etc.)
" 10	1	2	3	Communication
" 11	1	2	3	Co-Op Work Study
" 12	1	2	3	Data Processing
" 13	1	2	3	Economics
" 14	1	2	3	General Business (Law, Insurance, etc.)
" 15	1	2	3	Management (Personnel, Office, Principles of, etc.)
" 16	1	2	3	Marketing (Retailing, Advertising, Sales, etc.)
" 17	1	2	3	Office Machines (Duplicating, Voice Record., Cal.)
" 18	1	2	3	Procedures Courses (Secretarial, Office Clerical, etc.)
" 19	1	2	3	Shorthand, Transcription, and related
" 20	1	2	3	Typing

(15). Work Experience in Years

Indicate the amount of work experience in your total field of specialization, i.e., office work experience, distribution, etc.

Columns 21	1 ___	Less than 1 year
	2 ___	1 - 2 Years
	3 ___	3 - 5 Years
	4 ___	More than 5 years

(16) Professional Membership Data

Indicate your membership and/or officership in the following professional organizations: (PLEASE CIRCLE)

	OFFICER	MEMBER	BOTH	
Columns 22	1	2	3	National Business Education Assoc. and Affiliates
" 23	1	2	3	Your State Business Education Association
" 24	1	2	3	American Vocational Association
" 25	1	2	3	Delta Pi Epsilon
" 26	1	2	3	Society for Automation in Business Education
" 27	1	2	3	National Education Association
" 28	1	2	3	American Federation of Teachers
" 29	1	2	3	Your State Federation of Teachers
" 30	1	2	3	Your State Education Association
" 31	1	2	3	Other (Identify: ___)

How many TOTAL YEARS of teaching experience have you had at each of the following levels? (If no experience on a particular level, leave blank.)

(Indicate total years in whole numbers; for example, if you have 2½ years of experience on the Elementary Level, use the next highest whole number or 3 years. If less than 10 years experience on any level, use leading zeros; i.e., 03, 05 etc.)

	Total Years	Level
Columns 41-42	[ ]	Elementary
Columns 43-44	[ ]	Junior High School
Columns 45-46	[ ]	Senior High School
Columns 47-48	[ ]	Post Secondary (13th-14th years) such as Area Vocational Schools, Vocational Institutes Community Colleges and Private Business, etc.
Columns 49-50	[ ]	Adult, Continuing Education
Columns 51-52	[ ]	College or University
Columns 53-54	[ ]	In-Service Training Programs in Business and/or Industry

(12) Indicate the Business Courses you have taught on each of the following levels. (PLEASE CIRCLE)

	Elementary (K-4)	Junior High School (7-9)	Senior High School (10-12)	Adult Education	Post Secondary (Vocational School, Junior Colleges, etc.)	College or University	
Columns 55	1	2	3	4	5	6	Accounting
" 56	1	2	3	4	5	6	Business & Distributive (Methods, Research, etc.)
" 57	1	2	3	4	5	6	Communication
" 58	1	2	3	4	5	6	Co-Op Work Study
" 59	1	2	3	4	5	6	Data Processing
" 60	1	2	3	4	5	6	Economics
" 61	1	2	3	4	5	6	General Business (Law, Insurance, etc.)
" 62	1	2	3	4	5	6	Management (Personnel, Office, Principles of, etc.)
" 63	1	2	3	4	5	6	Marketing (Retailing, Advertising, Sales, etc.)
" 64	1	2	3	4	5	6	Office Machines (Duplicating, Voice Record., Cal.)
" 65	1	2	3	4	5	6	Procedures Courses (Secretarial, Office Clerical, etc.)
" 66	1	2	3	4	5	6	Shorthand, Transcription, and related
" 67	1	2	3	4	5	6	Typing
" 68	1	2	3	4	5	6	Other (Identify: ___)

(19) Have you ever been involved in funded research projects... the following (PLEASE CHECK)

Column 44

0 — Have Never Been Involved
1 — Principal Investigator
4 — Project Director
3 — Consultant
4 — Co-Director
5 — Research Associate
6 — Research Assistant
7 — Other Leadership Position (Specify: _____)
8 — All
9 — Combination of _____

(20) Indicate the approximate number of each of the following items that you have published:

Articles [45 46] Books [47 48] Monographs [49 50] Other [51 52]

(21) Please attach a bibliography of your published papers and/or books, etc. if available (PLEASE CHECK)

List Type of Other: _____

Column 53

1 — Yes, I am attaching one
2 — No, I do not have one available

(22) Please attach a data or other similar sheet which covers your specific areas of Professional Interest if available. (PLEASE CHECK)

Column 54

1 — Yes, I am attaching one
2 — No, I do not have one available

Business Education Conferences and/or Meetings, would you like to participate? (PLEASE CHECK)

Column 32

1 — YES   2 — NO

If yes, please complete Questions (17A) and (17B); otherwise, go Question (18).

(17A) In what capacity would you like to be a participant in NOELS? (PLEASE CHECK)

Column 33

1 — Consultant
2 — Experimental Program Teacher
3 — Research Person
4 — Data Gatherer
5 — Writer
6 — Any of the positions listed if qualified
7 — Other (Specify: _____)

(17B) Would you be willing, IF NECESSARY, to change your location and/or take a leave of absence in order to participate in NOELS? (PLEASE CHECK)

Column 34

1 — YES   2 — NO

(18) Have you ever submitted a proposal to any institution or agency that has been funded? (PLEASE CHECK)

Column 35

1 — YES   2 — NO

If yes, please complete Question-(18A); otherwise, go to Question 19

(18A) Number of Funded Projects [36 37]

Please list the three latest projects.

Year Funded 19 [ ]

Title of Project

A
B
C

FUNDING AGENCY   AMOUNT FUNDED

Columns 38-39   A
Columns 40-41   B
Columns 42-43   C

A
B
C

67

Line Number	Name	First Initial	Middle Initial		Percent-Teaching	Percent-Research	OE/	DE/ Area of Specialization	DP/	RATE INTEREST/COMPETENCY 1-8/1=high bookkeeping/related, data processing, methods of teaching bus. subj., distribution and related, secretarial and realted, typing, other (specify), other (specify)	Highest Degree Held-1, BA 2, MA, 3, SP Year Degree Received 4, PhD/Edd	TEACHING EXPERIENCE/IN YEARS	Elementary
1	Brown	F	S	X	30	3	X	X		00102300	4 52		?
2	Babbitt	T	N	X	100	3				3456127c	4 69		6

Line Number	Accounting	Business & Dist. Methods	Communication	Co-Op	Data Processing	Economics	General Business	Management	Marketing	Office Machines	Procedures	Shorthand, Transcription	Typing	Less than 1 Yr. Work Experience	1-2 Years	3-5 Years	More than 5 Years	National Business Education Assoc.	State Business Ed. Assoc.	American Vocational Assoc.	Delta Pi Epsilon	Society for Automation in BE	NEA	American Federation of Teachers	Your State Fed. of Teachers	Your State Education. Assoc.	Other (Identify)
1	3	3	3	3	0	2	2	1	1	3	3	3	3	X	2	2	3	2	0	2	0	0	2	0			
2	2	2	3	3	3	3	3	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	3			

COURSE WORK DATA

MEMBERSHIP DATA

BUSINESS EDUCATION DIRECTORY - INDEX

NAME			MAILING ADDRESS		CITY
Brown	F	S	WAYNE STATE	UNIV	DETROIT
Babbitt	T	N	GERONIMO ST U	COLLEGE OF ED	PIZZA

THERE IS A SLIGHT PROBLEM ON CARD   1253 - THE SEX IS LISTED AS
CARD   1253 SHOWS ERROR SPECIALIZATION OF 9.
CARD   1254 SHOWS ERROR IN YEARS WORK EXP. OF 9.

Courses taught on various levels
1=Elem. 2=Jr. HS. 3=Sr. H.S. 4=Adult
5=Post Secondary 6=College or Univ.
7≡3≠1,2,4,5. 8=6+3 and any other #
9=6+1,2,4,5

Jr. High School	Senior High School	Post Secondary	Adult, Continuing Education	College or University	In-Service Training Programs in Bus/Ind	Accounting	Business & Dist Methods	Communication	Co-Op Work Study	Data Processing	Economics	General Business	Management	Marketing	Office Machines	Procedures Courses	Shorthand, Transcription	Typing	Other	Other	Other	Line Number
1	1	0	0	20	0	3	6	6	6	0	0	3	6	6	3	3	3	3	0	0	0	1
6	7	8	1	10	1	3	4	0	3	4	0	3	5	3	0	5	0	3	5	3	4	2

Number of Funded Projects	Latest year of funded project	Published Articles	Published Books	Published Monographs	Published Other	Data Sheet (X = YES)	Sex M= Male F=Female	Future Nobels (X=will participate	Participate as Consultant	Experimental Program Teacher	Research Person	Data Gatherer	Writer	Willing to Move (X=YES)	Line Number
12	68	75	4	0	0	X	M	X	X	X	X	X	X	X	1
0	0	83	99	10	12	X			X			X	X		2

ST	ZIP	TELEPHONE			SEX	DIRECTORY PAGE-LINE	
MI	48202	(313) 83	-	30	M	3	1
MN	55923	( )	-	30		3	2

9. SEX WILL NOT BE LISTED FOR THIS PERSON. CHECK IT.

OUTLINE OF ACTIVITIES CONDUCTED BY THE CENTER FOR VOCATIONAL
AND TECHNICAL EDUCATION ON PROJECT NOBELS

June 28, 1967 - December 31, 1967

July 18:   Battelle Institute
           Discussion of Systems Approach to Education

Participants

       Dr. Bill Hitt, Head Behavioral Sciences, Battelle Institute, Columbus, Ohio
       Dr. J. Marshall Hanna, Professor, Business Education, The Ohio State
       University, Columbus, Ohio
       Dr. Inez Ray Wells, Professor, Business Education, The Ohio State University,
       Columbus, Ohio
       Dr. Harry Huffman
       Mrs. Marla Peterson
       Miss Annell Lacy

July 24:   Battelle Institution
           Discussion of Planning the Research Program

Participants

       Dr. Bill Hitt
       Dr. Harry Huffman
       Mrs. Marla Peterson
       Miss Annell Lacy

July 26:   Meeting at Battelle Institute
           Discussion of Proposal Preparation

Participants

       Dr. Bill Hitt, Head Behavioral Sciences, Battelle Institute
       Dr. Frank Lanham
       Dr. Harry Huffman
       Mrs. Marla Peterson

August 5-8:   Ann Arbor, Inn America
              NOELS Proposal Writing

    Dr. Joseph Hill
    Dr. Rashid Bashshur
    Dr. Fred Cook
    Dr. Harry Huffman
    Mr. John Lambert
    Mr. Tom Brody

August 12-15:   Meeting at Ann Arbor, Inn America
                NOELS Proposal Writing

    Dr. Joseph Hill
    Dr. Rashid Bashshur
    Mr. Tom Brody
    Dr. Fred Cook
    Dr. Harry Huffman
    Mr. John Lambert
    Dr. Frank Lanham
    Dr. Donald Tate
    Dr. Edwin Swanson
    Miss Annell Lacy

August 22:   Meeting at The Center BESC Executive Meeting and a Panel of
             State Supervisors
             (See attached sheet for participants)

August 29:   Battelle Institute
             Discussion of Tentative Research Proposal

Participants

    Dr. Bill Hitt
    Dr. Harry Huffman
    Miss Annell Lacy

August 29:   Meeting at The Center
             Discussion of Progress on Planning and Feasibility Study in
             Office Education and Center's Role in Research Project

Participants

    Dr. Robert E. Taylor
    Dr. Edward Morrison
    Dr. Harry Huffman
    Miss Annell Lacy

LIST OF PARTICIPANTS
Meeting of August 22, 1967
The Center for Vocational and Technical Education
Columbus, Ohio

Mr. Robert D. Balthaser
State Supervisor of Business and Office
    Education
State Department of Education
Columbus, Ohio

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September 12, 13:   Meeting at The Center
                    Discussion of Changes that Should be Made in Tentative
                    Proposal

Participants

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    Dr. Frank Lanham
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September 19:   Meeting at The Center
                Methods of Analyzing Office Work

Participants

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September 28:   Meeting at The Center
                The Office as a Part of the Management Information System
                (See attached sheet for participants)

September 29:   Meeting at Arps Hall
                Synthesis of September 28, 1967, "The Office as a Part of
                the Management Information Systems"

Participants

    Dr. Charles B. Hicks
    Dr. J. Marshall Hanna
    Dr. Harry Huffman
    Miss Annell Lacy

October 3, 4, 5:   Meetings at The Center
                   Discussion of Methods and Procedures for Accomplishing
                   Objectives of Determining Office Activities

Participants

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October 10: Meeting at The Center
            Alternative Approaches for Looking at Office Activities
            and Writing Behavioral Objectives

Participants

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APPENDIX H-2

REPORT OF ACTIVITIES CONDUCTED BY THE
CENTER ON PROJECT NOBELS

June 28, 1967 - December 31, 1967

The first meeting which the Center staff had during the current period was at Battelle Memorial Institute on July 18. Dr. William Hitt, Director of Behavioral Sciences at Battelle, was asked to explain the systems approach to education.

Dr. Hitt described the systems approach as it has been used in relation to other fields of study. Some of the points made concerning the systems approach to education were:

1. The systems approach is trying to optimize resources--in order to do what is best for the particular system there must be a number of variables to consider.

2. Objectives must be set up which can be achieved with available resources, and those restraints which might prohibit the accomplishment of stated objectives must be indicated.

3. Alternative strategies must be determined. As the research project progresses, the researchers must come up with alternative strategies in getting at the problem.

4. Establish an attitude for looking at the problem. The researcher must keep in mind that there is no one procedure for researching the problem. Objectives must be related and looked at in operational terms. There must be an hierarchy of objectives - an operational level.

5. Method of attaching the research project.

    1. Establish content elements to meet each objective.
    2. Research objectives as to cost and other benefits.
    3. Determine alternative methods.

On July 24 the Business and Office Staff at the Center met with Dr. William Hitt, Director of Behavioral Sciences, Battelle, to discuss "Planning the Research Program."

The following items were discussed in relation to planning the research program.

1. What are the objectives of the research program?

2. What is the relative importance of these objectives?

3. How can the accomplishment of these objectives be measured?

4. What are the resources available to the research program?

5. What are the boundary conditions imposed on the research program?

6. What are reasonable alternative strategies for accomplishing the program objectives?

7. What are the potential benefits associated with each alternative strategy?

8. What are the estimated "costs" associated with each alternative/

9. What alternative strategy should be selected?

10. What steps should be taken in implementing this strategy?

This meeting served as a background for planning the meeting held in Chicago on June 30, 31, 1967.

The Center Staff consulted with Dr. Bill Hitt on July 26 to discuss proposal preparation. The following items were discussed:

1. What is the system under study?

   a. What are the objectives of the system?
   b. How can the accomplishment of these objectives be measured?
   c. What are the components of the system?
   d. What parameters influence the system?
   e. What are the important properties of the system?

2. What is the problem?

   a. What is the present state of the system?
   b. What is the desired state of the system?
   c. What is the nature of the discrepancies between the actual and the desired?
   d. Why do these discrepancies exist?

3. What should be done?

   a. What are alternative strategies for solving the problem?
   b. What are the pros and cons of each alternative?
   c. What appears to be the most reasonable alternative?

4. What can be expected?

   a. How is the system likely to change as a result of implementing the results of the selected alternatives?
   b. What progress indicators can be used to assess progress?

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The BESC Executive Committee invited consultants from other disciplines to a meeting in Chicago on July 30 and 31. At this meeting the progress of the research project was presented to the participants in order to bring them up to date. After the nature of the project had been described, the consultants made suggestions and recommendations to the BESC Executive Committee. These suggestions and recommendations included ways of incorporating into the Business and Office Project research that has been done in other disciplines.

On August 5-8 and August 12-15, members from the BESC Executive Committee met at Ann Arbor, Michigan, to draw up a tentative proposal for researching behavioral objectives for business and office education.

State supervisors met with the BESC Executive Committee on August 22 at the Center. This meeting focused on problems and suggestions which the state supervisors thought significant to research to determine the behavioral objectives for business and office education.

The BESC Executive Committee asked for suggestions from the state supervisors as to how the state supervisors would like to help participate and cooperate in the total research project.

Following the writing of the tentative proposal, the Center staff met with Dr. William Hitt, Battelle, on August 29 to evaluate the proposal. The primary objective in meeting with Dr. Hitt was to determine whether the systems approach had been consistently and accurately written into the proposal. Some of the comments which Dr. Hitt made were:

1. Define the system which you are talking about more clearly.

2. Diagram the total program to indicate how various projects are interrelated.

3. Define business and office education.

4. Indicate predictions for business and office education

    a. Office requirements: manpower
    b. Office equipment: changes in equipment over the next 10 years, etc.

5. Indicate how this approach differs from other approaches. Show what is really new in the project.

6. Specify what the end product is expected to be.

    a. Is it guidelines?
    b. Is it a technique?
    c. Is it tested materials?

7. What difficulties do you expect to encounter?

    a. Adoption problems
    b. Predictions of future requirements
    c. Implementation

The Center staff in Business and Office Education met with the Director of the Center, Dr. Robert Taylor, after the meeting with Dr. Hitt on August 29. The meeting with Dr. Taylor was to determine what the Center's role should be in the project. Dr. Taylor suggested the following involvement for the Center:

1. Coordination of research

2. Communication of project progress

3. Long-range planning - look not only for today's problems, but tomorrow's problems as well

4. Research Management - A research management expert should audit research at key points

5. General Support - provide training sessions, project staff for training of research techniques, provide continuing consultation.

A telephone survey of business firms in Columbus was made on September 6, to determine the extent of familiarity of personal managers with

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the Dictionary of Occupational Titles and its uses. The survey of several large firms in Columbus, indicated that only two personnel managers were familiar with the DOT and that only one of the firms actually used the DOT as a guide for establishing titles for office workers.

A meeting was held at the Center on September 12 and 13, to determine the changes that should be made in the tentative proposal which was written during August at Ann Arbor. Dr. Huffman, Dr. Lanham, and Dr. Cook discussed and analyzed the changes that had been suggested to them by various consultants since the time the proposal had been written.

Intormation management consultants were invited to the Center on September 28 to discuss the role of th office in the handling of information. The following is a report of the outcomes of that meeting.

After the information management consultants had met with the Center Staff, a meeting was held on September 29 to synthesize the comments of the information management consultants. The synthesis was then used as a basis for planning research of the office and its place in facilitating information.

Writing sessions were held at the Center on October 3, 4, and 5, to outline the methods and procedures for determining the activities of the office in handling information. Consultants from business education and management helped write the methods and procedures.

After the Center staff had completed the outline for researching office activities as they relate to information handling, a meeting was held with other BESC members at the Center on October 10 to determine alternative approaches for looking at office activities and writing behavioral objectives.

During the months of November and December the Center staff made a search of secondary sources for office activities. The activities that were secured from secondary sources will be used to make a taxonomy of office activities. The taxonomy of office activities will then be used as a basis for analyzing office jobs. After the analysis of office jobs has been completed the taxonomy will be rewritten to include additional activities that have been determined from the job analyses.

A Research Planning Meeting

September 28, 1967

The Office as a Part of the Management Information System

The primary purpose of this meeting was to identify ways of determining what is going on in the office now and in the future. A knowledge of what is going on in the office is needed as a basis for developing programs and curriculum materials to train people for office work.

Overview

Each year the number of productive blue-collar workers decreases while the number of white-collar woakers increases. In a society where the work of white-collar workers acccounts for approximately 50 percent of the gross national product, the white-collar workers must be considered productive. The question is, "What is the white-collar worker producing?"

Many office management experts suggest that the final product of the white-collar worker is information. The raw material of the office, that is, information, is data, and the process through which the raw material must go to become the final product of information is data processing. Data that has been processed becomes inventory until it is needed for decision-making within the organization, and then it is information.

Office workers are responsible for the processing of data. Therefore, leaders in business and office education are seeking ways to determine all the activities that are involved in processing data in order to prepare young people for office work.

Area of Concern

The participants discussed several areas that are of vital concern in determining the role of the office worker in the processing of data and the handling of information. Some of the questions raised and a brief analysis of the discussion concerning each question follows:

1. What kinds of information are needed?

   Basically, there are two needs for information: (a) routine processing of clerical papers i.e., invoices, paychecks and (b) reports to aid management decisions.

2. Should office workers be trained in terms of automated offices?

   Statistics show that 99 percent of all firms employ less than 20 office workers. Yet, probably 99 percent of all office workers are employed in large corporations that employ 20 or more office

workers. Therefore, the number of office workers in the non-computer office may be relatively few in number. Those offices that do not have computers may use a computer time-sharing plan.

3. What is the ultimate objective of office work?

Increased cost of hardware equipment have resulted in an increase in the cost of processing data. However, the ultimate objective in office is not one of cost reduction alone but also of increased productivity. The entire operation of the organization is based on the management's ability to have relevant information at all times. The increase in productivity of salable services will sometimes increase overall profits of an organization to the extent that hardware costs are offset.

4. How does one determine what data is relevant?

Many organizations have more data accumulated than is relevant or needed for the operation of the organization. This can be thought of as excessive inventory. Office managers need to know how to determine what data and information is relevant to the organization's needs.

5. Do we train students for terminal jobs?

In today's constantly changing technological society, workers cannot assume that they will enter a job and remain in it. Therefore, training is considered terminal only to the extent that students will stay on in the world of work rather than returning to school.

6. What are the fundamentals that we want from the high school graduate?

Students may be trained in terms of manipulative skills or taught specific knowledges. Office workers today must have accuracy, logic, and skill. Certain decision-making activities are required of office workers in most jobs. One method of determining the skills an knowledges required might be through an analysis of mental and analytical activities in the office.

7. How does one determine which jobs to analyze?

There are various lists of job title classifications which could be used. For example, the DOT put out by the U. S. Department of Labor, the list put out by AMS, and many large corporations have their own job title classifications for all their branch offices. Using job titles are often misleading. In the past many job titles have been based on pay rather than job content. Perhaps job titles as they are currently used in offices could be used only as a guide to determine office jobs to analyze. These office jobs could then be analyzed to determine activities that actually take place in the office. The activities could then be

grouped into clusters of common activities. The clusters of activities could presumable fall into clusters of commonality in areas of work as well as in areas of subject matter.

8. After job activities have been determined, how can one determine whether or not to include such activities in an educational program?

The following criteria might be used for including or eliminating activities:

a) Frequency
b) Difficulty
c) Universality of use
d) Most feasible place to teach (school or on the job)
e) Importance of activity to business.

9. What are some of the things that might influence the office?

a) Mechanization
b) Hardware
c) Space
d) Furniture
e) Data communications

10. Can students be taught in such a way that there is a transfer of learning from the classroom situation to the office?

Experience indicates that workers under 20 years of age are less adaptive to new situations and change than are workers 30 years or more of age. Perhaps, it would be fruitful to determine the elements of adapting to new situations and determine whether they can be taught.

The ability to transfer learning is highly dependent on the worker's attitude. Some of the attitudes which should be developed are:

a) Willingness to change
b) Attention to detail
c) Discipline to accuracy
d) Timeliness (Promptness)
e) Curiosity to learn.

The participants of this meeting were in agreement that a method for analyzing job activities and the criteria for selecting the offices to be used in the analysis is of primary importance.

The following list of procedures for determining office job activities might be used:

a) Develop a job analysis instrument
b) Select the office sample
c) Analyze jobs for activities
d) Evaluate activities

e) Group activities into clusters
f) Prepare classification of job-activity clusters.

11. What is a model for examining some of the problems in office education?

Areas of Influence on Office Education (A Model)

Office Skills
(Activity verbs)
see list below

Information
Systems

Data
Communications

Applications
(Nouns)

Office Hardware
Development

Conditions
(Modifier)

Motivation
and attitude

Learning
level

Shaded part represents what we know, and therefore represents the limist as to what can be taught in these eight segments.

12. What is a list of verbs that describe office activities? (The beginnings of such a list follows.)

Filing	Retrieving	Conversing
Sorting	Matching	Typewriting
Classifying	Inspecting	Table searching
Coding	Extending	Calculating
Indexing	Controling	Keypunching
Releasing	Flow-charting	Updating
Abstracting	Analyzing	Judging
Computing	Corresponding	Data Accumulating
Comparing	Matching	Data Transferring
Dictating	Transcribing	Documenting
Recording	Duplicating	Retaining
Evaluating	Inferring	Charting
Graphing	Planning	Programming
Testing	Communicating	Reporting
Data Reducing	Sequencing	Allocating

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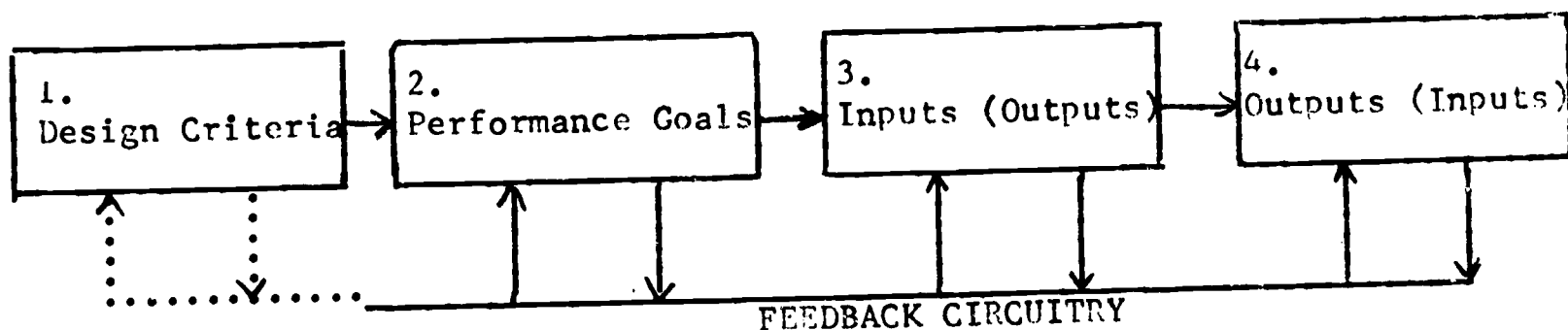Columbus, Ohio 43212

APPENDIX I

NEW OFFICE AND BUSINESS EDUCATION LEARNINGS SYSTEM

A. CHARACTERISTICS OF NOBEL SYSTEM MODEL

The purpose here is to describe in some detail the systemic model developed and illustrate its use as a developmental model for converting performance goals to learning programs that can be tested and improved through feedback circuitry.

The universal features of this systemic analysis are expressed in four basic elements: design criteria, performance goals, inputs (outputs), and outputs (inputs), together with the circuitry for feedback and self-adjustment as shown in the following model:

It is important to remember that the systemic approach as applied in engineering or psychology has been designed primarily to provide models (iconic, analog, or mathematical) of the subject matter under study and employ these models for purposes of analysis and simulation. The NOBELS approach, however, has been designed to provide a systemic model which can be employed in the analysis and developmental stages of producing new learning programs for business and office education. The NOBELS model has not been designed to effect simulations in business and office education. Despite the limitation of not providing for simulation in the immediate future, the NOBELS model can serve as a prototype for the first segment of a series of developments that could produce a total systemic approach to be applied throughout all areas of education, vocational and general.

The level at which a system is achieved is largely an arbitrary decision. As Kennedy pointed out, "Systems in general are synthetic organisms and are not as easily defined, specified, or recognized as natural organisms because they are not bounded by a generally accepted interface such as the skin."[1] What has been lacking in educational systems development may be that essential requisite of a system, namely, closure. The NOBEL system, however, is designed to consider the contextual social reality of the office (the office worker and the skills of the trade), thereby providing the necessary feature of closure in this system.

Perhaps the term "system" is, in some sense, arbitrary and depends heavily on a priori definitions of tasks or problems. However, if the

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[1] John L. Kennedy in Gobert M. Gagné et al., Psychological Principles in Systems Development. New York: Holt, Rinehart and Winston, 1962, p. 15.

ultimate purposes, as they are for science as a whole, are to "describe, predict, and control" social behaviors, then the social context has to be considered in business and office education system design. Indeed, NOBELS is based on the premise that human behavior does not occur in a vacuum and can only be understood in context of the social organization in which humans are involved. Moreover, norms of behavior are generated by the social organization. The basic function of these norms in the organizational setting is to insure the continuity of the organization through conformity of individual behaviors to organizational expectations.

1. Rationale for Design Criteria

Design criteria are included to accommodate the general objectives of an educational program. Such objectives are usually not included in system designs that are applied to machines, engineering endeavors, and other areas of physical science. The advantage of including design criteria in the model of the proposed system is that, in addition to the usual specific behaviors, social roles and organizational norms will thus be accommodated.

2. Rationale for Performance Goals

In the model, performance goals account for statements expressed in terms of specific behaviors, social role behaviors, and social norms that are amenable to measurement or assessment. Attainment of the performance goals by a system assures the fulfillment of the design criteria of the system. Performance goals might not be attained as a result of the lack of inputs in terms of persons, properties, or processes. Hence, some performance goals must be modified according to the limitations of the inputs element. The feedback circuitry in the model provides analysis on which modification can be based. It is generally agreed that tight-loop feedback circuitry is highly desirable if a system is to respond successfully to the task selected for accomplishment.

3. Rationale for Inputs and Outputs

The inputs and outputs elements of the model are also determined in terms of persons, processes, and properties. The inputs element represents the learnings program designed through performance goals to shape behavior expected in the outputs element. The totally successful system is one which produces in its outputs element those persons, processes, and properties that totally satisfy the performance goals of the system. However, rarely is total success attained in operation. In most cases, the outputs of the system fall short of the performance goals, and, through analysis, the reasons for the shortcomings are traced to either inputs or unrealistic performance goals of the system.

B. DESIGN CRITERIA AND EXAMPLES OF CONSEQUENT PERFORMANCE GOALS

Major design criteria for NOBELS (not necessarily in the order of their importance) are designated below. Examples of systemis performance goals that will be used to evaluate the NOBEL system follow each criterion.

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l. Criterion of Articulation

The NOBELS approach emphasizes the necessity for articulating voca-
tional and academic learnings in order to provide an organic approach for
developing business and office education programs.

Performance Goal a. Users of the NOBELS approach should form inter-
disciplinary teams, at least one m mber of which will be a business and
office teacher, to meet regularly during a specified period of time to
develop learning materials and strategies which are amenable to articula-
tion in terms of the disciplines represented on the teams.

Performance Goal b. Users of the NOBELS approach should produce
learning materials which are amenable to partial measurement by means of
communication and computation skills achievement tests. The tests should
be at differential levels of difficulty and should articulate the busi-
ness and office education materials in terms of the fields of communica-
tion and computation skills.

To emphasize the importance of writing performance goals in terms
that are amenable to measurement, a fictitious situation follows to show
how to determine the extent to which each of the goals stated above (two
examples of the many performance goals that can and will be written for
the Criterion of Articulation) has been attained in this setting. In the
case of determining the extent to which Performance Goal a has been at-
tained in the fictitious setting, the observer would determine whether
the learning materials and strategies had, in fact, been prepared by an
interdisciplinary team, and whether that team had met regularly during
a specified period of time for the expressed purpose.

To determine the extent to which the second performance goal is
satisfied by the situation, the observer might examine a typing lesson in
which the textual material includes sentences with blank spaces in which
certain numerical values are to be inserted. The student is instructed
to perform certain computations to find these values and type them in the
blank spaces. Suppose also, that the learning materials being used pre-
scribe that the student, after a first typing of the text, re-write the
material in correct English (prior to typing it) and then re-type the total
unit. In addition to these check points, a short test in th omputational
skills taught could be included. In similar fashion, the communications
skills involved in the lesson should be measured. Inclusion of such tests
in the learning materials would demonstrate to the observer that the in-
tended results of these two performance goals were being satisfied.

It should be noted that these two performance goals examples did not
call for performance measures of student behavior. Therefore, in attempt-
ing to determine the degree to which these goals had been attained in the
fictitious situation, the observer would not seek performance measures on
the participating students. Obviously, student performance is an impor-
tant aspect of articulation, and as such would be covered by performance
goals written for the purpose of considering this aspect of the Design
Criterion for Articulation.

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2. Criterion of Information and Facilitation

The NOBELS approach conceptualizes the office as an information and facilitation system.

Performance Goal a. The group employing NOBELS should develop materials for learning which will show, by means of loop films, slides, video tapes, organizational charts, and supplementary written materials that selected aspects (e.g., memorandum writing, "intercom" systems) of the office operation can be learned and analyzed as an information system. The criteria for determining whether the task involved (preparing materials that actually instruct students in the specified subjects) has been accomplished will be stated in terms of student scores on appropriate achievement tests and performance scores on appropriate laboratory task exercises.

Performance Goal b. The group employing NOBELS should develop curricular materials which will provide students with a capability for identifying the steps of handling and processing information in relation to an office system. The criteria for measuring the degree to which this task has been accomplished will be determined on the bases of student scores on tests designed to measure the capability involved and student performance, measured in terms of how well the student demonstrates expected behaviors, in role playing sequences pertaining to the handling and processing of information in a simulated office setting.

Problems involving the handling of office data (e.g., distribution patterns to be followed by mailroom clerks in the retrieving and dissemination of information as a part of an organization's function) should also be devised.

These examples of performance goals emphasize the importance of the Design Criterion of Information and Facilitation: office workers frequently must demonstrate that they understand the importance of the flow of information into, through, and out of an organization for an office's successful operation. Other performance goals concerning this criterion are in the process of being written, and still others will be constructed as the NOBELS study progresses.

3. Criterion of Current Relevance.

The NOBELS approach emphasizes specific skills and adaptability skills that are relevant to (and measurable in terms of) current or emerging office practices and the prescribed, expected, and normative social roles of the office worker.

Performance Goal a. The NOBELS approach demands that participating business educators employing it establish two-way channels of communication with appropriate business offices in the form of (a) personal contacts, (b) correspondence, (c) published literature, (d) news, radio, and television media, and (e) other vehicles available to the institution; where the establishment of the channels is recognized to exist by, not only the business educator, but also by appropriate management personnel in the business offices that are participating in the communication

network. This performance goal is necessary to provide participants in NOBELS with current information concerning business developments, emerging office practices, and information about the relative success of graduates.

Performance Goal b. The NOBELS approach demands that participating business and office educators adapt their instructional materials and programs of business and office experiences to the demands of emerging office practices that are responses to the contemporary age of automation and cybernetics. This goal insures that NOBELS will remain responsive to contemporary society and as such becomes a self-adjusting system.

These are but two of the performance goals that will be employed in association with the criterion of current relevance. As the study progresses, further refinement of the model (and the system) will be effected by the establishment of performance goals covering other aspects of the relevance criterion.

4. Criterion of Environmental Relationships

The NOBELS approach recognizes the importance of educational experiences that produce in the student a measurable capability in learning how to learn, so that he will adjust to a changed (and changing) working environment.

Performance Goal a. The users of the NOBELS approach should employ instructional methods and materials that will provide students with experiences in problem solving by analyzing and then synthesizing a set of elements by means of one of three (or a combination thereof) paradigms (e.g., analog model of evaluation, a flow chart of a certain type of office procedure, a simple mathematical procedure, i.e., writing a relationship between the variables involved). These processes could be measured by means of student performance measures (scores) on a series of laboratory exercises that are parallels of the learning materials.

Performance Goal b. The users of the NOBELS approach should provide the student with a set of on-the-job experiences, with particular emphasis being placed upon the necessity of the student to observe the importance of (supervised) human relations in the office environment. The performance measures for this set of tasks will be ratings by the work supervisor, the educational supervisor, and the student himself concerning his awareness of human relations, individual differences, differing cultural backgrounds, physical conditions, and other related factors.

Another performance measure of these goals might be how well the student is judged to work with people, by his peers, his teachers, and other persons in the school situation in a position to provide an informed assessment of this facet of the student's activities.

5. Criterion of Individualization

The NOBELS approach emphasizes the importance of knowing the student's entry behavior and ability to learn in order to pace his office education experience and ultimately his adaptation in an office job.

Performance Goal a. The organization employing the NOBELS approach will measure: (1) the entry behavior of the participating students in terms of motivation and personal history; and (2) the entry mental abilities of students in terms of quantitative and verbal aptitude; achievement in those special skills considered by the business educator and the school system to be essential to the field of office education; and achievement in the basic education areas of communication skills, computation skills, and personal-social skills; by means of data collection instruments (tests and inventories) that have reliability and validity indices that are acceptable to the business and office educator (teacher) and the school system involved; and this total activity will be accomplished prior to the students' participation in the instruction program prescribed by NOBELS. This goal is necessary because the business and office teacher must have this information prior to attempting to establish a pace for the program of educational experiences for an individual student or group of similar students.

Performance Goal b. The organization employing the NOBELS approach will maintain throughout students' educational careers records updated on the basis of regular 90-day report periods, that include: (1) the behavior of the students measured in terms of their present motivation and personal (updated) histories and (2) the current mental and skill abilities of students measured in terms of quantitative and verbal aptitides (certain aptitudes can be learned); achievement in those special skills considered by the business and office educator and the school system to be essential to the field of office education; and achievement in the basic education areas of communication skills, computation skills, and personal-social skills. Such measures will make possible, at certain points of time in students' education careers, predictions (accompanied by probability statements) concerning potentialities and general capabilities for being employed and holding a beginning office job in a business located in a geographical region that could reasonably be supposed to be served by the school system involved.

Obviously, these performance goals are but two of the many that will be constructed to determine if the criterion of individualization is satisfied by the system. Failure of the system to satisfy a performance goal leads to an analysis (through the feedback channel of the system) of the deficiency to determine its source. When the source of the deficiency is determined, action is taken to correct the deficiency and the system is adjusted accordingly. Correction of a deficiency may be effected by: (1) adding (subtracting) certain inputs, (2) adjusting performance goals, or (3) eliminating unrealistic goals. Because the elimination of a performance goal usually implies alteration of the design criterion, thus, in effect creating a relatively new system, this section is considered to be the least acceptable of the alternatives, and should be avoided whenever possible. Careful planning, assessment, and precise statement of a performance goal reduce the probability of its being the source of a deficiency, and hence of the necessity of eliminating it from consideration in the systems analysis operation.

6. Criterion of Economic Efficiency

The NOBELS model requires that persons, processes, and properties used in office education programs will provide more business and office

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education experiences (e.g., shorthand taught by tape recorder program) for students with teachers (freed from routine who can perform other important management functions) than is possible in present business and office courses or curriculum.

Performance Goal a. The groups which employ the NOBELS approach must: (1) collect fiscal year cost data (e.g., direct cost per student hour of instruction, amortized costs of machines and equipment, direct costs of materials) that are calculated on the basis of the operation in force prior to the adoption of NOBELS, (2) calculate those same costs (with adjustments for such features of the general economy of the nation as differing labor costs and higher prices) during the fiscal year that NOBELS is employed, and (3) establish efficiency index numbers which are ratios in which the numerator is composed of the current fiscal year (adjusted) cost of an operation under the NOBELS approach; and the denominator is the cost of the same operation for the fiscal year prior to the adoption of NOBELS. These index numbers will be one type of performance measure by which the degree to which the criterion of economic efficiency is being attained can be determined.

Performance Goal b. The groups which employ the NOBELS approach must: (1) collect statistics on the number of students involved in the business and office education curriculum; the amount of money being spent on materials or media of instruction; the number of teachers involved in the program, and other similar types of statistical and financial data that apply to the operation during the fiscal year prior to the adoption of NOBELS; (2) collect the same data for the fiscal year during which NOBELS is in operation; and (3) establish index numbers for each category of these data. These indices will be another type of performance measure of the economic efficiency criterion.

Performance Goal c. The users of the NOBELS approach will derive an index number for parsimony, by comparing the number of courses taught during the year that NOBELS is employed with the number taught in a preceding year. It is assumed here that whenever and wherever students can pursue their goals of learning by independent study, programmed instruction, or participation in self-directed simulation, for example, it will not only reduce the number of courses to be taught by the staff, but will provide opportunities for faculty members to participate in other types of activities (e.g., vocational guidance, innovative activities) that will contribute to the enrichment of the business and office education program in various ways.

Other performance goals in terms of performance measures for job retention, rates of students, costs of materials, time and motion indices for teachers, and time available for student involvement in general education prior to, and during, the NOBELS operation, are in the process of being prepared. As other performance goals for the criterion of economic efficiency are constructed and tested, this aspect of the NOBELS approach will be improved. It is hoped that through the analyses and demonstration projects, and the dissemination project, other dimensions of the criterion of economic efficiency may be explored and developed. As indicators are produced by these projects, the NOBELS approach will be adjusted accordingly.

BESC   CHICAGO   JULY 30-31, 1967

PLANNING OUTLINE TO DEVELOP

A "NEW" OFFICE EDUCATION CURRICULUM

I. Introduction

A. Purpose: To develop, test, and disseminate a "new" program for
    office education.

    1. By develop we mean:

        a. Extracting the behavioral tasks expected of office employees
            to enter and adapt to an entry office job. (Enter means in-
            itial fulltime employment; "adapt" means successful con-
            tinuance in fulltime employment).
        b. Determining specific ending behavioral goals necessary as
            the output of an office education program.
        c. Arranging sequentially the terminal behaviors in a learn-
            ing order.
        d. Determining the number of modules required for attaining
            each terminal behavior. (A module is a unit of time. If
            ten minutes, in length, a current 50 minute class period
            consists of five modules.)
        e. Developing specifications for determining learning stra-
            tegy (man, machines, materials).
        f. Developing individual modules and testing with target
            students.
        g. Revising.
        h. Pulling package together, testing, revising.
        i. Disseminating.

    2. By "test," we mean eliciting data needed to evaluate the ef-
        ficacy of the parts of the new system.
    3. By "disseminate," we mean the involvement of teacher educators,
        supervisors, and all other decision makers in explaining and
        advocating the "new" curriculum. The target is 75 percent ac-
        ceptance in secondary schools of the country.
    4. By "curriculum," we mean all men, materials, methods, machines
        --(within constraints of present typical classroom). (Obviously
        materials currently available may be used as they fit.)

II. The Problems

A. The changing business world and changing offices and jobs in that
    world.

    1. Information processing and "theory" as a foundation for office
        education--the need for a "conceptual framework."
    2. The changing ways in which information is processed and the
        need for adaptive behavior.
    3. The "information explosion" and its consequences in terms of
        needed interdisciplinary approaches to knowledge.

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            advocating the "new" curriculum. The target is 75 percent ac-
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        1. Information processing and "theory" as a foundation for office
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        2. The changing ways in which information is processed and the
            need for adaptive behavior.
        3. The "information explosion" and its consequences in terms of
            needed interdisciplinary approaches to knowledge.

B. Office teachers do not have available:

1. Tools for keeping up to date
2. Methods for determining with clarity the terminal goals needed by students and the consequences of those goals (measurement).
3. Systematic process for office curriculum modification through feedback.
4. Materials or strategies that match current educational potentials of "hardware" and software."

C. Student's individual needs, all needs, have not been assessed in terms of office education curriculum.

1. The national concern for deprivation is an office education concern (17 percent unemployment among high school leavers; double that among certain racial and ethnic groups).
2. The "lip" service given to individual differences in the past, but the potential of utilizing new strategies to attack the problems of a wide-range of variability and the unique characteristics of pupils who face daily the classroom teacher.

D. Problems related to dimly-viewed or unorganized interface of office education with:

1. Other subsystems in education—general versus vocational; local versus state; local, state versus federal; business and industry subsystems; and/or governmental subsystems.
2. Business and economic units and their pressing changing needs.
3. Home, social, and political units that provide, on the one hand, resources to be used but, on the other, challenges and criticisms to be met.
4. Related educational disciplines and their contributions—business administrators, behavioralists, learning theorists, psychometricians, economists, engineers, etc.

III. Scope

A. Scope of office jobs involved, of level, of students, of teachers, of teacher education institutions, of decision makers. The self correcting system. Scope of fundamental research. Dissemination.

IV. The General Approach

A. Guiding characteristics—

1. Theory of information applied to office education
2. Qualitative themes of office worker competence
3. Scope of functions of business
4. End goal of acceptance

B. Organization and management to get the job done
C. Four phases of the total project (see chart following)

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V. <u>Expected Outcomes</u>

    A. A product: "new" office curriculum. A self correcting process:
        A system for curriculum modification

VI. <u>Phase--October 28, 1967</u>

    A. Purpose
    B. Objectives
    C. Procedures

        1. Organization and management

            a. Developing a pattern
            b. Subcontracting
            c. Fundamental research

        2. Determining job tasks
        3. Determining "adaptability" and testing adaptability assump-
           tion.
        4. Determining evaluative strategies
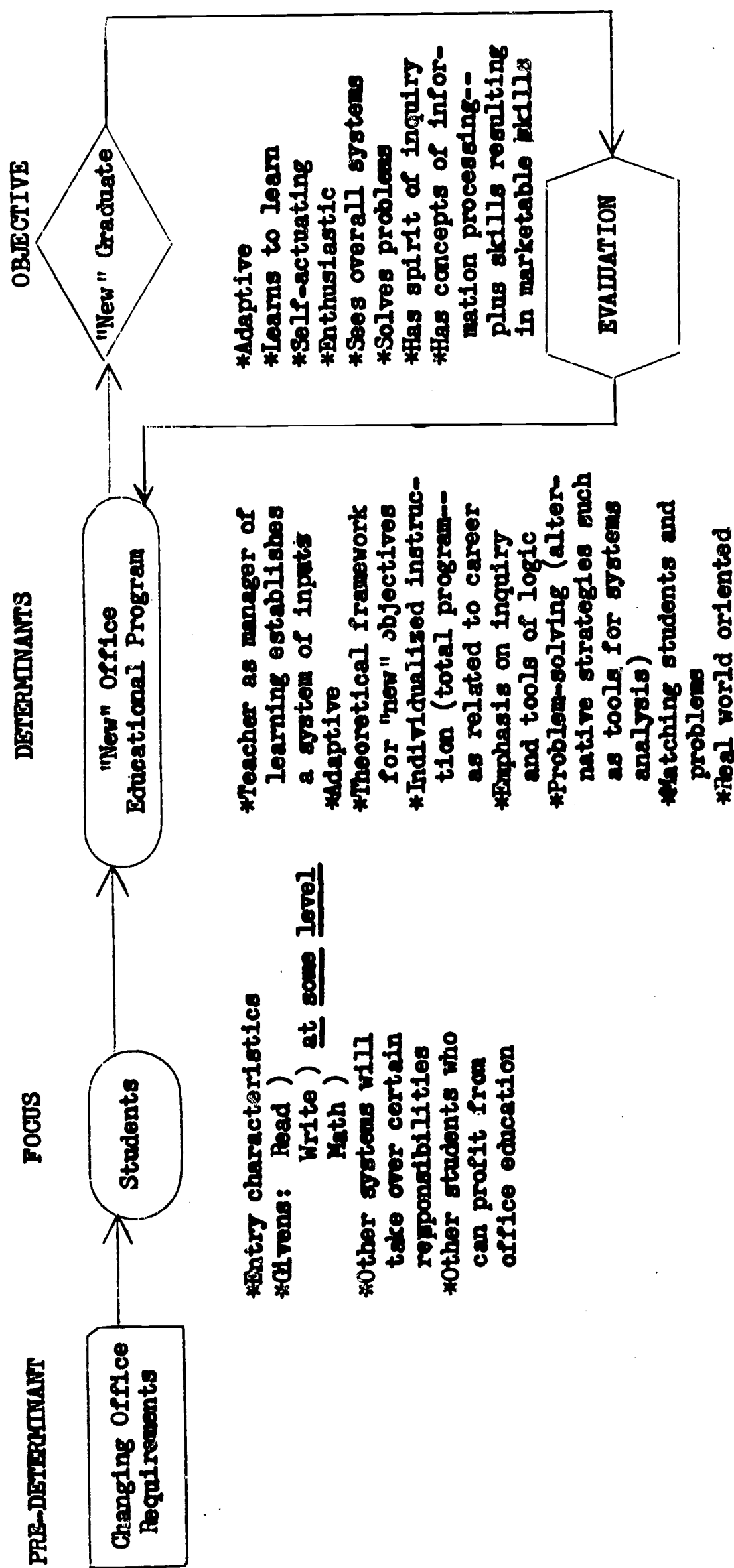   5. Implementing pilots

    D. Expected Outcomes of Phase I

VII. <u>Facilities, Manpower Budget, Organization</u>

VIII. <u>Appendix</u>

    A. Supporting reports and documents.

A SYSTEMS APPROACH TO OFFICE EDUCATION

PRE-DETERMINANT

Changing Office Requirements

FOCUS

Students

*Entry characteristics
*Givens: Read)
        Write) at some level
        Math)
*Other systems will take over certain responsibilities
*Other students who can profit from office education

DETERMINANTS

"New" Office Educational Program

*Teacher as manager of learning establishes a system of inputs
*Adaptive
*Theoretical framework for "new" objectives
*Individualized instruction (total program-- as related to career
*Emphasis on inquiry and tools of logic
*Problem-solving (alternative strategies such as tools for systems analysis)
*Matching students and problems
*Real world oriented

OBJECTIVE

"New" Graduate

*Adaptive
*Learns to learn
*Self-actuating
*Enthusiastic
*Sees overall systems
*Solves problems
*Has spirit of inquiry
*Has concepts of information processing-- plus skills resulting in marketable skills

EVALUATION

PHASE 1

Determining Terminal Behaviors

PHASE 2

Developing and Testing Modules

PHASE 3

Combining and Testing Total Program

PHASE 4

Dissemination: Information, Advocacy, Acceptance

TIME ←Oct. 28, 1967 ——May 1, 1969—— May 1, 1971, to July 1, 1967

LINE to May 1, 1969 ——→ to May 1, 1971 ——→ August 31, 1972 ——→ O N W A R D ——→

	PHASE 1	PHASE 2	PHASE 3	PHASE 4
MAJOR ACTIVITIES TO BE COMPLETED BY PHASES	A. Job Tasks—present and predicted B. Terminal Behaviors of "New" Graduate C. Tests of Terminal Behavior D. Strategy of Evaluation of System Components: students' entry, Students' at output, indexes of job market and acceptability in the job market, teacher adaptation, etc. E. Pilots to test the system F. Fundamental Research—"Adaptability"	A. Sequencing of Learning Modules B. Developing of Materials and Strategies C. Testing and Revising Modules	A. Combining Modules Into Program B. Testing Program C. Revising Program	A. Utilization of Media (all media) for Informing B. Involving Teacher Education Institutions and Teachers Through Teacher Workshops, Business Teacher Meetings, Conferences, etc. C. Involving Administrators, Supervisors, Governmental Representatives at appropriate levels, professional org., etc. D. Utilization and involvement of related disciplines and business groups E. Identification of Business Education talent

(NOTE: Dissemination began with the Planning and Feasibility Study.)

ACTIONS LEADING TO ORGANIZATIONAL STRUCTURE
DELTA PI EPSILON'S BOARD OF GOVERNORS
FOR RESEARCH AND DEVELOPMENT

Actions leading to the structure for the project and their
relation to the Board of Governors and Delta Pi Epsilon follow:

1. On February 19, 1966, the Executive Board of the National
Business Education Association made available $1'500 to begin a
series of meetings to plan for curriculum research in business
and office education.

2. A research planning conference for Business and Office
Education was sponsored by The Center for Vocational and Technical
Education at The Ohio State University from February 27 to March 4,
1966. The objective of the conference was to develop an overall
research structure with special attention to priority problems in
business and office education. The conference provided for five
task-force groups to concern themselves with the research im-
plications affecting teacher education, curriculum and program
development, evaluation, contribution of business and office educa-
tion to the preparation for new and emerging occupations, and
disadvantaged youth.

3. A series of clinics beginning in January 1966 through
June 1966 were held with a national representation of supervisors,
publishers, vocational teacher educators, business teacher edu-
cators, and others to develop guidelines for the preparation of
office occupation teachers. Over 1300 leaders in Business and
Office Education were identified and received copies of these
guidelines. The Clinics were funded through 4(c) monies and were
conducted by Wayne State University.

4. On October 15, 1966, a meeting was held in Washington,
D. C., with representatives from the Research Foundation of NBEA,
Delta Pi Epsilon, National Association for Business Teacher Edu-
cation, the National Education Association, and the U. S. Office
of Education. The purpose of the meeting was to begin identifi-
cation of the most needed curriculum research in business and
office education. At this meeting, the curriculum research project
was identified as "Moonshot."

5. On December 27, 1966, another meeting was held by the Research
Foundation of NBEA in Chicago to identify additional procedures for
establishing a major curriculum research study (Moonshot).

6. On February 6 and 7, 1967, Frank Lanham, president of the Re-
search Foundation of NBEA, and Fred S. Cook, chairman of the Research
Committee for Delta Pi Epsilon, planned with Harry Huffman and Robert E.
Taylor for a feasibility conference (Moonshot) to be held on April 16-18
in Cleveland, Ohio, with research leaders in business and office edu-
cation together with consultants in systems, curruculum, publishers,

and professional organizations to determine the parameters of the major curriculum research and development project. Plans for the second feasibility conference to be held May 7-10, 1967, in Detroit, Michigan, were discussed.

7. On February 18, 1967, the NBEA allocated an additional $1 000 for the May 7-10 meeting on "Moonshot."

8. On February 19, 1967, the DPE Executive Board supported the idea of "Moonshot" as one of the possible research topics to be developed at the DPE Research Training Conference.

9. On April 6, 1967, a meeting was held with RCU Directors to determine procedures for establishing relationships with the RCU network.

10. A grant of $2 000 from South-Western Publishing Company was used in partial support of the May 7-10 meetings.

11. McGraw-Hill Book Company granted $1 500 for the May 7-10 meeting in Detroit.

12. April 16-18, 1967, Feasibility Conference for the "Moonshot" Project in Business and Office Occupations, was held at Holiday Inn, Cleveland, Ohio.

13. May 7-10, 1967, a meeting for leaders in business and office education research was held in Detroit. At this conference, basic objectives and assumptions were reviewed in relation to the system and curriculum model building process utilizing the organic curriculum concept. The Executive Committee of the Business Education Study Committee was authorized to make appropriate project presentations and plan the organizational structure for "Moonshot."

14. June 19, 1967, the steering committee elected from the ad hoc Business Education Study Committee met to consider organizational structure.

15. June 29, 1967, "A Planning Study to Determine the Feasibility of Developing a New Business and Office Education Curriculum," funded by USOE (No. 7-1223).

16. July 30-3., 1967, meeting at Sheraton O'Hare Motor Inn, Chicago. Delta Pi Epsilon Executive Board accepted NOBELS group as the Board of Governors for Research and Development. Executive committee and principal advisory panel of the former ad hoc committee were voted to continue "Planning and Feasibility." Frank W. Lanham appointed to continue under the new organization as principal investigator. Interdisciplinary consultants presented papers on "Moonshot" (now NOBELS).

A letter dated August 5, 1967, from the president of
DPE confirming action of DPE's Executive Board on July 31, 1967,
follows:

DELTA PI EPSILON

NATIONAL HONORARY GRADUATE FRATERNITY IN BUSINESS EDUCATION

August 5, 1967

TO: BUSINESS EDUCATION STUDY COMMITTEE

After contacting the majority of the members of the Executive
Board of Delta Pi Epsilon by telephone on July 31, 1967, the
following decision was reached:

> That Delta Pi Epsilon designates the Business Education
> Study Committee composed of twenty-one business educators
> to act as The Board of Governors for Research and De-
> velopment in Business Education under the sponsorship of
> Delta Pi Epsilon. The kind of work that the Board of
> Governors plans to undertake in research and development
> in business education is the kind that the fraternity has
> been attempting for many years. The Board of Governors
> will operate independently, but will report to the
> Executive Board and the National Council so that these
> groups are informed of the plans and projects of this
> group.

Members of the Executive Board voting affirmatively were:
Ramon P. Heimerl, president; F. Kendrick Bangs, vice president;
Eugene Wyllie, treasurer; Ruth I. Anderson, past president; and
Ellis J. Jones, executive secretary. Mrs. Louis Westrick,
secretary and Mrs. Cecilia Hopkins, historian were not reached
by telephone for the decision.

The Executive Board will act formally on the above at its board
meeting on November 1, 1967.

Ramon P. Heimerl /s/
Ramon P. Heimerl,
National President

RPH: cc

17. August 5 to 8 and August 12 to 15, 1967, two 4-day writing conferences held in Ann Arbor for preliminary planning of NOBELS. Interdisciplinary consultants used in both writing conferences were Rashid L. Bashshur and Joe E. Hill.

18. August 22, 1967, meeting of NOBELS Executive Board with a panel of federal, regional, and state supervisors for business and office education at the Center for Vocational and Technical Education, Columbus.

19. September 23, 1967, meeting of the structure and organization committee of the Board of Governors for Research and Development to develop guidelines for organizational arrangement.

20. October 15-16, 1967, meeting of structural and organization committee with codirectors and principal investigator of Phase 1 and initiators of Phase 2 to consider structure and transition.

21. October 22-23, 1967, meeting of DPE's Board of Governors for Research and Development. Important actions: confirmation of actions charging advisory panel and principal investigator with developing and implementing Phase 2; election of officers and committees for actions beyond Phase 2; and vote to expand Board membership with representatives from local and state supervisors and from marketing and distributive education.

22. November 1-5, 1967, at the National Council meeting of Delta Pi Epsilon held in Minneapolis, the DPE's Executive Board and National Council ratified the action of accepting the Board of Governors for Research and Development as an instrument of that organization.

MEMBERS OF DELTA PI EPSILON'S
BOARD OF GOVERNORS FOR RESEARCH AND DEVELOPMENT

Anderson, Dr. George
University of Pittsburgh
Pittsburgh, Pennsylvania

Anderson, Dr. Ruth I.
North Texas State University
Denton, Texas

Balsley, Dr. Irol
Texas Technological College
Lubbock, Texas

Bangs, Dr. F. Kendrick
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Greeley, Colorado

Hillestad, Dr. Mildred
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Greeley, Colorado

Hosler, Dr. Russell J.
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Madison, Wisconsin

Huffman, Dr. Harry
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The University of Michigan
Ann Arbor, Michigan

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New York, New York

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Cincinnati, Ohio

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Minneapolis, Minnesota

Rowe, Dr. John L.
University of North Dakota
Grand Forks, North Dakota

Swanson, Dr. Edwin A.
San Jose State College
San Jose, California

Tate, Dr. Donald J.
Arizona State University
Tempe, Arizona

Tonne, Dr. Herbert A.
State University of New York
Albany, New York

Wagoner, Dr. George A.
University of Tennessee
Knoxville, Tennessee

Wood, Mr. Merle
Supervisor, Business Education
Oakland Public Schools
Oakland, California

APPENDIX K-3

INTERDISCIPLINARY PARTICIPATION IN THE PLANNING STUDY

A unique element throughout the planning and feasibility study has been the broad interdisciplinary base of consultant help to plan the total project. A partial list of those outside the initiators from business and office education is illustrative of the interdisciplinary meld. Some have participated as much as fifteen days in direct support of the planning and feasibility activities.

Dr. Theodore Andrews, Director, Education Research Council of Greater Cleveland

Mr. Robert D. Balthaser, State Supervisor, Business and Office Education, Ohio

Dr. Rashid L. Bashshur, Research Associate, Bureau of Public Health Economics, Department of Medical Care Organization, The University of Michigan

Dr. Bruce Blackstone, Chief, Office Education, Division of Vocational and Technical Education, USOE, Washington, D. C.

Mrs. Karen Brethower, Program Director, The Center for Programmed Instruction, Bureau of Industrial Relations, The University of Michigan

Mr. Vernon E. Burgener, Director, Research Coordinating Unit for Illinois

Dr. Edmund Gleazer Harris, Executive Director, American Association of Junior Colleges, Washington, D. C.

Dr. Edward E. Byers, Editorial Director, Gregg Publishing Division of McGraw-Hill Book Company, New York

Dr. Albert A. Canfield, Vice-President for Curriculum Research and Development, Oakland County Community College, Bloomfield Hills, Michigan

Dr. Finley Carpenter, Professor of Educational Psychology, The University of Michigan

Miss Marguerite Crumley, State Supervisor, Business and Office Education, Virginia

Mrs. Dorothy Cooper, State Supervisor, Business and Office Education, Tennessee

Mr. Weldon Ells, State Supervisor, Business and Office Education, Iowa

Mr. Albert G. Fisher, President, Eastern Business Teachers Association, Boston, Massachusetts

Mr. Everett Fuller, State Supervisor, Business and Office Education, Texas

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Mrs. Doris Graff, Assistant to the Executive Director, Administrative
    Management Society, Willow Grove, Pennsylvania

Dr. Charles B. Hicks, Professor of Administrative Management, The Ohio
    State University

Dr. Joseph E. Hill, Dean, Graduate School, Wayne State University, Detroit,
    Michigan

Dr. William Hitt, Head, Behavioral Sciences, Battelle Institutes

Mr. James Houstman, State Supervisor, Business and Office Education, New
    Mexico

Dr. M. Clemens Johnson, Research Associate, Computer Center of The Univer-
    sity of Michigan

Dr. Robert Kozelka, State Supervisor, Business and Office Education, Illinois

Mr. Robert H. Scott Leeseberg, Systems and Procedures Association, American
    Greetings Corporation, Cleveland, Ohio

Mr. Richard B. McCaffrey, Assistant Executive Director, Systems and Pro-
    cedures Association, Cleveland, Ohio

Dr. Adrian McDonough, Wharton School of Finance and Commerce, University
    of Pennsylvania

Dr. Edward J. Morrison, Formerly Principal Research Scientist, American
    Institutes for Research; currently Research Coordinator for The Center
    for Vocational and Technical Education, The Ohio State University

Mr. Richard Neumaier, Management Consultant, Glenside, Pennsylvania

Dr. John Pineault, South-Western Publishing Company, Cincinnati, Ohio

Mr. Geary A. Rummler, Director, Center for Programmed Instruction for
    Business, Bureau of Industrial Relations, The University of Michigan

Mr. Bernard A. Shilt, Vice-President, Business and Office Education of the
    American Vocational Association; Director, Business Education, Buffalo
    Public Schools

Dr. Dean H. Wilson, Director, Industrial Systems and Research Institute,
    The University of Michigan

Mrs. Marion Wood, Education Services, International Business Machines
    Corporation, New York

Dr. James Wykle, Programming Officer, Division of Vocational and Technical
    Education, USOE, Atlanta, Georgia

APPENDIX L

MOONSHOT, NOELS, NOBELS

Frank W. Lanham
The University of Michigan

Presented at Illinois State University
Normal, Illinois

March 23, 1968

I've been trying to rationalize the value of my lecturing to you early on a Saturday morning about a topic that you, the listener, have had little choice in selecting.

As a person who believes that education is changed behavior toward a goal, I've often wondered (as you have) about the changed behavior that results from lectures, lectures that demand nothing more than listening. Consider, for example, my lecturing to you this morning about NOBELS. Is it worth it? Isn't there some better way than lecturing? Couldn't I have sent my lecture to you by tape or even videoscope? How much of what I'm going to say will make a difference in your behavior? If this lecture is important, couldn't we have remained at home, you with a television implanted in the ceiling of your bedroom as you watch in a prone position and I, in my most fetching lounging pajamas, also in a prone position, with video camera in the ceiling? If I didn't put myself to sleep under these conditions and with what I'm going to say, at least you'd have control over the off button of your cathode ray tube to rid yourself of my lecture and go back to sleep. Doesn't this improved method of lecturing sound inviting?

In a way, NOBELS is all about teaching improvements that could and will be introduced in learning, improvements in strategies of teaching and learning that will not be introduced, I'm sorry to say, this morning. While you can mentally shut me off, I'm going to lecture--I have an urge to speak about NOBELS and to be heard.

I propose that you can ward off any ill effects of my lecture by doing some mental exercising after you leave here this morning. This mental exercise is a promising solution to help rid yourself of any excess mental tissue I may contribute. This mental exercise may even bring about stimulating ideas which in turn will result in energy to modify your teaching behavior. At least, this is my hope.

This follow-up mental exercise proposed is suggested in the selected bibliography in the materials handed to you. A commitment before you leave here this morning to do some follow-up reading will make my lecturing worthwhile.

With that in mind, let's get to the subject of NOBELS.

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Moonshot, NOELS, and NOBELS are synonomous terms. Each refers to a national curriculum renewal project in business and office education. Moonshot was the first name used to represent activity toward curriculum renewal in our field. Moonshot was an appropriate first name because it represented a massive force directed into the unknown. And believe me, those of us responsible didn't know where we were going. Yet, all of us believed that a massive moonshot effort was needed to improve curriculum in business and office education.

NOELS was the second title for the curriculum project, a rather Christmas-like title, to be sure. It stood for New Office Education Learnings System. Because of the Christmas-like sound, (NOELS equals Christmas which equals gifts) concern was expressed from some that a congressman might see the term, NOELS, and unthinkingly say, "Oh, NOELS, yes--this is another Christmas gift from the USOE to a bunch of business educators."

Thus the name of NOELS was changed to NOBELS, New Office and Business Education Learnings System. This change to NOBELS from NOELS has the advantage of making the project a prize, a NOBEL prize, rather than a gift. NOBELS is the current name of the project, and my task today is to talk with you about NOBELS.

In case I don't get around to it later, let me briefly describe the status of the project to date. The project was funded as a planning and feasibility study by the USOE last June 29. The initiation of the project was the Research Foundation of the National Business Education Association supported by Delta Pi Epsilon's Research Committee, the Center for Vocational and Technical Education at The Ohio State University and others.

Last May, a group of some 21 business educators, brought together for their competency in research, organized themselves as the Business Education Study Committee. It soon became apparent that the structure for a massive curriculum project would need to be one with which all segments of the profession could identify. As a result, Delta Pi Epsilon tendered an invitation to the Business Education Study Committee to become a part of DPE but not to be controlled by it. Thus, Delta Pi Epsilon's Board of Governors for Research and Development was born with Dr. Larry Erickson as the current chairman. The original 21-member list, incidentally, has now been expanded to include state supervisors, city supervisors, and distributive educators. You'll be hearing a great deal about the Board of Governors in the future.

But back to the funded project that started on June 29: the planning and feasibility study. I have the good fortune of being principal investigator. My advisory board and prime movers in the project are Messrs. Bangs, Calhoun, Cook, and Huffman. Our time since June 29 has been spent in determining feasibility and, with that determined, planning next steps of the NOBELS project.

A by-product of planning has been a proposal, the Development of Performance Goals for Business and Office Education, submitted to USOE. Hopefully, we will know by early April whether or not we are funded through USOE.

In any next steps, as was true in the planning and feasibility study, the Center for Vocational and Technical Education at The Ohio State University continues as prime contractor; and I will continue as principal investigator supported by the advisory committee mentioned and DPE's Board of Governors.

You will hear a great deal about performance goals today. I've set performance (or behavioral) goals for my presentation here. These goals may serve to illustrate what we mean by a performance goal as well as demonstrate that I do believe in practicing what I preach. Actually, I have two performance goals for myself this morning, both listed in your handouts: one is a cognitive goal and one is affective, following Krathwohl's and Bloom's taxonomies.

The cognitive goal is this: Given a captive audience as you, I will describe in unambiguous and concise terms the NOBEL system as a learnings model. My criterion of success (and every behavioral goal should contain its method of assessment) is this: Your questions following my discussion will be questions of substance and not of terminology.

My second performance goal, the affective one, relates to the value of what we're doing in NOBELS. And the heart of what we're trying to do in NOBELS depends upon meeting this goal. Here's my second goal:

Given a captive audience such as you, you will exhibit positive feelings toward the potential of NOBELS as evidenced in two ways: (1) in group discussions following this lecture, you will explore further the implications of your developing performance goals for your own business, distributive, or office classes, and (2) you will commit yourself before leaving here this morning to use the bibliography handed to you in order to do additional reading and thinking about a behavioral approach to learning.

So there you have my two performance goals for this morning. Let's see how close we can come to achieving them.

To the cognitive side of NOBELS, what are we up to? Among your handouts, you'll find one page labeled Analog System Model for NOBEL. You'll also find definitions of terms. Now, let's take the mystery out of this system model.

There's really nothing too startling about the NOBELS model. It's a model that agrees with your current notions of what education is all about. For example, "design criteria" is nothing more than your overall philosophy of education stated in an operational way. It's in this last phrase, "stated in an operational way," that NOBELS design criteria differ from usual statements of philosophy. Here's what I mean:

We all know how important it is to have a statement of educational philosophy--beliefs about boys and girls and the way they learn. Every school system represented here today has a statement of philosophy. Of course, in Michigan schools at least, these statements of philosophy are so broad in their generalization that they give very little direction to action in a school. Consider these examples of current philosophic generalizations: "We believe in individual differences"--this statement is

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almost like being for motherhood and marriage. The trouble with such a generalization is that it fails to give us any clues on what our belief will cause us to do differently in working with boys and girls.

Consider this philosophic generalization: We believe in "taking the student from where he is" (as though we could take him from where he isn't) "to where he should be." All of us believe whole-heartedly in this generalization. Yet, again, the statement fails to identify specifically how to determine where the individual is and where to take him after we know.

Then, again, we define education as "changed behavior toward a goal." Yet, we fail to specify the goal or fail to specify what changes are needed. We don't even recognize what the student's beginning behavior is like.

Instead of such generalizations, NOBELS demands specificity. Here's one example of how we can state what we believe in a design criterion. Notice that this statement is in behavioral terms.

In the NOBEL system, the beginning behavior of each student will be assessed in terms of his motivation, his personal history, and his aptitudes in order to provide learning goals appropriate to his ability to learn and to apply these goals in a strategy of learning that represents an appropriate pace and style. Assessment of this goal will be made by examining numbers and kinds of instruments used in determining entry behavior and the gain scores resulting from learning.

The design criteria in the NOBELS model such as our example will force us not only to say that we believe in individuals and the importance of individuals; but it also provides a mechanism for putting our beliefs about boys and girls into practice.

Thus, the first part of our flow chart is understood as specific behavioral or operational statements about our beliefs of what learning program should do for boys and girls. Do you begin to see how NOBELS is different?

Let's go on. Let's look at the NOBEL system model again. Given some operating definitions or design criteria about the overall system of learning, the model calls for the specification of performance goals (or behavioral goals) to be achieved in learning.

I have included among your definitions what we mean by a performance goal. You are probably familiar with the work of Mager and other behaviorists. Briefly, the statement of a performance goals contains three parts: 1. the task to be performed stated in action verbs, nouns, and modifiers; 2. the conditions influencing the task to be performed; and 3. the criteria for assessing successful performance. Let me illustrate: "A boy 14 years of age runs the 100-yard dash on an asphalt track surface with not more than five miles of headwind in 13 seconds or less." The task for the 14-year old boy? "Runs the 100-yard dash." The conditions? "An asphalt track surface and five miles of headwind." The criterion of success? In 13 seconds or less.

... Canfield, a behaviorist formerly at Oakland Community College in ... from whom this example was borrowed, added a fourth element to ... performance or behavioral goal. He calls it the "rationale." To the statement "... boy 14 years old runs the 100-yard dash on an asphalt sur- face with not more than five miles of headwind in 13 seconds or less," he adds: "in order to learn how to elude the police."

The rationale, of course, is "in order to learn how to elude the police," or some other reason for a student's wanting to develop this be- havior, such as "in order to develop a wholesome avocation" or "in order to develop a strong body." Whatever the reason, Canfield holds, if known by the student, becomes motivation or purpose for wanting to develop the performance.   •

Let's relate what I've just said about performance goals to NOBELS. Suppose that for the office occupations now held by 16 through 24 year olds, we determine the tasks currently performed or likely to be performed in emerging occupations by collecting data from the real-live world of current and emerging office jobs. Suppose further that these tasks are stated in behavioral terms. Such a project would provide office and busi- ness teachers with an inventory of goals necessary for entrance by all students in all office work, now and in the immediate future. The develop- ment of this inventory of office performance goals is the next step of NOBELS.

When completed, we will have an inventory, a total inventory, of per- formance goals necessary for office occupations--stated in terms of tasks, conditions for performing the task, and criteria of successful performance. From this total inventory, curriculum developers can select a set or sets of goals appropriate to the needs of particular students as new office and business education learnings programs.

Lest those of you in distributive or other areas of vocational edu- cation feel left out, let me add that we see NOBELS extended to New Of- fice and Distributive Education Learnings (NODELS). Or the generality of the system is applicable to all areas of education as evidenced by the some 17 school districts now participating in "Educational Systems in the '70's."

How does the next step of NOBELS differ from what we are now doing? ... to develop these specific goals of performance? Here's one reason:

Albert Einstein once said: "Our age is characterized by the perfection of means and the confusion of goals." From confusion to clarification of specific goals for business and office education is the major outcome of our next step of NOBELS.

In looking at current business and office programs, your programs, the fault is not that goals are lacking; rather, broad generalizations or dimly implied goals provide ambiguity of what to expect of students on the part of teachers or what direction to follow in learning on the part of students. As Tyler says, ". . . many (teachers) have not carried beyond

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the point of selecting the content to be presented. They have not con-
sidered carefully what the students are to do with the content. In such
cases, students commonly believe that they are to memorize all or impor-
tant parts of the content and other objectives involving behavior other
than memorization are not developed." From over 100 students interviewed.
Tyler reports that almost all students found out what they were to learn
from three sources: textbooks and workbooks, what the teacher did in class,
and the advice of other students. Specifications require clearly-defined
performance goals, stated in terms of the learner's behavior and stated,
if not in measureable terms, at least in terms that allow the assessment
of achievement.

So that brings us to the third part of our model, "Inputs (Outputs)"
or in other words with which you are more familiar: means or methods,
material, machines, manpower or the combination of methods selected be-
cause of their potential to help a learner achieve the goals.

I suspect that the greatest contribution to changed programs by NOBELS
will be in changing the "Inputs." Here we are in this room this morning.
I'm lecturing to you when I could just as well have put my talk on tape
and let you listen to my words.

NOBELS will change the role of the teacher from that of a "knowledge
dispenser" to "a manager of learning." With our new technology on the
threshold, we'll let machines--hardware and software both--do what machines
can do equal to humans but then we humans freed from the routine and some-
times monotonous tasks, we will do what humans can do best. And I sus-
pect we'll find that the human teacher can motivate, diagnose, arrange
new learning experiences. These are some of the tasks that I think, we
can do better than machines. The NOBELS' message is this: Teachers dare
not continue to dissipate human energy on activities that other means can
do equally as well. Too many other important activities remain for teachers
to expend their energy on tasks that do not pay off.

Thus, managing and applying the learning (the Inputs) yields Outputs
in terms of behaviors--behaviors in real live boys and girls that can be
assessed in terms of success criteria developed with the goals selected
for learning.

And through our feedback circuitry, we analyze the difference between
what was said we wanted boys and girls to achieve and what they did achieve.
This analysis causes us to evalute our philosophy, our goals, our manage-
ment of methods, materials, and machines used for learning, and as neces-
sary, to modify them.

That, then, is what we mean by the NOBEL system model--an analog
model which helps us to systematically determine what is to be learned,
how it is to be learned, how well it was learned, and how hindsight helps
us to modify the system so that the next time through, improvements will
be made

Again, NOBELS is not too much different from what you now believe is
good education. Its advantage over most learning is the systematic way in
which we can evaluate, assess, and improve our teaching.

Let's take a look at the second performance goal I set for myself:

The conditions: Given a captive audience such as you.

The task: Exhibit positive feelings toward the potential of NOBELS.

The success criteria, remember, are twofold: (1) In small group dis-
cussions, you will discuss further the implications of your developing per-
formance goals for your own classes, (and) (2) You will commit yourself
before leaving here to using the bibliography to do additional reading
and thinking about this behavior approach to learning.

My task in the few remaining minutes is to persuade you toward a posi-
tive set about NOBELS--an affective tone which will cause you to begin to
value the ideas in this systems model.

At the outset, to lead you toward valuing NOBELS, performance goals,
FS 70, or any other modification in your current mode of teaching is a
most difficult task, yet a most critical task that must be accomplished
if NOBELS is to be accepted and practiced by you in your classrooms.

Perhaps the strongest generalization I have made during the planning
and feasibility study is this: Teacher educators, first of all, must be-
gin to value the systemic approach and include this approach, as well as
the necessity of developing performance goals in their teaching; and
teacher education programs must reflect the behaviorist's approach to
learning.

Yet, classroom teachers, you who are now practicing, can begin to
value and use this approach. I suspect that just committing yourself to
do some reading, the kind of reading suggested in your bibliography, will
cause you as it has caused me to value the potential of NOBELS over what we
are now doing.

What I'm saying is this: the knowledge you glean from a depth of read-
ing and thinking about NOBELS (or the cognitive) will lead you to a valuing
of NOBELS (the affective). But I do not base my case on this one activity
alone--important as it is.

It may seem strange to you that I do base my case this morning on some
elusive behaviors of teachers that are not yet capable of being written in
the form of behavioral goals. I refer to those elusive patterns of actions
that are frequently caught and not taught--yet actions which when caught
from a teacher may be the most significant and long lasting behavioral
change in an individual. I'm talking here about characteristics, traits,
and attitude development in a student. Let me illustrate. Paul was the
bad boy in school. Because Paul was a bad boy, he and I as the newest
teacher in the district drew many a ninth hour together: his an punish-
ment for his misbehaving and mine as an extra duty. Suddenly, Paul be-
came almost a model student. Straight B average, all state track star.
His total attitude had changed toward himself, toward school, toward teachers,
toward students. Why? He gave credit to a chance remark I had made in one

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of our numerous ninth hour sessions. I'm sure we had talked about many things, but the change, he said, had been brought about because among many other things I had said was: "Paul, you know if you keep on as you are making life miserable for others, people won't like you." I guess he wanted to be liked, and this chance remark on my part--caught out of a context of many remarks--made a total change in the behavior of Paul. More than the attainment of one behavioral goal, all future learning was changed. Why? He perceived every problem, himself, his associates in a different way than he had previously because he <u>was</u> a different person. Perhaps the most critical elements of teaching and learning someday will be identified as characteristics that are caught and not taught.

It's fortunate in illustrating further my meaning that we're here to do honor to a teacher, a great teacher today. Since I am too much of a contemporary of this great man, I did not have the opportunity to be in his classes as many of you have. But he has carried on in the great tradition of those who preceded him here at Illinois State University--teachers with whom I studied, teachers who were significant individuals in my growth and development. I refer to A. R. Williams, Alta J. Day, Harry Admire, Margaret Peters, Mary Webb, Harold Koepke, and others. Please, any of you whose name I have just called, I'm not being disrespectful in using your first name. I suspect that any significant teacher is likely to be thought of by a student in more familiar terms than he would normally use in conversing with that teacher. And I think of you who were so significant to me on a first-name basis.

A. R. was department chairman, the position held by the person we honor today. A. R. Williams taught me respect for thinking and, at times, disrespect for the printed word. I had three or four classes from him. In advanced accounting, he punctuated our class with live case material from his own consulting practice. In law, I remember one examination when I was less prepared than I should have been--it was in a summer session class and the competition was rough with all those experienced teachers in the class. We'd call them DAR's today, dammed average raisers. Because I hadn't studied enough, I had to reason my way through one of the cases he gave on the exam. He reinforced my attempt. How excited I was when my exam grade was about 10 points higher than one of the DAR's whom I held in some awe. Yes, A. R. helped me to learn how to think--and that covert action of thinking is difficult to capture in a behavioral goal.

Harry Admire? I learned from Harry a certain zest for living. Talented singer that he was, at times in his accounting class, he'd throw open the windows, have us all stand and practice breathing with him--in an accounting class. With Harry, that kind of behavior didn't seem strange to me at all. Furthermore, every Monday morning, following an inspiring sermon at church the day before, our class was a resume of the sermon he heard. I don't remember one of the sermons he summarized for us, but you know, I don't believe our accounting suffered because of these distractions. What did I catch from Harry? An attitude toward living life to its fullest, an attitude toward quality living.

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Alta J. Day? She recognized individual differences. Why, she rejoiced as much the day I made my 100 words per minute in shorthand as she must have the day she had passed her own 200 words per minute. What did I catch from her? A respect for high quality and a determination to develop quality goals but also affirmation for the best we could attain. Many of her humanitarian qualities transcended the classroom, too. I know of several who could not have completed their education without the financial support she gave them.

And so I could go on with anecdotes about all these great teachers-- teachers who have been significant in influencing my behavior. But my purpose is to illustrate why you should believe in NOBELS. In the nutshell, here it is:

Let's free teachers from the routine, the monotony of teaching so that they can do what human beings can do best. Let's begin to narrow down those currently unmeasurable characteristics, traits, or attitudes that are so elusive by defining what we can define in behavioral terms-- but then, in narrowing the field of these critical behaviors that now must be caught and not taught--perhaps more of us can become significant teachers to an increasing number of our students.

My message in closing--Try NOBELS in your classroom, try writing some performance goals following the specificity of behaviorists, do some reading about NOBELS from your bibliography. If you do these things, I'm sure you will develop, as I have developed, an appreciation of the value the ideas behind NOBELS can have in influencing learning.

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A Planning Study to Determine the Feasibility of Developing a New Business and Office Education Curriculum: Moonshot--an Office Occupation Curriculum. FINAL REPORT

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ABSTRACT
The planning study involved developing a feasible plan for a New Office and Business Education Learnings System (NOBELS). An analog system model was developed as the framework in which NOBEL would be tested. The next step in NOBELS was determined as developing a set of performance goals to represent business and office job tasks.

Four criteria of feasibility were applied to the plan eventually accepted with these results: (1) It is a plan supported by the professional leadership. (2) It was developed through interdisciplinary thought. (3) A professional and operating structure have been effected. (4) Dissemination and plans for identification of disseminators, advocates, and acceptors are included.