DOCUMENT RESUME

ED 134 405 SE 021 385

AUTHOR Golts, Uldis R.
TITLE A Descriptive Analysis of the Del Mod System's Field Agent Component, Final Report, Volume III.
INSTITUTION Del Mod System, Dover, Del.
SPONS AGENCY National Science Foundation, Washington, D.C.
PUB DATE Jul 76
NOTE 129p.; For related documents, see SE 021 383-387; Contains occasional light and broken type

EDRS PRICE MF-$0.83 HC-$7.35 Plus Postage.
DESCRIPTORS *Change Agents; *Curriculum Development; Elementary School Mathematics; Elementary School Science; *Elementary Secondary Education; *Inservice Education; *Mathematics Education; *Science Education; Secondary School Mathematics; Secondary School Science; Teacher Education
IDENTIFIERS *Delaware; Field Agents

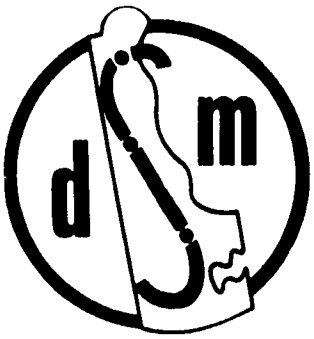
ABSTRACT

This monograph describes the field agent of the Delaware Del Mod System. The following sections are included in the report: (1) The Duties and Activities of the Del Mod System Field Agents; (2) The Field Agents' Mode of Operation; (3) The Conduct of Projects; (4) The Hiring and Training of Del Mod Field Agents; (5) The Administration of Del Mod Field Agents; (6) Goals and Impact; and (7) Description of Field Agent Projects. The report indicates the field agent concept was very effective and could work in other states. (RH)

del-mod system

1971-1976

STATE OF DELAWARE



A Descriptive Analysis of the Del Mod System's Field Agent Component

By Uldis R. Golts

Foreword by John R. Bolig

FINAL REPORT

VOLUME III

A DESCRIPTIVE ANALYSIS OF THE DEL MOD SYSTEM'S FIELD AGENT COMPONENT

by

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July 1, 1976

Charlotte H. Purnell, Director

Dr. John R. Bolig, Director of Research

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FOREWORD

If the Del Mod System fostered one idea that was ahead of its time, it was the field agent concept. The agents were educational Johnny Appleseeds, welcome in virtually every classroom in Delaware, and often their job was done and they were gone before teachers realized the debt of gratitude owed them. Many factors contributed to their success, not the least of which was the non-threatening nature of their work ... they did not evaluate or in any way pass judgement on the teachers with whom they shared their knowledge of science or mathematics.

The earliest Del Mod proposals called for considerable data collection and report writing by the agents. These duties were an obvious hindrance to their effectiveness, and this writer became sympathetic to their complaints. The requirements were eliminated with the understanding that any evaluation would be conducted by Del Mod's research office. The administrators of Del Mod fully subscribed to this alteration in the field agent job description.

In October of 1974, Uldis Golts was employed by Del Mod to serve as a technical writer whose prime function was to gather data and perceptions of the field agent aspects of the System. The Research Director and Mr. Golts outlined the form of a final report and this was approved by Del Mod's governing boards. The report was to be descriptive, scholarly, and comprehensive.

Mr. Golts' task was not an easy one. The field agent program had two distinct phases. The first phase, lasting three years, was the important one because the philosophy and administration of the field agent concept became solidified. The period was exciting because the program was innovative and the agents were extraordinarily enthusiastic about their work.

The second phase began in September, 1974, and it brought with it a dampening of spirit. The program responsibility was shifted from the office of the Director of Del Mod to the office of the University of Delaware's Component Coordinator. The shift was made in the hopes that the University would continue the program beyond the end of Del Mod funding in 1976. The new director of the program worked hard to accomplish this goal, but without a promise of funding, he failed. The field agents, because they were now working in a university milieu, were required to write reports and account for their time. They also began to look for new employment.

It is my perception that the program was an outstanding and noble experiment. The field agents were marvelous people, and they made Del Mod an exciting project. In retrospect they never should have been shifted to the University because the one person who made the program work was Mrs. Purnell, the Del Mod Director.

Mr. Golts' study is descriptive and technical. It is a handbook on how to conduct a field agent program. It is only flawed in one respect ... there is no way to capture on paper the spirit and dedication of the people who made it work.

John R. Bolig
Director of Research

INTRODUCTION

Del Mod's hope of improving the teaching of science and math stands and falls with the effectiveness of its field agents. This volume endeavors to describe and evaluate all significant aspects of the Del Mod field agent component. Generous amounts of footnotes at the end of each chapter will steer the interested reader to further information pertaining to the Del Mod field agent component.

In writing this volume, I have perused all pertinent Del Mod documents and have interviewed all current field agents and other key Del Mod personnel. Since I have been associated with Del Mod only since the fall of 1974, I have found it wise to exclude from specific discussion any field agents whose term of service with Del Mod terminated before that point in time. To gain a more personal insight in the field agents' approach and philosophy, I have accompanied each field agent on his job and have attended many of the field agents' monthly meetings.

I have tried to produce a thorough and objective report. The fact that I am thoroughly impressed by the field agent idea and the effectiveness of the Del Mod field agents should not be regarded by the reader as a lapse into subjectivity, but rather as a spur in his side to further the Del Mod field agent idea elsewhere.

U.R.G.

CHAPTER I

THE DUTIES AND ACTIVITIES OF THE DEL MOD SYSTEM FIELD AGENTS

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THE DUTIES AND ACTIVITIES OF THE DEL MOD SYSTEM

FIELD AGENTS

Del Mod thinks of its field agents as its "working arm" and its "grassroots contact" with Delaware's mathematics and science teachers.[1] Besides being specialists in either science or mathematics education, the field agents are also knowledgeable in curriculum planning, materials, teaching strategies, and interpersonal relationships.[2] Since their strategies are scrupulously noncoercive, they may be generally regarded as advisory specialists. In Del Mod publications, their duties are often compared to those of the agricultural extension agent.[3] Similarly to the extension agent, Del Mod field agents fill the need for disseminating the ideas and findings of experts to those sectors of society where such ideas might be needed, appreciated, and implemented. A similar function is performed by most of the typical field agent groups such as the Peace Corp and Vista.

The concept of Del Mod field agents was discussed publicly for the first time at the Del Mod conference on September 18, 1970, nine months before the official start of Del Mod. This conference was attended by representatives from the three public institutions of higher learning in Delaware, from all of the school districts, from industry, and from the Department of Public Instruction.[4] At this meeting, all participating groups readily recognized the importance of the field agent's role, perceiving him as "the key person to keep communications flowing, to interpret needs, and to disperse information."[5] Yet, no specific idea emerged for a field agent's job description. Generally, he was seen as a coordinator without administrative responsibilities. His primary responsibility was to be a "teacher of teachers", and his main skill was to be an "ability to establish rapport with teachers and administrators."[6] The participants of the Del Mod conference also felt that each field agent should have a "territory" so that all teachers in that area would know who he is and that he is available to assist them. The participants suggested that the field agent should tactfully point out and assist in correcting any weaknesses that the district might have since "many teachers do not recognize their problems."[7]

The original Del Mod proposal to the National Science Foundation listed the following general objectives for the Del Mod science field agents:

1. Establish a liaison between the institutions of higher education, research centers, curriculum projects, state agencies, and the classroom

teacher within designated levels and geographic areas.

2. Construct, adapt or utilize any techniques needed to improve teacher competencies.

3. Conduct a wide variety of inservice activities designed to meet the needs of science teachers as determined by baseline data study, conferences with local supervisors, the state science supervisor, teachers, and others.

4. Disseminate information about and serve as implementors for materials and methods developed by curriculum projects of the Del Mod System and other institutions.[8]

The field agent's duties were enumerated in a somewhat more concrete fashion in the following job description that was issued when Del Mod began looking for likely field agent candidates:

1. Together with the director, following the identification of needs and establishment of priorities by the Advisory Committee, plan implementation strategies for meeting needs of target population designated for the agent.

2. Devise strategies, materials, methods of satisfying the needs of the target group.

3. Utilize all of the resource center materials to fulfill needs of the target group.

4. Interpret to teachers the intent of a resource center and stimulate the teachers to use the centers.

5. Visit individual teacher classrooms of the target group to follow through with strategies developed in group sessions and give advice and counsel where needed.

6. Keep abreast of latest findings in research, curriculum development and science education.

7. Be responsible for maintaining accurate records of techniques, successes, failures, and any test results of target group.

8. Meet periodically with Project Director, Advisory Committee, and omponent coordinators to review program with target group and plan future strategies.

9. Provide constant feedback data on needs, problems, and assessment of individual competencies.

10. Construct an open communication channel between state agencies, university/college and the classroom teachers so that a constant flow of information is maintained (liaison).[9]

This list of duties remains in effect with some small administrative changes. In July of 1974, as part of Del Mod's overall phase-in plan, the field agents became directly supervised by a specially appointed director for the field agent component. Also, the now defunct Advisory Committee's role in the above job description has been assumed by the Coordinating Council for Teacher Education, consisting of administrative representatives from Delaware's institutions of higher learning and from the Department of Public Instruction.

The above job description is as close as Del Mod has decided to come to specifying the duties of its field agents. From the very beginning, Del Mod's philosophy has been to entrust the field agents with considerable freedom in defining and carrying out their own roles. One field agent defines the role as "an external agent aiding teachers to master the skills identified by the teachers, themselves, as important and needed."[10] Some field agents distinguish two levels of field agent activities. On "level 1", the field agent concentrates on selling "sciencing", i.e., on encouraging teachers who are "afraid of science".[11] At this level, the field agent works with about a dozen teachers at a time at workshop sessions. On "level 2", the field agent's activities center on the improvement of teaching strategies of teachers already confident about the subject matter. At this level, the field agent may arrange full-day inservice sessions, introduce new curricula and methods, do classroom demonstrations and observe the teacher's classroom performance.[12]

The activities of the Del Mod field agents may be summarized into the following general categories:

Teaching of Methods. This aspect includes material presentation as well as teaching-techniques and classroom management. The Del Mod field agents concentrate on improving the techniques that each individual teacher feels most comfortable with. At the same time, they unobtrusively steer the teacher toward more "hands on", laboratory type experience.[13] Needless to say, this requires great flexibility and a sensitivity for each teacher's individuality. All six of the present Del Mod field agents are involved to a considerable extent in these activities. Agents agree that assistance with classroom management is mostly needed by new teachers. They have found that classroom management problems usually have to do with the teacher's approach and organizational management. According to one field agent, teachers with such problems hesitate to say outright that they have trouble; instead, the field agent has to be sensitive enough to perceive the teacher's need for assistance from such seemingly casual statements as "I'm tired" or "I've a headache."

Several field agents point out the delicate nature of the task of assisting in this area. One agent points out that a teacher will accept help in classroom management only after the field agent has earned the teacher's confidence by first providing effective assistance in other areas. Another agent maintains

that the teachers who have taught for a while want the least advice. They have established a classroom situation that, even if still far from ideal, is acceptable to them, and they don't want to tamper with it.

Field agents are quite involved in assisting teachers with the presentation of materials. For one agent it is "one of the top things." Another agent makes a point of introducing and demonstrating new hardware to teachers, particularly if the item is inexpensive and child oriented. Only two agents are currently less involved in material presentation than they have been in the past. One agent has never demonstrated a teaching technique directly with school children. He prefers to teach the teachers in a workshop, pretending that they are the students, but he also asks them to continually evaluate whether what is being done with them would work with their students. He then follows up by visiting the teachers to see how they are doing in their classrooms. Another field agent uses a diametrically opposed approach - he demonstrates new techniques directly with the students, then invariably gets the teacher to assist with, or to conduct independently, the demonstrated technique.

Material Selection All Del Mod field agents are actively assisting the teachers with material selection. Their task is immensely facilitated by the existence of three strategically located Del Mod math and science Resource Centers. These centers are resource libraries for teachers, student teachers, and field agents where they may "examine or borrow on a limited basis, materials and equipment, textbooks, trade catalogues, films and other audio-visual material and other items."[14] One agent is much more involved in material selection than the other agents. Since local ordinances dating from the early part of this century strictly regulate who may have access to the teachers, he also functions as the official district science supervisor and carries all the administrative authority that goes with that title. He initiates all material selection, including textbooks, and has to approve anything bought for science courses in his district. He is a field agent in name only. His duties are strictly those of a science supervisor and will, therefore, not be further discussed in this report. Del Mod's other field agents carry no such authority and their involvement in material selection is limited to consultative assistance.

Information Dissemination The most important task of the Del Mod field agents is to carry various types of information to the teachers. They accomplish this task both in direct contact with the individual teacher and, more formally, via workshops, seminars, labs, courses, written notices, letters, and items for the school bulletin board. The field agents are the chief disseminators of materials from Del Mod Resource Centers and curriculum projects. The following are revealing comments made by different field agents about information dissemination:

"Recently I told the principals in a school district about special Del Mod courses that they did not know about... I usually carry information directly to teachers. I try to by-pass the administration. The administration often does not forward Del Mod information in an effective way... I serve as a messenger between resource centers... I carry curriculum project information between schools... In my opinion, communications is the name of the game..."

"I share monthly reports of my activities with institutions of higher learning. I also send them Del Mod monographs... The Resource Center where I am stationed issues a newsletter in which new worthwhile projects are listed under the heading 'What Works for Some.' I make curriculum plans from other schools available to all curriculum planners... Field agents are disseminators of information. It's part of their performance contract."

..."The Del Mod field agents also worked on and disseminated Equinox, The Delaware State Natural Science Curriculum Guide, issued by The Department of Public Instruction."

"Through seminars that I used to run, I became aware of the fact that middle school teachers needed more math background. I informed the university math department and got them to set up a math program for junior high teachers... I also convey ideas from resource centers to schools. I have arranged for scheduling committees to visit other schools... While working on the Equinox reactions to preliminary copies..."

"I provide information to teachers about Del Mod courses at the University of Delaware. I also inform them about the Resource Centers."

"I have told teachers about Resource Centers... I serve as an information carrier, especially from school to school and from teacher to teacher."

Curriculum Planning Del Mod field agents are generally more involved in curriculum planning now than in previous years. One field agent explains that "you have to engage in classroom management, material selection, and material presentation first, only then can you start with curriculum organization." Another field agent agrees: "Initially I did not do so much of it, but now a substantial amount of my time goes into curriculum planning." Only one agent denied being heavily involved in curriculum planning.

Keeping Up To Date Since field agents are information disseminators, it is axiomatic that they should keep up to date with the latest innovations in science education. The Del Mod field agents keep abreast of what's going on in science or math education mainly by reading professional journals, such as Science and

Children, The Science Teacher, and the Arithmetic Teacher Journal. They also attend various local and national conferences, conventions, and meetings. Most of the field agents are taking graduate courses. They are learning about new successful ideas by visiting classrooms, schools, and specific programs in action. One field agent obtains much new information from his Resource Center librarian. The librarian functions as a "clearinghouse" for him. He states: "My Resource Center librarian is really much more than a librarian. She makes me aware of new things and methodologies that she comes across in the Resource Center. She asks me about new items, thus forcing me to form an opinion about them." The field agents, of course, also belong to various professional associations.

Paperwork The field agents are all very pleased at not being tied down with too much paper work. They much prefer using all available time in direct contact with the teachers. The field agents are specifically required by the Del Mod System to write a monthly report and a monthly projection of their activities. Until recently, a brief catch-word outline of their various projects was considered to fulfill this requirement. The field agents consider the monthly report and the monthly projection as the only required paperwork, although one field agent says that there is also "a low key mandate" for the field agents to "write up" the courses that they may be teaching. The agents seem to be generally unaware of the requirement for maintaining "accurate records of techniques, successes, failures, and any test results of target groups", as required by point seven in the previously quoted field agent Job Description. When I asked about this requirement, I was told by one agent: "Don't ask me anything about the original (Del Mod) proposal - I haven't read it." Others stated that testing and reporting simply would take too much of their time. Nevertheless, all field agents do keep various additional records. One field agent has had his work anonymously evaluated by teachers and principals and has shared those evaluations with the Del Mod director's office. Another field agent records all of his Del Mod activities in a diary. One agent does a pre-and post-analysis of each project that he is involved in, and several agents "once in a while" write reports to the districts in which they have been working.

Most of the field agents have at irregular intervals produced publishable materials in the form of Del Mod monographs, journal articles, and papers for conventions. One field agent has written a substitute manual, two agents are article referees for professional journals. Several have given science oriented speeches to various civic groups and at faculty meetings. All Del Mod field agents are carrying on job-related correspondence, although only one field agent claims to do "quite a bit" of it.

The field agents are reluctant to take on any more paperwork since they feel that additional record keeping would infringe on the time they are spending serving the needs of the teachers. They see it as more important to assist the teachers as best they can, rather than to take some time out to document the extent of their impact. Nevertheless, the new field agent

coordinator has cautiously but systematically increased the field agents' record keeping activity. He has requested that each agent keep a standardized hourly log and that copies of it be submitted to him regularly for purposes of cost and efficiency analysis.

Workshops Workshops are conducted in response to group requests and provide the participating teachers with increased content background and with ideas for classroom presentation.[15] Field agents also conduct workshops on county and statewide inservice days. Field agents have found that conducting a workshop is an excellent way to establish initial contact with schools and individual teachers, for workshops often result in numerous followup visits to the classrooms of the attending teachers.

Individual Assistance Frequently field agents provide highly individual service to teachers. They often help a teacher find appropriate materials in the Resource Center for a specific idea that the teacher may have. Field agent James Gussett lists in a Del Mod monograph several typical individual teacher requests that he has responded to:

> "Would you help me set up a unit dealing with how plants are helpful to man?"
>
> "What are some activities involving temperature that cut across several content areas that I might use with my upper elementary children?"
>
> "I've got five broken aquariums. How can I get them fixed without my paying for it."
>
> "I want to demonstrate the inhalation of helium. Where can I get some?"[16]

Individual assistance can also take the form of simple confidence building.[17] This involves getting the teachers to believe in what they are doing, giving them courage and confidence to try new techniques that field agents have demonstrated to them.

Planning for the Future During the last year of Del Mod's five year existence, i.e. during the fiscal year 1975-76, the field agents intend to continue strengthening the content and methods background of mathematics and science teachers. There will most likely be a somewhat greater emphasis on the introduction of new curriculum materials. There are plans to provide cooperative curriculum workshops for preservice as well as inservice teachers. Such workshops would be conducted jointly by the field agents and the University of Delaware's College of Education.[18] The Del Mod field agent component is also preparing for self-sufficiency by July 1976 when Del Mod ceases its federally funded existence. The field agents anticipate being able to generate supplemental income for the continued support of the field agent programs by developing and marketing specialized, unit priced service packages to interested schools and districts.[19] To that effect, the agents, under the guidance

of their new component coordinator, are conducting an extensive time and cost analysis of the services they provide.

There are also tentative plans to cooperate with the state science supervisor and other math and science leaders in arranging an event for the state's secondary students in order to observe the country's bicentennial through science and math.[20]

Summary There are presently six Del Mod field agents, four in the field of science, two in mathematics. One agent is housed at the Georgetown campus of Delaware Technical and Community College, one has his office at the Delaware State College, two are located at the University of Delaware, and two are housed in the central offices of two different Wilmington area school districts.

The Del Mod field agents work mainly at the primary and middle school levels, although four of the agents also have worked with kindergarten teachers and at least one has worked with grades 9-12.

Basically, the field agents are engaged in two types of assistance. They engage in confidence building with teachers not sufficiently trained or confident in their content area. With more confident teachers, the field agents focus on teaching methods and curriculum planning.

Some school administrators have viewed the Del Mod field agents' role as considerably overlapping with that of a science supervisor. However, the field agents have the tremendous advantage of not having any administrative duties to perform that would take precious time away from their service role. Their lack of administrative authority makes them totally nonthreatening in the eyes of the teachers and makes it much easier for the field agent to gain the confidence of the teacher.[21]

FOOTNOTES FOR CHAPTER I

[1] Charlotte H. Purnell, Del Mod System: Annual Report 1972 (Dover, DE, September 30, 1972), p.12.

[2] Charlotte H. Purnell, The Delaware Model: A Systems Approach (Dover, DE: Del Mod System, 1972), p.5. See also Robert L. Uffelman, Getting Involved In Del Mod Activities (Newark, DE: University of Delaware, 1972), p.5.

[3] Charlotte H. Purnell, The Delaware Model: A Systems Approach, p.7; John F. Reiher, "Summary of a Study of the Field Agent Approach to Methods of Retraining Junior High or Middle School Science Teachers," Del Mod Project #70-1 (Typewritten report, Dover, DE, 1971), p.2; Eleanor F. Sloan, Science-Math Resource Center: What Makes It Go (Dover, DE: Office of the Del Mod Component Coordinator for the State Department of Public Instruction, 1974), p.5.

[4] The Augmented Council of Presidents, State of Delaware, "Appendix V," A Proposal for the Del Mod System (The Delaware Model: A Systems Approach to Science Education), Proposal to the National Science Foundation, February 24, 1971, p.267.

[5] Ibid., pp.271-272.

[6] Ibid., p.271.

[7] Ibid.

[8] Ibid., p.51

[9] Ibid., p.61f

[10] Barbara A. Logan, Inservice Education and the Del Mod Field Agent (Dover, DE: Office of the Del Mod Component Coordinator for the State Department of Public Instruction, 1974), p.5.

[11] James H. Gussett, Field Agent Activities: Level 1 (Dover, DE: Office of the Del Mod Component Coordinator for the State Department of Public Instruction, 1974), p.4.

[12] James H. Gussett and Barbara A. Logan, Field Agent Activities in the Del Mod System (Dover, DE: Del Mod System, 1972), p. 6ff., and Gussett, Field Agent Activities: Level 1, p.4.

[13] Sloan, p.5.

[14] The Augmented Council of Presidents, State of Delaware, p.65.

[15] Barbara A. Logan, Inservice Education..., p.6.

[16] James H. Gussett, Educational Ombudsman - Science Area (Dover,DE: Office of the Del Mod Component Coordinator for the State Department of Public Instruction, 1973), p.5.

[17] cf. Richard E. Cowan, Confidence Building: The Role of a Del Mod Field Agent (Dover, DE: Office of the Del Mod Component Coordinator for the State Department of Public Instruction 1974).

[18] The Augmented Council of Presidents, State of Delaware, A Proposal for Renewal of Grant No. GW 6703, The Del Mod System (The Delaware Model: A Systems Approach to Science Education), Renewal Proposal to the National Science Foundation, January 1, 1975, p.11

[19] Ibid, p.11f.

[20] Ibid, p.23

[21] Teacher responses to a Del Mo questionnaire reveal conclusively that Delaware teachers in no way feel threatened by Del Mod field agent activities. See Uldis R. Golts, "Teacher Reactions Toward Del Mod Field Agents," (Typed Del Mod Document, Dover, DE: Del Mod System, May 1975)

CHAPTER II

THE FIELD AGENTS' MODE OF OPERATION

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Del Mod field agents provide direct assistance to Delaware's science and math teachers in such varied realms as teaching strategies, the use of materials, curriculum planning, and interpersonal relationships.[1] Their noncoercive approach and thorough subject knowledge have made them effective and highly popular change agents with Delaware's teachers. The purpose of this paper shall be to investigate the field agents' mode of operation in establishing, maintaining, and expanding teacher contacts.

Del Mod field agents base their assistance to teachers on previously established needs and objectives. Often the field agents contact the chief school officer in the district to determine where help is currently needed.[2] The close cooperation of Delaware's state supervisors of science and math facilitates needs assessment and the field agents' initial entry into schools.[3] The field agents are careful not to push their services onto a school or a teacher and instead prefer to wait for a formal invitation to assist.[4] In order to obtain such an invitation, the Del Mod System keeps the principals and teachers informed about the services a field agent can provide. A universally accepted procedure among field agents, no matter what type of organization they are a part of, is, that all other things being equal, "the contemplated program should be started among those groups who are more tolerant of receiving strangers and accepting new techniques."[5] In accordance with that maxim, Del Mod field agents try to identify schools that seem "ready to move" and offer their services there.[6] Such a procedure is especially warranted since all field agents actually have an "overflow" of teachers who want assistance. One field agent states succinctly: "I've decided not to spend time knocking down doors; there are enough people who want help."[7]

The teachers who actively seek assistance from Del Mod may, however, not be the ones in the greatest need of help. To counteract such one-sidedness, the agents have devised and are using

methods to contact new teachers who, simply because they have no felt need, remain uninvolved. Del Mod field agents often reach such teachers by identifying opinion leaders in each school and enlisting their support by helping them first. Once these leaders have been helped by a Del Mod field agent, others hear about it by word of mouth and may feel encouraged to request assistance or advice. Good intermediaries for contacting new teachers include building principals, curriculum supervisors, and other persons responsible for science and math programs.[8] Building principals decide whether a field agent is to work with all the teachers, only with those whom the principal recommends, or with any teachers who want to be involved. When the field agents are allowed to work with anyone interested, most of them make a habit of also stopping by the classrooms of the uninvolved teachers--"just" to chat or to leave some informational materials. Such casual encounters often evolve into a full-fledged assistance project.[9] One math field agent tries to capture the interest of uninvolved teachers by utilizing the math lab period (a study hall period) to teach their students mathematical concepts by means of games. The students enjoy these activities tremendously, and the field agent hopes that they might influence their teacher to conduct similar activities in the classroom. The same field agent also tries to distribute his available service time more equitably among "his" school districts by telling each district what weekly time period he can give them.

Since all Del Mod field agents receive more requests for services than they can handle, they are faced with the dilemma of deciding whom to assist and whom to put on a waiting list. The agents have found that in order to maintain a reasonable level of effectiveness, they can not have a case load that exceeds one hundred teachers each. One field agent has, nevertheless, tried to handle all requests for services, even if he happens to have an overload of cases. This extremely dedicated agent often works with teachers after school hours, sometimes till 10 o'clock at night. When even he has to become selective, he tries to establish whom he can help the most. All other field agents have more reasonable limits to their dedication. They have resolved the overflow problem simply by selecting their clients on a "first come, first served" basis, and by only occasionally giving priority to "emergencies." One agent states that the field agent component coordinator would prefer to screen the field agents' overflow clients himself, but that the agents feel that there really is no time to look into the merits of each case, and that if there would be time to be selective, the agents themselves would be more capable of making the correct choice for "their own people."

The field agents have learned to regard various group projects, such as seminars or workshops, as an effective way to contact individual teachers. Del Mod's workshops and seminars are instituted as a response to established needs of the teachers; but they also serve, by bringing together teachers with various problems from various schools and districts, as instruments for discovering or defining additional needs. The resulting needs assessment may then give rise to additional group or individual assistance projects. Thus, there is a continual process of assessing and satisfying needs, one leading directly to the other. Del Mod's very first project was a group project titled A Study of Field Agent Approach (Project 70-1). This project, which helped to establish parameters for all subsequent group projects, was conducted by John Reiher during the academic year 1970-1971. The project actually preceded Del Mod's official start by one year and was financed by "mini-grants" from the National Science Foundation and the DuPont Company. One significant objective of the pilot project was to develop a prototype for Del Mod's field agent concept. Practically all of Kent and Sussex County science teachers participated. The sixty-five participants were divided into six groups and met one full day every other week for fifteen weeks. Their program consisted of mini-lessons on some of the newer science curricula, the use of micro-teaching, lectures, workshops, field trips, and the production of teaching units. Del Mod paid the school districts for the participants' substitute teachers, and also conducted a training workshop for the substitutes. The state science supervisor assumed the responsibility for all arrangements with the schools and assisted field agent John Reiher in developing the details of the program. From this initial venture several general conclusions emerged about the conduct of Del Mod group projects:

a. Teachers and districts will cooperate if teachers are given release time and if the districts are provided with remuneration for substitutes.
b. Effective group sessions must be small.
c. Extensive use should be made of micro-teaching techniques and interaction analysis.
d. Materials should be easily transported, inexpensive, and adaptable to most classroom situations.
e. Field agents should vary their pattern of presentation in order to avoid fatiguing their audience.

f. Follow-up is strongly recommended as a way of reinforcing and insuring implementation of the skills presented in the group sessions.[10]

Field agents are still finding these guidelines useful in conducting Del Mod group projects. Additional insights emerged as the field agents gained practical experience in conducting various types of group projects. One field agent has concluded that seminars, to be effective, should consist of at least a dozen sessions, with the sessions spread throughout the year. This procedure provides ample time for the teachers to assimilate information. The field agent recommends this procedure especially when dealing with older teachers. Several field agents suggest some screening procedure for group project participants. One field agent states that a Del Mod workshop to coordinate science and mathematics lost much of its effectiveness due to the fact that participation was not restricted to just science and math teachers, but also included teachers of reading, history, and other nonscience subjects. Many of the participants had little interest in the topic covered and consequently gained little from the workshop and made no contributions to it. Another field agent has a negative view of principals participating in workshops. He claims that principals automatically assume a leadership role and often display a flippant attitude. In this field agent's words, "the situation can become deadly, extremely deadly." Since the participants of workshops rarely can be properly screened, one of the field agents simply advises not to worry about teachers not paying attention during workshops. It is simply a factor that one has to contend with.

The backgrounds, competency levels, and attitudes of group project participants in regard to science teaching often leave much to be desired.[11] The field agents' initial task must therefore be to bolster the teachers' confidence level by establishing good rapport and getting them involved in techniques and activities that bring instant success.[12] The workshop is planned in such a way that everyone learns something that he immediately can carry out successfully in his own classroom. Field agents conduct workshops in an informal atmosphere, emphasizing the process of learning together and avoiding the unidirectional flow of information that characterizes the classic teacher-pupil relationship.

When teachers feel competent to handle different teaching techniques, they begin to realize the necessity for curriculum coordination with other teachers, grades, and schools.[13]

During the first few years of Del Mod's existence, field agents did not put much time into curriculum planning, but now they have a considerable demand for assistance in this activity. Also in this type of group project, the field agents consciously cultivate a low profile and try to stay out of the spotlight. "I usually have a teacher elected chairman, make sure there is necessary clerical assistance, and then set up an agenda," states one field agent. Delaware teachers appreciate Del Mod's low-keyed assistance. One science teacher states: "The field agents have not been a life raft. They have not stepped in and taken over. Agents like Barbara (Logan) have stimulated the teacher to problem-solve.... Any other way, and the teachers would have been too dependent on the field agent. This would have been bad. Instead, a corps of teachers has developed that is not afraid to tackle problems, is not afraid to look for solutions, and can create."[14]

In addition to providing teachers with new tools and techniques and making field agents aware of existing problems or needs in the participants' districts, group projects also make it possible for the teachers to evaluate the field agent's personality and abilities. As a rule, teachers are so positively impressed by the agents' capabilities, that they readily agree to individualized follow-up, and, stimulated by their own good experiences, recommend the field agent's services to their colleagues. One field agent recalls:

> "I had a rather spectacular success in my work at --------- school district. It used to be one of the worst districts to work in. Maybe I was successful because eleven teachers there were in a Del Mod course taught by me. One of these was a semi-supervisor. These people must have spread the word that I knew what I was talking about."

Without such previously established "inside contacts", the process to gain the trust of teachers and administrators can be long and tedious. Shortly after he was hired, one Del Mod field agent was assigned to work with people who had previously worked with another agent. This created a problem. The involved teachers and principals did not understand why this new agent was so interested in them. The relationship had not been developed naturally. "I did not spend enough time to break down all the barriers", states the agent, "but breaking down the barriers must be balanced against whether it is worth the time

required." There is a strong feeling among field agents that rapport is essential before any new ideas or techniques can successfully be introduced and accepted.[15] Teachers do not seek field agents as mentors, but as co-workers and friends.[16]

In schools where administrators and teachers resist change and innovation, rapport can be established only with a great deal of persistence on the field agent's part. It takes constant contact, long hours, time for the field agent idea to mature in the teachers' minds, and opportunities for the teachers to convince themselves of the field agent's sincerity and capability.[17] These factors have influenced Del Mod in its decision to eliminate parttime field agents. In a particular instance, a parttime agent was hired to work one day per week with middle-school teachers in an inner-city district. Teachers as well as principals strongly suggested that this practice be discontinued in favor of a person who intimately knew the problems of the district and would be available for call at any time.[18]

After the field agent has received permission to visit and work with volunteer teachers, his next step is to actually meet them. James Gussett, one of Del Mod's original field agents, suggests that the first meeting should be just a brief visit of introduction. This implies to the teacher that the field agent will not waste time with semantic pedantry.[19] The brief introductory meeting also gives the involved teachers a chance to realize that the agent is not as awe-inspiring as his title might suggest. This realization is facilitated by Mr. Gussett's studied effort always to dress and behave just a fraction less formally than the teachers he assists. To further the level of communication within a school or district, Mr. Gussett holds regular group meetings, where all of his individual assistance clients get together. The meeting times, scope, and possible group projects are designed according to statements of need collected from each participant.[20]

If a teacher has had no previous contact with Del Mod field agents, the agent concentrates on just being a source of encouragement to the teacher. He helps solve specific teacher problems in the classroom, provides information about resource materials and special programs, and is constantly interested, concerned, and available for consultation. The field agent is never more than a phone call away. He assuages teachers and administrators further by making it clear that he will not place any additional demands on the teachers, will refuse to be an evaluator of the teacher's performance, and will in no way pose a job threat.[21]

Field agents have found that teachers tend to become discouraged if they have to spend too much time on learning a new technique.[22] Therefore, when dealing with newly contacted teachers, Del Mod field agents emphasize so called "instant success" techniques. The teacher is taught a specific technique that is easy to master and that will capture the interest of their students. This "instant success" generates enthusiasm even in teachers who claim a "fear" of science and a lack of familiarity with the process of science. Field agents have also found that it is much easier to gain the confidence of teachers who are allowed and encouraged to have a say as to how they will be working with the agent and with their students. A field agent can get a teacher engaged in lab-oriented science activities almost immediately if he respects and utilizes the already existing expertise of that teacher.[23] During the on-going assistance project, the involved teacher, the building principal, and the curriculum supervisor are constantly kept informed of the field agent's activities and of the mode he works.

In rendering individual assistance, Del Mod field agents do not advocate any single criterion of good teaching, but instead introduce various modes of approach and encourage teachers to use methods with which they feel the most comfortable. However, if the teacher happens to favor the traditional lecture method, the agent will try to ease him, by means of casual suggestions and positive reinforcement, into an activity-oriented approach.

Field agents disagree somewhat among themselves to what extent they should get involved in the ongoing activities of a classroom. They all agree in principle, and state so to their clients, that it is not part of the field agent's duty or intent to perform for individual teachers or schools the actual operations of teaching, supervising, paper work or any other activity that is part of the normal operation of a school. Field agent James Gussett has steadfastly refused to do the teachers' work for them, and, instead, has assisted them in trying new techniques on their own.[24] James Gussett claims that as soon as an agent plans or conducts a lesson with a teacher's class, he loses his facilitator label and is immediately classified as being of the same ilk as a supervisor or an evaluator. Gussett sees this also as an infringement on the autonomy of the district, on the confidence of the teacher , and on the credibility of the field agent. Gussett is very adamant about the field agent position not being used to provide teachers with free time.[25] All other field agents perform varying amounts of demonstration teaching. Dick Cowan, just like Gussett, focuses his assistance on the teacher rather than on a group of students.

"When you help a teacher, you help a whole class of children," he states. Nevertheless, he occasionally teaches his client's class, so as to show in practice the manipulatives his client is interested in. According to Cowan, such a demonstration class also gives the teacher a chance to evaluate the field agent's skills as teacher. Quite contrary to field agent James Gussett, Cowan is convinced that demonstration classes bring the field agent down to the teacher's level, and away from the "ivory tower" image that, in the teacher's mind, includes such characters as supervisors, college professors, and principals.[26] It should be noted that when Richard Cowan engages in demonstration teaching, he visits the classroom for several days in a row, giving the students and the teacher a chance to get used to his presence. While conducting the demonstration class, Cowan invariably tries to get the teacher to assist him. Demonstration lessons are very popular with teachers, perhaps because the teachers feel they can learn a lot from seeing a technique applied "correctly", perhaps simply because they find it easier to watch than to do. Whatever the case may be, many teachers feel a need for an even greater amount of demonstration lessons.[27]

Yet another Del Mod field agent states that he regularly gets involved in classroom activities. He never teaches an entire class, but occasionally does teach a small group of pupils, hoping that the teacher is watching and learning. The agent states that he never sits as a silent observer, and instead assists the teacher in the teacher's own classroom activities.

One field agent has a strongly student-oriented approach. "The classroom belongs to the students", he states. "If the kids have no fun, the teacher has no fun. Nothing is worse than doing something that's not fun. Therefore, student motivation may mean teacher motivation." Consequently, he tries to develop an immediate relationship with the students of his clients. A part of his technique is to request student help for practically everything he does. He makes a point of requesting girls as volunteers, thereby hoping to counteract the social stigma that still attaches to girls studying science. Since his specialty is environmental science, his requests for volunteers may involve such activities as shopping for fish for the school aquarium, measuring and planning a school nature center, or simply carrying equipment from one room to another. During these activities, he leaves all reasonable decision-making to the students, limiting his own role to providing his student-assistants with a basis for their decisions.

In dealing with teachers, Del Mod field agents often have to make a conscious effort to downplay their role and capabilities

so as to counteract the panacea aura that so frequently accompanies them.[28] The field agent must not be so conceited that he can't admit when he is wrong, nor so insecure that he is afraid of learning along with the teachers and the students. The sooner a field agent makes it clear to the teachers that he does not have all the solutions, the more effective will his assistance become. The agents also have to counteract a tendency on the part of many teachers to rely too much on the field agent regularly bringing in sophisticated equipment and materials from Del Mod Resource Centers. The field agents try to make it clear to these teachers that their school's science program can be viable without being entirely dependent on shiny materials.[29]

A certain amount of the field agents' time in the classroom has been devoted to systematic recording and analysis of classroom practice. These analyses have been conducted to provide teachers with a means for self-evaluation and have served as pre- and post-tests for Del Mod's internal evaluation. Such techniques have been used as interaction analysis, microteaching techniques, and videotaping.[30] Field agents found that videotaping in itself, as a means of self-evaluation, frequently presents too much of a threat to teachers to be a suitable instrument for the enactment of change. On the other hand, videotaping is accepted and can be extremely effective when it is an integral part of an ongoing assistance program, and the teacher is confident that the reviewer will not reveal the tape analysis to administrators and fellow teachers.[31]

The amount of time a field agent spends with a particular teacher depends mostly on certain predetermined objectives. These objectives may either be set up jointly, and sometimes quite formally, with the teacher, or may merely be formulated in the agent's own mind. One field agent states that his all-important considerations are how much help a teacher needs, and how much the teacher wants him there. Similarly, another agent says that he stays with a teacher either until the problem has been solved or an impasse has been reached. That agent visited one particular teacher over twenty-five times--but the final result was positive. One other Del Mod agent likes to provide a heavy dosage of assistance to new teacher contacts, but states that the amount of his assistance also depends on how much the teacher benefits. Most field agents admit that occasionally their own feelings toward a teacher have some bearing on the longevity of the individual assistance.

During the main part of the school year, (December through April), the field agents divide their time approximately evenly between their office, school visitations, and meetings. At the

beginning and final months of each school year (September and May), the agents spend about two-thirds of their time in the office, and during October and November two-thirds of the time is spent visiting schools.

Teachers, as well as the state science supervisor, have expressed a strong preference for Del Mod field agents to spend more total time with individual teachers. Such a desire coincides with the field agents' own wishes, but has to be curbed to allow some time slots for meetings, planning, material preparation, and a small amount of Del Mod-directed paperwork. The state science supervisor has further suggested that field agents could be eliminated in districts where official supervisors exist. Field agents counter this argument by pointing to the popularity of their non-threatening approach, and claiming that a supervisor might have difficulties engendering enough teacher confidence to succeed as a change agent. Teachers might fear the supervisor's evaluative clout too much to dare attempt a new technique in his presence.

A possible way for the field agents to expand their classroom contact might be to develop volunteer leaders among the teachers they assist. This would be in accordance with the classic extension work adage "Never do anything yourself that you can get someone to do for you."[32] Yet, the ideal is not always practical. Firstly, teachers would hesitate putting in the necessary time and effort to assist a colleague if this would entail using their own free time. Secondly, teachers might not readily accept assistance from a colleague in the same building--they would not want to admit that a colleague of theirs might be a "better"teacher than they. Thirdly, the "master teachers" would be school employees, directly accountable to the school administration. Their potential clients might fear that the principal might insist on knowing the shortcomings of each assisted teacher. On the other hand, an outsider such as the Del Mod field agent, is not employed by the administration and can be relied on resisting all undue pressures from it. For these reasons, whenever field agents have engaged in leadership development, it has been indirectly--simply by initially concentrating the assistance program on teachers who, for various reasons, already are regarded as opinion leaders by their colleagues.

Del Mod's field agents identify themselves more with teachers than with administrators. They strive to foster professional attitudes in the teachers and are concerned when administrative demands and regulations place restrictions on those attitudes. At the same time, the field agents appreciate the assistance and support that school administrators have given them. They fully

realize that without the consent of the principal, they could not set their foot inside a school building. Field agents have found it strategically important to establish a nodding acquaintance and good working relationships with all key people in the districts. A very helpful facilitator for the initial establishment of these relationships has been John Reiher, the State Science Supervisor, who also serves as Del Mod Component Coordinator for the State Department of Public Instruction.

A major part of the field agents' efforts to maintain good working relationships with school administrators consists of keeping the school office well informed on what the agent is doing and with whom he is working. The agent must make sure that principals, administrators, and teachers understand his purpose and philosophical approach. "Put yourself in a well-defined niche, so that others know what to make of you," states one field agent. Being personally acquainted with key personnel, field agents have been able to help establish and maintain lines of communication and cooperation between schools and districts.

Field agents are careful not to let their role as information carriers deteriorate into that of an evaluator and informer. Both of the original field agents state that administrators, in the initial stages of Del Mod, have frequently tried to get field agents to provide an evaluation of a teacher. Both agents have adamantly resisted such attempts and have clarified in no uncertain terms that field agents do not serve as evaluators. One of these agents, if pressed, always says that the teachers are all very good. He amplifies: "If I don't say anything, that's automatically construed as a negative opinion. For that reason, I always say something positive."

At the present time, administrators have become more familiar with the field agents' mode of operation, and the more recent Del Mod agents have experienced only rare instances of undue inquisitiveness on part of the school administrators. One of these agents explains: "I define my job before I help. After that, Principals just would not ask me (to evaluate a teacher)."

To maintain their non-threatening status with the administration as well as with teachers, the field agents studiously avoid taking sides in controversial issues. Their impartiality underwent the proverbial acid test during a recent teacher strike. All field agents found diplomatic ways of not crossing the picket lines and still never coming out directly for or against the strike. They changed their schedules, worked with school districts that

were not on strike, invented excuses, and postponed meetings. Through these tightrope tactics they achieved their aim of not alienating teachers from either side of the strike issue. Even in less trying circumstances field agents try to display an aloof attitude. They shy away from prejudging any situation. They are especially careful not to say negative things about school districts, and instead emphasize positive aspects as much as possible. Teachers as well as administrators know that the field agents can be trusted not to reveal confidential information. The roots to the field agents' effectiveness and popularity lie precisely in their concerned impartiality.

Another source of strength for the field agents are the three Del Mod Science and Math Resource Centers. The centers are repositories for science and math materials, kits, books, catalogs, pamphlets, idea files, audio-visual equipment, etc. These resource centers serve as a back-up mechanism for the field agents, making it possible for them to quickly gain first-hand knowledge of strong and weak points of the latest science tests and materials. The agents also use the centers for conducting such teacher improvement activities as workshops, conferences, curriculum planning, microteaching, and material assembly.[33]

Each of the three resource centers has its own characteristics. As viewed through the eyes of Del Mod's field agents, the Delaware Technical and Community College resource center has helpful and competent personnel, a relaxed atmosphere, and updated materials. The Delaware State College resource center has a good layout, but is unmanned during the lunch hour, and its librarian is not considered fully competent to discuss materials or equipment.[34] The resource center at the University of Delaware has good materials and audio-visual equipment, but the field agents would like to see more up-to-date materials. The personnel at this center consists mostly of student workers, who are not service-oriented and cannot be expected to be knowledgeable. The University resource center also lacks ample parking space in its vicinity. Only the Delaware Technical and Community College resource center has attempted to follow closely the objectives set forth in the original Del Mod proposal. The other two centers have had to accommodate also the objectives of their housing institution, for example emphasis on pre-service education and inclusion of materials pertaining to fields other than science and math. Consequently, the two housing-institution-oriented resource centers have not interacted with the field agents as closely as the original Del Mod concept had anticipated.[35] One of the field agents housed at the University of Delaware has even found it necessary to establish a "mini-resource center" in his office so as to assure

himself of immediate availability of essential materials. In contrast at the "Del Tech" resource center, the field agent's office, files, and materials are an integral part of the resource center itself. The center's highly knowledgeable librarian and the field agent work together as a team. Their close cooperation and common objectives add to the effectiveness of both the field agent and the resource center.

A part of the field agents' success can be attributed to their flexibility. Del Mod System has ensured this flexibility by constructing a purposefully non-specific job description for its field agents. This enables the field agents to give immediate, reactive service to requests for help and to improvise and adapt themselves to any situation they encounter.

Although the field agents may not be a panacea in science and math education, they are all eager to help, have ample technical knowledge and back-up mechanism to help, and place themselves in situations where their help is wanted. Furthermore, the field agents are not regulated in their actions by allegiance to any single educational institution or program, and thus can assume a totally nonthreatening and noncoercive attitude when dealing with teachers. Their popularity with Delaware's teachers attests to the correctness of their manner of operation.

FOOTNOTES FOR CHAPTER II

[1]See Chapter I for a discussion of the duties and activities of Del Mod field agents.

[2]Alan Nowakowski, "The Traveling Observer Report on Del Mod," Del Mod System in Science Education. A report to the National Science Foundation, Project No. G.W. 7903. (Kalamazoo, MI: Western Michigan University, College of Education, The Evaluation Center, June, 1974), p. 117.

[3]The Augmented Council of Presidents, State of Delaware, A Proposal for the Del Mod System (The Delaware Model: A Systems Approach to Science Education). (Dover, DE: Submitted to the National Science Foundation on February 24, 1971), p. 246.

[4]Egon G. Guba, "The Del Mod Project: An Educational Change Perspective," Del Mod System in Science Education, p. 246.

[5]Afif I. Tannous, "Extension Work Among the Arab Fellahin," Farmers of the World: The Development of Agricultural Extension, edited by Brunner, Sanders and Ensminger (New York: Columbia University Press, 1954), p. 88.

[6]Guba, p. 247.

[7]Interview with a Del Mod field agent, January 9, 1975.

[8]Guba, p. 247.

[9]Charlotte H. Purnell, "The Del Mod System Technical Evaluation: Internal Response." Del Mod Document submitted to the Augmented Council of Presidents (Dover, DE: Del Mod System, October, 1974), p. 47.

[10]See the description of Project 70-01 in Appendix I.

[11]James H. Gussett, Field Agent Activities: Level I. A Del Mod Monograph (Dover, DE: Office of the Del Mod Component Coordinator for the State Department of Public Instruction, 1974), p. 6f.

[12]Gussett, p. 8.

[13]Thomas M. Baker, editor, Del Mod at a Glance, Volume II: A Synopsis of the 1972-73 Annual Report for the Del Mod System (Dover, DE: The Office of the Del Mod Component Coordinator for the State Department of Public Instruction, June 30, 1973), p. 28.

[14]John L. Kinsler, "Del Mod Evaluation," A Typewritten Del Mod Document (January, 1976), p. 4.

[15]Charlotte H. Purnell, Del Mod System: Annual Report 1972 (Dover, DE: September 30, 1972), p. 19.

[16]Kinsler, p. 8.

[17]Charlotte H. Purnell, Applying the Del Mod Model. A Del Mod Monograph (Dover, DE: Del Mod System, 1972), p. 11.

[18]See description of Project 71-05 in Appendix I.

[19]Gussett, p. 5f.

[20]Gussett, p. 5f.

[21]Purnell, Annual Report 1972, p. 19.

[22]Kinsler, p. 5.

[23]Gussett, p. 6.

[24]John R. Bolig, ed. Del Mod at a Glance, Volume III: 1973-74 Annual Report for the Del Mod System (Dover, DE: The Office of the Del Mod Component Coordinator for the State Department of Public Instruction, October 30, 1974), p. 22.

[25]Gussett, p. 4.

[26]Richard E. Cowan, Confidence Building: The Role of a Del Mod Field Agent. A Del Mod Monograph (Dover, DE: Office of the Del Mod Component Coordinator for the State Department of Public Instruction, 1974), p. 5.

[27]Yvonne Welch, "Del Mod Evaluation." Typewritten Del Mod Document, February, 1976.

[28]Gussett, p. 5.

[29]Gussett, p. 5.

[30]See projects 72-21, 72-36, and 72-39 in Appendix I.

[31]Baker, p. 28.

[32]Tannous, p. 71.

[33]The Augmented Council of Presidents, p. 67.

[34]John R. Bolig and Barbara Westbrook, "Del Mod Field Agent/Resource Center Interaction Study." Typewritten Del Mod Document (Dover, DE: Del Mod System, January, 1975), pp. 3ff.

[35]Earle L. Lomon, "The Del Mod Project: A Science Perspective", Del Mod System in Science Education, p. 273f.

CHAPTER III

THE CONDUCT OF PROJECTS

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Practically all field agent contact with teachers is formalized and classified into Del Mod projects. Main considerations for starting a project, be it an individual assistance project or a group workshop, involve selecting the most appropriate type of project and attracting participants for that project. Since most project suggestions originate at the local level, projects usually have a readily identifiable target audience. Teachers participate most readily in projects where the field agent visits teachers in a district with solutions to problems in that particular district. A project fully backed by the district not only fills an expressed need and attracts participants, but its product is often significantly superior to results obtained in most other Del Mod funded projects.[1]

To a great extent, Del Mod System is made aware of problem areas by the districts on their own initiative. Most of Delaware's local districts annually review the priority order of their own needs and inform the State Department of Public Instruction and the Del Mod office of their conclusions. The field agents and Del Mod's institutional coordinators then take appropriate action to help alleviate these expressed needs.[2]

Some schools and school districts have not been able to formulate their priorities of needs. Common reasons for this inability are inertia, lack of exposure to new ideas, provincialism, personality conflicts among the academic staff, lack of administrator concern, and a fear of admitting failure.[3] In these situations, the field agents have to take the initiative in appraising the district's strong and weak points. Their appraisal is aided by facts about that particular district or school stored in Del Mod's data bank. Further information is gathered through informal chats with principals and teachers. A certain amount of information is conveyed to Del Mod by the State science and math supervisors. The supervisors travel around the State and naturally become aware of needs in the various districts.

If the school principal originates the initial contact with Del Mod, he usually already has a general idea as to the nature of necessary assistance. In the initial stages, the

principal may merely ask for advice about the ordering of materials. When the materials arrive, the field agent is often invited back to show the teachers how to use the materials. No matter whether the initial contact was established by the principal, a teacher, or by the field agent himself, the field agent makes sure to contact at least three interested parties: the principal, the curriculum supervisor, and the involved teachers. If all three sources agree as to what the field agent should do for the school or district, a mutually agreeable time schedule is set up for the agent's involvement in that project. If the principal wants the field agent to work with specific teachers, these teachers are contacted directly by the field agent. If the principal allows the field agent to assist any interested teachers, the agent may introduce himself and his skills to the teachers at a faculty meeting, or he may write an open letter to the faculty. Often he meets interested teachers through casual personal contacts. Frequently teachers become aware of a field agent's activities through the word of mouth of another teacher.

An effective way of establishing initial contact with teachers is a group project, such as a workshop or seminar. At the end of the workshop, the field agent tells the participants that he is available for individual assistance and follow-up. This has become a favorite way for field agents to establish personal contact with teachers. In these situations, field agents find it practical to keep their schedules open the next day for follow-up visits with those participants who are trying to apply knowledge gained in the workshop or seminar. One math field agent explains: "You have to plan to be at that school the day after the workshop, or the teachers will forget about you."

The procedures for initiating, administering, and evaluating a Del Mod project are summarized as "Appendix F" in the 1972 Del Mod Renewal Proposal.[4] A part of that summary is included as "Appendix II" in this paper. Generally, Del Mod funds are allocated only to projects whose preliminary budgets have been approved by the Augmented Council of Presidents and incorporated in the Del Mod Renewal Proposal for that particular year. Provisions are made, however, for immediate funding to unforeseen projects of exceptional merit. Such emergency funding is accomplished by obtaining permission from the funding agency to institute one or several line item changes. One such unbudgeted project was the highly successful full-day seminar for 415 teachers focusing on the comet Kohoutek. The prediction of its spectacular

arrival had spurred a sudden interest in astronomy and Del Mod's funding structure was flexible enough to allow for this seminar, even though it had not been allotted funding in Del Mod's Renewal Proposal for that particular year.

Del Mod System asks that proposed new Del Mod projects be supported by documentation which includes a preliminary budget, behavioral objectives, a target population which fits Del Mod's priorities, a summary and appropriate time table of proposal activities, some type of evaluation design, indication of money and time commitment from schools and other services and possible long range effects.[5] Continuing projects need only a brief budget explanation. Standardized forms for proposing projects were produced and were, at least in the early years, followed closely.

Each project director writes a final report on each project that has been completed and forwards it to his component coordinator, who eventually forwards it to the Del Mod Director. The final report includes the participants' names and schools, a brief description of actual activities and how each objective was satisfied, an evaluation of the results, the project director's comments, and any resulting materials.[6]

The field agents originally followed the requirements for pre- and post reports rather strictly. They found, however, that the projected activities and objectives often had to be changed when time came to actually conduct the project. This caused a certain laxity and vagueness on their part in constructing a project's proposal. A similar laxity and lack of uniformity has also become prevalent in the construction of the final report. Noteworthy by their frequent absence were efforts to evaluate projects. In fact, most projects have been evaluated merely from the subjective standpoint of the project director. For some projects no evaluative reports whatsoever have, in spite of fervent urgings by the Research Director, been prepared. Where the projects have been directed by field agents, this shortcoming is due to the agents' general aversion to paperwork, which they view as detracting valuable time from their direct contact with teachers. Field agents also have some evidence that asking project participants to spend time on evaluation efforts might cause resentment and decreased participation among the teachers.

In the planning of assistance projects, Del Mod has relied heavily on what teachers and school administrators say they need, as opposed to telling the schools what they should be doing based on massive outside analyses of needs.[7] Formal requests for field agent assistance fall into three general categories: requests from individual teachers, group requests, and district requests.[8] Individual requests focus on classroom assistance and on analysis of specific teaching strategies. Group requests usually call for seminars to strengthen the teachers' specific content knowledge and for workshops to inform teachers of available resources and strategies for utilizing these resources in their classroom. Field agents find that middle school and junior high school teachers generally have an adequate subject knowledge in mathematics of science but need assistance with methods that are suited for inquiry-centered activities.[9] Seminars and workshops are occasionally set up for teachers from a single school, but more commonly for groups of schools who have identified a similar need.[10]

The most advanced level of field agent assistance is curriculum planning. Teachers seem to realize the necessity for curriculum coordination with other teachers and schools only when they themselves feel adequate in handling different teaching techniques.[11]

Aside from the types of projects mentioned above, Del Mod field agents also participate in certain strictly local district projects. These projects result when teachers or administrators identify a need that is unique to a particular school district. In these district projects there is often very little teacher input at the proposal-writing stage.[12] In the original Del Mod proposal there were no provisions for projects initiated by school districts. Technically, all projects had to be initiated by field agents. Yet, the demand for specific projects had been so great from the individual school districts that there were not enough field agents to direct each of the proposed projects. Del Mod assisted with these local projects as far as its limited manpower permitted, and starting with academic year 1972-73, Del Mod began partial funding even of projects that were conducted entirely by district personnel. Still, all projects continued to be coordinated through the office of the Del Mod Director and the Department of Public Instruction.

Local needs specified by individual school districts sometimes came into priority conflict with State needs. Some principals insisted on having the local district projects done first. In such cases, field agents assisted with the local projects first, then tackled more long-ranging goals, such as a common curriculum.[13]

As Del Mod progressed, the thrust of its field agent projects shifted from teaching strategies to curriculum planning and

coordination. A scrutiny of Table 1 reveals that by fiscal year 1974-75, more than half of the field agent projects focused on curriculum, and that out of 36 projects only five still put primary emphasis on teaching strategies.[14]

Overview of All Del Mod Projects in Which Field Agents Have Been Involved

TABLE 1

FISCAL YEAR	COMPONENTS INVOLVED				PRIMARY EMPHASIS					SUBJECTS			DURATION OF PROJECT				GRADE LEVEL OF TEACHERS INVOLVED			
	FIELD AGENTS	UNIV. OF DEL.	DEPT. OF PUBLIC INSTR	LOCAL DISTRICTS	RESEARCH PROJECT	TEACHING STRATEGIES	CURRICULUM	SUBJECT KNOWLEDGE	MATERIALS	SCIENCE	MATH	METRICS	ONE YEAR	ONE SEMESTER	LESS THAN ONE SEMESTER: MORE THAN ONE SESSION	LESS THAN ONE SEMESTER: ONE SESSION	K-4	5-6	7-12	UNSPECIFIED
1970 - 1971	1	0	0	0	0	1	0	0	0	1	0	0	1	0	0	0	0	1	1	0
1971 - 1972	3	0	0	0	0	3	0	0	0	3	0	0	0	3	0	0	1	3	2	0
1972 - 1973	9	1	0	0	2	4	2	0	1	9	0	0	4	5	0	0	4	7	5	0
1973 - 1974	19	1	0	12	0	6	13	0	0	17	4	0	17	0	0	2	10	10	9	5
1974 - 1975	36	4	6	23	0	5	21	5	5	21	9	8	7	5	6	18	21	25	15	2
1975 - 1976	19	0	0	16	1	6	7	2	2	7	11	0	3	5	7	3	3	5	1	10

In 1974-75 there also was a spectacular rise in the total number of projects. This increase was made possible by the fact that the duration of the average project was drastically reduced--half of the projects had a duration of one single session.

In fiscal year 1973-74 Del Mod hired two mathematics field agents and, in addition to its already established science program, began conducting mathematics projects. Already in that year, math projects achieved their proportional share of all the field-agent-conducted projects. Another innovation came in the fiscal year 1974-75, when field agents conducted numerous short-term projects dealing with the metric system.

In fiscal year 1973-74, Del Mod began preparing for its eventual phase-out by exerting a conscious effort to encourage official local district participation in field agent projects. As Table 1 illustrates, local districts became involved in approximately two out of every three field agent projects. The following year, nearly eight of every nine field agent projects were co-sponsored by local districts. It is hoped that

districts will continue conducting similar projects even after the discontinuation of Del Mod.

As the field agents responded to the increasing demand for assistance with curriculum planning, they themselves came to be looked upon as local district leaders. This recognition has come about in spite of the field agents' lack of official authority, and indicates the high regard teachers have for the agents' knowledge and competency.

FOOTNOTES FOR CHAPTER III

[1]The Augmented Council of Presidents, State of Delaware, A Proposal for Renewal of Grant No. GW 6703, The Del Mod System (The Delaware Model: A Systems Approach to Science Education), Renewal Proposal to the National Science Foundation (March, 1973), p. 50f.

[2]Charlotte H. Purnell, Applying the Del Mod Model. Del Mod Monograph (Dover, DE: Del Mod System, 1972), p. 7.

[3]ibid, p. 8.

[4]The Augmented Council of Presidents, State of Delaware, "Del Mod System: Fiscal Procedures, Reporting Manual, and Procedures for Submission of Proposals," A Proposal for Renewal of Grant No. GW 6703, The Del Mod System (The Delaware Model: A Systems Approach to Science Education). Proposal to the National Science Foundation (Newark, DE: The University of Delaware, March, 1972), Appendix F, pp. A-41 to A-49.

[5]ibid, p. A-47.

[6]ibid, p. A-49.

[7]Charlotte H. Purnell, Applying the Del Mod Model. Del Mod Monograph (Dover, DE: Del Mod System, 1972), p. 7, and Egon G. Guba, "The Del Mod Project: An Educational Change Perspective," Del Mod System in Science Education. A Report to the National Science Foundation, Project No. GW 7903. (Kalamazoo, MI: Western Michigan University, The Evaluation Center, June, 1974), p. 225.

[8]Barbara A. Logan, Inservice Education and the Del Mod Field Agent. Del Mod Monograph. (Dover, DE: Office of the Del Mod Component Coordinator for the State Department of Public Instruction, 1974), p. 6.

[9]The Augmented Council of Presidents, State of Delaware, A Proposal for Renewal of Grant No. GW 6703, The Del Mod System (The Delaware Model: A Systems Approach to Science Education). Revised version of the proposal submitted to the National Science Foundation in February, 1974 (May 1, 1974), p. 10.

[10]Robert L. Uffelman, Getting Involved in Del Mod Activities. Unpaginated Del Mod Monograph. (Newark, DE: University of Delaware, 1972).

[11]The Augmented Council of Presidents, A Proposal for Renewal of Grant No. GW 6703, The Del Mod System (The Delaware Model: A Systems Approach to Science Education). (1974), p. 10.

[12]Alan Nowakowski, "The Traveling Observer Report on Del Mod," Del Mod System in Science Education, Report to the National Science Foundation, Project No. GW 7903 (Western Michigan University. The Evaluation Center, June, 1974), p. 118.

[13]Charlotte R. Purnell, Del Mod Director, interview held at Dover, DE on January 21, 1975.

[14]See Appendix I for a summary of all Del Mod projects in which field agents have been directly involved.

CHAPTER IV

THE HIRING AND TRAINING OF DEL MOD FIELD AGENTS

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From the very conception of the idea, key people in Del Mod saw the field agent as an advisory specialist, operating in a manner essentially similar to that of a county agricultural extension agent. The Del Mod field agents also bear some resemblance to science or math supervisors, but have no administrative duties or powers.

The idea was so novel that Del Mod had no direct models to emulate for the recruiting, hiring, and training of its field agents. So much was, however, clear to the Del Mod leadership that the potential candidates had to be practical persons who themselves had taught long enough to know what approaches and techniques were likely to succeed with students as well as with teachers. Their main task as advisory specialist to teachers made it essential that the field agents be familiar not only with teaching strategies, books, materials, and curricula, but also with current developments and findings in their subject area.

Beside these specific job skills, candidates for the Del Mod field agent position had to possess certain talents and character traits that would aid them in their task. Del Mod's director, Charlotte Purnell, was looking for candidates who were articulate speakers and superb teachers. Their outstanding traits had to be imagination, independence, persistence, responsibility, sensitivity, and an ability to get along with people.[1] Various studies by competent authorities have pointed out that successful field agents, no matter what type of organization they may belong to, tend to have certain characteristics in common. Ms. Purnell's perception of the effective Del Mod field agent is in close agreement with these common characteristics. One authority defines the common characteristics as vision, ability to plan, initiative, resourcefulness, perseverance, tact, and power of expression.[2]

In addition to these general insights, the Del Mod director had, already in her former capacity as State Science Supervisor, gained practical insight in field agent work by supervising an experimental field agent program. This pilot program had been financed by a Federal mini-grant and was conducted during the academic year 1970-71, i.e., the year immediately preceding Del Mod's official start. John Reiher was hired as a full-time field agent for the pilot program. Reiher was studying for his Master's Degree in science education and had been a science supervisor for Roman Catholic schools in Delaware. Previously, he had taught middle school science. In his

field agent capacity, Reiher conducted training sessions for practically all of Kent and Sussex County junior high school science teachers.

Del Mod began the search for its first field agents by issuing a job description that listed the following personal characteristics and academic requirements of desirable candidates:

1. Bachelor's Degree in science or science education.
2. Master's Degree in science or science education.
3. At least five years of successful classroom teaching experience.
4. Ability to relate to adults as determined by recommendations of immediate supervisor, peers, or college/university advisor.
5. Leadership qualities as determined by preparation, personal interview and recommendation of individual(s) competent to determine.
6. Recent training in modern curriculum techniques and strategies.[3]

Del Mod did not wish to restrict the field agent search to local people. The openings were advertised nation-wide in professional journals and at national conventions. The Job Description was mailed to likely institutions and agencies, and a brief notice describing the field agent openings was sent to schools for posting on their bulletin boards. The notice specified that "all applicants should have demonstrated their ability to work with adults through such activities as department chairmen, conducting workshops, curricular committees, inservice education leaders or other like experiences." The Del Mod Director recalls that in hiring the field agents she made sure that they fit the Job Description.[5] She was looking for individuals who, according to personal recommendations, had demonstrated leadership qualities and already had held a position of leadership. The Director wanted responsible self-starters with an ability to get along with people.

As a result of the search, two field agents, James Gussett and Barbara Logan, were hired for Del Mod's first year of operation. They had been selected by the Del Mod Director and were approved by the Executive Committee, whose members represented the various component institutions of Del Mod.

James Gussett had a M.Ed. Degree and had taught 8-12 grade science. He also had some curriculum planning and education evaluation experience. The Del Mod Director had known Mr. Gussett since 1967 and had, in 1969, helped him obtain a Du Pont fellowship for a year's study at the Lawrence Hall of Science in California. His district superintendent recommended him highly.

Barbara Logan had a M.Ed. Degree and had taught science to grades 7-12. She had also been a school principal, administrative assistant, and assistant science supervisor. All of her teaching and administrative experiences had been in Catholic schools. Ms. Logan was enrolled in a leadership program at the University of Maryland and heard about the field agent position directly from the Del Mod Director, who had been invited as a guest speaker by the leadership program organizers. Ms. Logan was a nun, but was very community oriented. At the University of Maryland, Ms. Logan also had met John Reiher, Del Mod's pilot project field agent and had assisted him with a teacher evaluation project.

When Mrs. Purnell was appointed as Del Mod's Director, John Reiher took over her vacated State Science Supervisor position. In that capacity, he provided the two new field agents with temporary office space in the Department of Public Instruction and used his administrative powers to introduce them to the various school districts and to establish their field agent program for the first year.

Mr. Gussett stayed with Del Mod until Fall 1975, while Ms. Logan still remains with Del Mod. These original field agents have contributed much toward a crystallization of the Del Mod field agent concept and have served as a prototype for subsequent Del Mod agents.

A survey among the six field agents that Del Mod employed during the 1974-75 school year reveals that they themselves have some definite ideas about the recruiting and selection process of field agents. They all were highly motivated and got a good deal of personal satisfaction from their field agent role. Very often they saw themselves as the ideal field agent. Their description of a desirable field agent candidate was somewhat tinted by the fact that they saw themselves as the ideal field agent and were, in essence, describing themselves. Most would look for an extroverted individual who could get along well with people. Only one field agent came to the defense of the introvert: "Look for a very mature and stable individual. He should be strong and low profiled. That is the way I see myself." Other desirable qualities mentioned by field agents included openness, sincerity, honesty, and creativity. One field agent emphasized the necessity of having a sense of humor, while another agent found it important that a prospective field agent be a good organizer and manager. The same field agent also advised against hiring "clockwatchers", for a good field agent should be willing to give some extra time when needed.

In discussing desirable academic and nonacademic experience, the field agents again tended to consider their own experience as ideal. A field agent with a terminal academic degree stated that the field agent candidate

should have a strong background in his subject area and also a great deal of experience with teachers. He should not be a professional academician but should, nevertheless, be beyond being "just a classroom teacher." He should have been involved in a supervisory or teacher-training activity or, in lieu of that, should have a postgraduate degree. This field agent went on to say that classroom teachers do make the best field agents - but if they are "just" classroom teachers, they may have too narrow a view. They begin to open up more when they get away from the classroom. One other field agent sees a similar need for a strong background in educational theory and supervision but also readily admits: "My most helpful experiences were the years spent as a classroom teacher." Two of the six interviewed agents stated that the prospective field agent should have had classroom experience with different grade levels. The same two field agents also specifically advised against placing an emphasis on academic criteria. One of these two agents warned that "such people are often not in touch with the real world. They would tend to tell someone how to do things rather than assisting in doing it." Similarly, the other field agent claimed that "field agents with Ph.D. degrees might scare teachers off. Even a M.S. is not necessary."

One agent recommended that prospective field agents be classroom teachers with a very broad academic education and a background in curriculum planning. He also advised to look for motivation rather than academic education, and suggested that the ideal field agent "should be community involved, preferably a Jaycee."

The field agents that Del Mod actually hired usually were fairly young, had five to ten years' teaching experience, had a master's degree and additional graduate hours, were successful teachers, had experience with curriculum projects, and were seen by the teachers as one of them.[6] A Del Mod questionnaire, administered to 171 science and math teachers in Delaware sought to establish the degree of importance Delaware teachers attributed to the above described field agent characteristics.[7] It was found that the responding teachers did not consider a relatively young age a very important requirement for a good field agent. A majority thought that it was totally unimportant or minimally important that the field agent be fairly young. The teachers did find it relatively important that the Del Mod field agents have at least five years' teaching experience. Half of the teachers found such an experience highly important. The teachers found it only moderately important that the field agents have a master's degree. About every third respondent thought it was unimportant for the agents to possess this degree. On the other hand,

the teachers considered it very important that the field agent be a recognized successful teacher. Two out of every three teachers thought that such recognition was very, or even extremely, important. The responding teachers expressed an even stronger preference for a field agent with experience in curriculum projects. They also indicated a more than moderate preference for field agents that were seen as "one of us". A clear majority (56%) considered this quality as extremely important. Only one out of every eight teachers thought this quality was of little or no importance.

Based on the above mentioned results, we can conclude that Delaware teachers appreciate the characteristics of the typical Del Mod field agent. The field agents hired by Del Mod also fit the classical field agent image. Egon Guba, nationally known educational evaluator who personally visited and observed the Del Mod project, states: "The characteristics of the Del Mod field agents fit well the characteristics of successful change agents in other areas, as identified through extensive research. Chief among these is the fact that the Del Mod agents are homophilous, to a significant extent, with the populations they wish to serve."[8]

Dr. Guba's comments and the reactions of the surveyed teachers constitute an endorsement of Del Mod Director Purnell's perception and personal judgements in selecting such potentially successful field agents. Naturally, many factors enter into consideration when selecting an effective field agent, and many of those considerations have already been mentioned in this paper. All these considerations basically can be reduced to this: locate already successful classroom teachers who have some knowledge of curriculum planning, then hire the one with the most dedication, self-discipline, and self-confidence.

The Del Mod Director and all the field agents are of the opinion that field agents cannot really be trained by means of an organized training program if they do not already possess qualities essential for a successful field agent.[9] Consequently, Del Mod never had any specific guidelines for the field agents to follow nor any well-defined process for preparing them for their role.[10] The first two Del Mod agents, Jim Gussett and Barbara Logan, already had received a certain amount of field agent training before their employment with Del Mod and many subsequent Del Mod field agents received a certain amount of informal on-the-job training from Ms. Logan and Mr. Gussett.[11] Initially, there were plans to consider transforming a Del Mod leadership-training project into a series of inservice programs for field agents or field agent trainees.[12] These plans did not materialize - partly because of the time element involved,

partly because of a certain amount of skepticism on the part of the pragmatic field agents and their leadership at the prospect of having their successful methods and techniques scrutinized from the theory-oriented viewpoint of the director of the University-based leadership training project. No other organized attempt at providing in-service training for Del Mod field agents was attempted. Nevertheless, three of the six field agents that worked for Del Mod during the 1974-75 academic year received a certain amount of train ..g by starting out as Du Pont Fellows (later renamed Del Mod Fellows).

Del Mod employed its first Fellows during the 1973-74 academic year. The intent of this program was to release a young promising teacher from his classroom duties for one year on the condition that when he returned to his home district, he would be utilized in a leadership capacity.[13] This program was an expansion of an earlier Del Mod project of hiring classroom teachers as part-time field agents. A financial commitment from the Du Pont Company enabled this extended service. The recipients of the Fellowship had all been recommended by their supervisors or principals, but had no formal field agent training. At the outset of their year, Fellows were assigned as apprentice field agents to an existing full-time agent. By observing and assisting the Fellows developed a concept of their work. After approximately one month, they were assigned to several school districts and worked from then on exactly in the same manner as regular field agents.[14] All three Fellows were rehired by Del Mod also for the coming year. In this way, Del Mod obtained a cadre of field agents that were not only familiar with local school districts, but also had received a relatively short but practical on-the-job training by experienced field agents.

The six field agents and Del Mod Fellows which were employed by Del Mod during the 1974-75 academic year all agreed that a Fellow claimed that there already existed enough contact between the agents. All other Fellows and all three regular field agents expressed a wish for more information exchange between the agents. As early as November, 1971, field agent James Gussett states in his monthly report that "It would be helpful if one week every two months could be spent in another field agent's territory, working with and in that field agent's situation. It would give one more insight into the total situation and allow more brainstorming. This would be input for the field agents rather than all output."[15]

Several field agents stated that they would prefer more intensive professional contacts between the agents. One agent suggested a three- or four-day retreat with a heavy orientation program. Another one stressed the desirability of a field agent's sharing his monthly report with

other agents. "Each of us has a different background, a different training, and different experiences," states one field agent. "The more I know, the more effective I can be."

All field agents (and I include also the Du Pont Fellows in this group) suggest a training period for all new field agents. Most suggest a practical on-the-job training. Such training can be provided by having the new agent assist an established field agent. If there are no old field agents, it is suggested that the trainee be assigned for a brief period to a field agent in a different geographical location. One field agent suggests alternative practical experiences:

> "Two or three weeks at a migrant camp might be a good training experience. Try anything to shake them out of their 8:30 to 3:30 educational rut. Give them wider experiences with people. Involve them in education-oriented, but not classroom experiences."[16]

Other field agents recommend that besides practical experiences, the new employee also should receive theoretical training in group relationships and change-agent skills. He should also be familiarized with Del Mod, with the peculiarities of the institution that houses him, and with the philosophy and characteristics of the districts, people and the area where he would be working. He should be made aware of available community and educational resources. Field agents have to be diplomats and must therefore observe the area's power structure. They should be personally introduced to key people in the district and develop talking relationships with them.

Some of the field agents suggested that the neophite agent also receive training in such practical matters as the conducting of a workshop, the use of materials, and even the proper way to dress so as not to intimidate the teacher.

Most field agents envisioned the training of a new agent through a combination of a short theoretical training period (perhaps a summer training session or workshop) and subsequent observation of an old field agent in action. One field agent cautioned, however, that teachers might be made weary by someone following their field agent around.

We note that the field agents did not suggest any training in how to keep accurate records of their activities and program. As I have stated in Chapter I, the field agents do not consider paperwork an important aspect of their work.[17] Such training has, however, been suggested by the previously mentioned director of the University

based, Del Mod-sponsored leadership project. This project director, who also was an early key personality in the formation of Del Mod states that the field agents were not taught the importance of keeping a detailed log because "perhaps we did not know what we wanted from them."[17] More emphasis on detailed documentation of the field agent's activities was also suggested by the professional evaluator, Egon Guba, as a result of his examination of Del Mod from an educational change perspective.[18] As has been mentioned before, the field agents' reluctance to engage in extensive documentation stems from a fervent desire to use all their available time to actively assist the teachers in their "territory." There are two ways to maintain the level of active assistance available to teachers and still carry out the high level of documentation needed for an experimental program such as Del Mod, and both ways require availability of additional funds. One alternative is to increase the total number of field agents, thus decreasing the "case load" for each agent. According to an expert evaluator, meaningful coverage can only be achieved if each district has its own field agent.[19] Another alternative, recommended in Del Mod's renewal proposal for academic year 1973-74, would be to hire a research oriented field agent. In addition to the usual field agent skills, he would have an ability to write, would be familiar with research procedures and parameters and would have training in statistical methods and computer programming. This research field agent would visit and describe ongoing field agent projects.[20] Funds for the proposed research agent were, however, not granted. Del Mod's field agents were hired for the entire funded period, i.e. to the end of June 1976. Del Mod leadership people have since reached the conclusion that it might be wiser to hire a field agent for no more than three years. It was felt that agents employed for a longer period would tend to "burn themselves out" and lose some of their spontaneous enthusiasm. The agents should be recruited from among young, promising teachers, and the agents should consider their Del Mod service as an intern period, after which they would return to leadership positions in their original districts.

FOOTNOTES FOR CHAPTER IV

[1]Charlotte Purnell, conversation in Dover, DE, on December 4, 1974.

[2]Lincoln David Kelsey, with the collaboration of Cannon Chiles Hearne, Cooperative Extension Work. 3rd edition. (Ithaca, N.Y.: Cornell University Press, 1963), p. 65.

[3]The Augmented Council of Presidents, State of Delaware. A Proposal for the Del Mod System (The Delaware Model: A Systems Approach to Science Education). (Submitted to the National Science Foundation on February 24, 1971), p. 61.

[4]Charlotte Purnell, interview in Dover on January 21, 1975.

[5]ibid.

[6]Egon G. Guba, "The Del Mod Project: An Educational Change Perspective," Del Mod System in Science Education. A Report to the National Science Foundation, Project No. GW7903. Western Michigan University, College of Education, The Evaluation Center, (June, 1974), p. 245.

[7]Uldis R. Golts, "Teacher Reactions Toward Del Mod Field Agents." Typed Del Mod Document (Dover, DE: Del Mod System, May 1975).

[8]Guba, ibid., p. 249.

[9]The same conclusion is reached by Daniel L. Stufflebeam, "An Educational Evaluation Perspective," Del Mod System in Science Education, p. 118.

[10] cf. Alan Nowakowski, "The Traveling Observer Report on Del Mod," Del Mod System in Science Education; p. 118.

[11]Charlotte H. Purnell, "The Del Mod System Technical Evaluation: Internal Response." Written for the Augmented Council of Presidents, Del Mod System (Dover: DE, October, 1974), p. 1 and pp. 45f.

[12]The existing leadership project was designed to prepare teachers to work as in-service instructors and master teachers. For a more detailed description, see projects 71-23, 72-14, 72-32, and 72-40 in Uldis R. Golts', "Summary of Del Mod's University and College Projects", typed in-house document (Del Mod System, Dover, DE, August 1975).

[13] The Augmented Council of Presidents, State of Delaware. A Proposal for Renewal of Grant No. GW 6703, the Del Mod System (The Delaware Model: A Systems Approach to Science Education), Renewal Proposal to the National Science Foundation, January 1, 1975, p. 13.

[14] Loc. cit., See also Purnell, "The Del Mod System...", p. 45f and the Augmented Council of Presidents, State of Delaware A Proposal for Renewal of Grant No. GW6703, The Del Mod System (The Delaware Model: A Systems Approach to Science Education), Revewal Proposal to the National Science Foundation (March, 1973), p. 186.

[15] James Gussett, "Field Agent Monthly Report, Nov. 1971", included as part of "Appendix J" in the Augmented Council of Presidents, State of Delaware, A Proposal for Renewal of Grant No. GW6703 The Del Mod System (The Delaware Model: A Systems Approach to Science Education), Renewal Proposal to the National Science Foundation, (March 1972), p. A-111

[16] Interview with a Del Mod field agent on January 9, 1975.

[17] Robert L. [illegible]man, interview held at Newark, DE, April, 1975.

[18] Leon G. Gubb, Ibid., p. 250.

[19] Earle L. Lomon, "The Del Mod Project: A Science Perspective "Del Mod System in Science Education. Western Michigan University College of Education, the Evaluation Center (June, 1974), p. 291.

[20] The Augmented Council of Presidents, State of Delaware, A Proposal for Renewal of Grant No. GW6703, The Del Mod System (The Delaware Model: A Systems Approach to Science Education), Renewal Proposal to the National Science Foundation, (March, 1973), p. 99.

CHAPTER V

THE ADMINISTRATION OF DEL MOD'S FIELD AGENTS

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Del Mod's administrative policy basically consists of hiring a highly competent and motivated individual for the job to be done and then letting him do it with as little administrative interference as possible. This policy is a necessity, for Del Mod's effectiveness rests on needs assessment, quick appropriate action, equally quick feedback, and assessment of success.[1] Such an action-oriented endeavor as Del Mod requires competent employees who are capable of working dynamically with the target population without the time-wasting impediment of constant supervision and a barrage of administrative restrictions.

Del Mod's administrative policy of non-interfering coordination applies also to its field agent component. Until July 1, 1974, the field agents were accountable directly to Del Mod's director Charlotte H. Purnell. No other person had a direct authority over them. The original Del Mod proposal made a special point of stating that the field agents would not serve as an arm of the academic institutions in which they were housed.[2]

Most field agents have a resource center as their home base, although only one field agent has actually had his office right in the center. Most have their offices in the same building as the resource center, but on a different floor. In spite of the fact that the field agents work from resource centers which are controlled by the institutions in which they are located, the field agents do not report to the coordinators of these institutions, but to Mrs. Purnell, the State Director of Del Mod.[3] Due to special situations, two field agents were housed in their local school district's administrative offices. One field agent had tenure in his district. He would have lost his tenure if his office were outside the district. This field agent was listed by the Directory of Delaware Schools, 1974-75 as "Field Agent, Environmental Science" for his school district. Practically all of his duties are within the district limits. The other agent was assigned science supervisory duties in an inner-city district, and was listed

in the Directory of Delaware Schools as the Science Supervisor for that district. His duties were limited strictly to that district. Both of these agents have a certain administrative allegiance also to their local districts.

The field agents meet with the Director for occasional formal meetings and numerous informal consultations for the purpose of planning, sharing ideas, and deciding the direction and scope of programs. On occasion, the field agents also meet formally with Del Mod's Component Coordinators, mainly to inform this group of recent and future field agent activities that involve the various components.

Even though the field agents have a great deal of autonomy in the way they assist Delaware's teachers, their general conduct of activities is expected to conform to some broad guidelines. Their specific tasks, as suggested in the original proposal and their job description, have already been discussed at length in chapter one of this report. Suffice it to say, that field agents are expected to make use of individual contact, group work, and group instruction for the purpose of creating in teachers an awareness and readiness for change and imparting knowledge and experience necessary for change.[4] Each field agent is assigned specific, but not rigid, grade levels and geographical areas to work in. It is also generally understood and adhered to, that Del Mod's activities are to be true assistance projects, and not just a series of validation projects for some particular educational theory. Field agents are to help to the full extent of their available time and energy anyone who asks for help. This philosophy precludes the establishment of control groups to whom assistance is denied due to considerations for statistic documentation of impact. What Del Mod's administration expects of the field agents are the same principles that govern relationships in any type of cooperative extension work:

> 1. Full understanding of the objectives and organization of programs, and unity of purpose of the administrative and field personnel at all levels. Serving the public welfare should be the aim.
>
> 2. Acceptance by each participant in a cooperative arrangement of the responsibility for making the joint program workable and effective.

3. Constant appraisal of the objectives and programs of the components to see that they are following the pattern for which they were created.

4. Maintenance by each participant of a sincere attitude and a willingness to develop plans for cooperative action with other organizations without relinquishing his own responsibilities.

5. Adequate interpretation and reporting of activities to cooperating and sponsoring groups and to the general public.

6. Mutual acquaintance of personnel to promote understanding.[5]

Visibility and publicity are extremely important qualities to the field agents in their endeavor to gain teacher acceptance.[6] To enhance both of these qualities, Del Mod's administration actively encourages the field agents to be available for professional consultation, to attend and give lectures at science and math conventions, to publish articles, and to speak to various professional and civic groups. A good part of Del Mod's national recognition derives from the publicity obtained through the field agents' participation as lecturers at numerous national and regional science teachers' conventions.

To be effective change agents, the Del Mod field agents have to be able to devote their full energy to their task. This often entails keeping irregular working hours and occasionally working overtime. Not unlike social workers, they are ready to assist at the ring of their phone. In 1972, Del Mod hired five field agents on a part-time basis. These agents remained as part-time teachers in their districts, and were groomed to become educational leaders in their district. Del Mod's administration found, however, that the part-time field agent/teacher was not as great an idea as it seemed. There were certain loyalty conflicts. The agents were expected to perform their two jobs with equal devotion and energy, but found that it was difficult to serve two masters at the same time. The idea was abandoned already the next fiscal year.[7]

The field agents receive back-up support from other Del Mod components. John Reiher, the Del Mod component coordinator and state science supervisor at the State Department of Public

Instruction facilitates the field agents' initial entry into schools.[8] The field agents' home base, the Del Mod resource center, not only provides the field agents with all the instructional materials they need, but also gives them clerical assistance and serves as their "answering service."[9] Field agents keep "their" resource centers meticulously informed about their whereabouts, and a teacher can locate a field agent or leave a message for him just by phoning the appropriate resource center. The Director's office assists the field agents by handling some of their routine correspondence and information exchange with school districts. The field agents think that Del Mod's Director, Mrs. Purnell, has been very effective in providing support for their work.[10]

The procedures for hiring field agents have been discussed thoroughly in another chapter of this report. Basically, the Del Mod Director conducts the actual selection, then lets the Augmented Council of Presidents or its Executive Committee review the candidate's background folder, and submits the candidate's name to the council for appointment.[11] The field agents are hired on a twelve-month basis, and are allowed twenty-one paid vacation days and all holidays that are observed by the University of Delaware. Originally, the field agents were ten-month employees, just like the school teachers that they assisted; but it was found necessary to have operational field agents available also during the summer months. The field agents' salaries are higher than those of Delaware teachers with a similar training and experience, but lower than those of supervisors. During Del Mod's five-year existence, the field agent component has received in excess of $350,000 from the National Science Foundation and about $230,000 from other sources. For purposes of retirement, health benefits, and longevity of service, the field agents were considered as employees of the State of Delaware.

The field agents originally were intended to work only for one year, after which time they would return to their respective districts and assume there a position of instructional leadership. As can be seen from Table I, in practically all instances all full-time field agents repeatedly got their contracts renewed and stayed with Del Mod until the start of its final fiscal year. At that time, three of the field agents found other educational leadership positions in the State of Delaware, while the remaining three field agents remained with Del Mod to its dissolution on June 30, 1976.

TABLE I

List of Del Mod Field Agents 1971-76

NAME	TITLE	Hired	Years of Service	
			Full Time	Part Time
Al Burkhardt	Science Field Agent	1971		½
Loretto Clark	Science Field Agent	1971	1	
James H. Gussett	Science Field Agent	1971	4	
Barbara A. Logan	Science Field Agent	1971	5	
Frances Barhydt	Science Field Agent	1972		1
Audrey Conaway	Proj. Asst. to Director's Office	1972	1	
Susan Hartzler	Science Field Agent	1972		1
Thomas Hounsell	Science Field Agent	1972		1
Dennis Reilly	Science Field Agent du Pont Fellow, Science	1972 1973	2	
Bruce Watt	Science Field Agent	1972	1	
Verne Wood	Science Field Agent	1972		1
Richard E. Cowan	Mathematics Field Agent	1973	3	
Meredith Griffin	du Pont Supervisory Intern	1973	2	
Peter Shannon	du Pont Fellow, Mathematics	1973	3	
Charles A. Wall	Science Field Agent Research Field Agent	1975 1976	½ ½	

The reason for the field agents' prolonged stay of duty is twofold. Firstly, the hired full-time field agents turned out to be extremely competent and dedicated individuals, and Del Mod as well as Delaware's teachers were glad to continue retaining their services. Secondly, all the field agents found their field agent positions so attractive that they were unwilling to return to their old schools as teachers. They especially enjoyed their freedom of planning and implementing their professional activities without having to be hampered by a myriad of administrative regulations and imposed non-professional tasks. One field agent characterized the lot of Delaware teachers with these words: "They know they are being punished. It's just a question of how long the sentence will be." So far, none of the full-time field agents have returned to teaching, and it is highly unlikely that the remaining agents will do so.

Some Del Mod individuals have expressed a wish that the field agent position should be a temporary job. It has been suggested that after two years, the field agent should go back to his old job.[12] John R. Bolig, Del Mod's Director of Research and Evaluation argues strongly in favor of a temporary field agent. He states that a new field agent brings with him a great amount of fresh enthusiasm, but that after three or four years of presenting the same "bag of tricks" to teachers, he has burned himself out and becomes "stagnant." Furthermore, Del Mod's original idea was merely to have the field agent "on loan" from his school. The longer the field agent stays with Del Mod, the less likely is he to return to teaching. Also, a long-term field agent tends to be regarded as an institution by the teachers he assists, and his eventual replacement will find it hard to become accepted if his methods or personality differ from those of the old field agent. Robert L. Uffelman, one of the originators of the Del Mod idea, suggests that the field agents should return to their teaching jobs after two or three years service. During their last year as field agents, they could train their replacements.

By mandate of the Augmented Council of Presidents, the Del Mod Director was responsible for all financial transactions affecting the field agents.[13] Therefore, all requests for reimbursement, supplies, and any matters pertaining to administration were to be forwarded directly to Del Mod's Director, Mrs. Purnell. In the opinion of other component directors, the field agents may have had an unfair funding advantage by

being under the direct supervision of the Del Mod Director.[14] Other components had to make their funding case to the Director, while she, subject to the Augmented Council, made her own determination about the field agent program. This situation changed at the beginning of fiscal year 1974-75, when, in preparation for Del Mod's phase-out, the administrative and programmatic decisions about the field agent component were transferred to Carlton W. Knight III, the Component Coordinator for the University of Delaware.[15]

The evaluation efforts by and of field agents are governed by two antithetical considerations which have not succeeded in evolving into a satisfactory synthesis. On the one hand, academically oriented evaluators and Del Mod personnel have suggested that the field agents spend more time documenting their impact and keeping detailed records of their activities and techniques. The original proposal and field agent job description specified such an emphasis. The obvious argument in favor of such an evaluation-centered approach is that Del Mod was an experiment in science education, and a careful record of essential data would be necessary for someone to successfully repeat this experiment at another time in another geographical locality. On the other hand, Del Mod was trying to fill a real need in the State of Delaware. The school districts were not concerned about the exact verification of Del Mod's progress to an unknown future client. They wanted help when help was needed. According to the State of Delaware Science Supervisor, the districts would prefer to see the field agents more frequently inside their schools and classrooms.[16] This impression was verified directly by the teachers in answer to a Del Mod questionnaire.[17] Certain bookkeeping duties and a severe case overload has prevented field agents from spending much of their time in any single school.

The only way to satisfy both of these considerations would have been to obtain funding for a much greater number of field agents. Each agent could then document his impact thoroughly, but would visit the teachers at considerably less frequent intervals.

Under the existing circumstances, field agents write a monthly report of their activities and a brief projection of their activities for the following month. These reports are forwarded to their component coordinator. After a project is completed, the field agents submit a brief written description

to the Director's office for inclusion in that year's annual report. These descriptions seldom contain objective impact evaluations. Occasionally, a field agent conducts self-evaluation for a project that he has been involved in. Del Mod's Director of Research and his staff actively assist field agents in such evaluative efforts.[18] The research director also maintains, organizes, and updates all data submitted by the field agents and other Del Mod components.[19] Further evaluative efforts pertaining to the field agent component include the yearly evaluation which the Director conducts of all Del Mod employees. The results of these evaluations are discussed with each employee and are eventually filed in the employee's personnel file. Finally, the various professional evaluations of the entire Del Mod System contain their fair share of information about the field agent component. Many of those findings have been summarized in various chapters of the present report.

The field agents are very satisfied with the way they are administered. They particularly appreciate the fact that they are allowed to function outside regular bureaucratic structures, with their ingenuity and professional integrity being their only guide. The freedom in their mode of operation may, indeed, be the key to the field agents' success and popularity in the State of Delaware.

FOOTNOTES FOR CHAPTER V

[1]Charlotte H. Purnell, Applying the Del Mod Model (Dover, DE: Del Mod System, 1972), p. 5.

[2]The Augmented Council of President, State of Delaware, A Proposal for the Del Mod System (The Delaware Model: A Systems Approach to Science Education). (Dover, DE: Submitted to the National Science Foundation on February 24, 1971), p. 62.

[3] Daniel L. Stufflebeam, "An Educational Evaluation Perspective," Del Mod System in Science Education. Report to the National Science Foundation, Project No. G.W. 7903 (Kalamazoo, MI: Western Michigan University, The Evaluation Center, June, 1974), p. 334.

[4]Alan Nowakowski, "The Traveling Observer Report on Del Mod," Del Mod System in Science Education, p. 115.

[5]Lincoln David Kelsey, Cooperative Extension Work (Ithaca, NY: Cornell University Press, 1963), p. 82.

[6]Thomas M. Baker, Del Mod at a Glance, Volume II: A Synopsis of the 1972-73 Annual Report for the Del Mod System. (Dover, DE: The Office of the Del Mod Component Coordinator for the State Department of Public Instruction, June 30, 1973), p. 27.

[7]The Augmented Council of Presidents, State of Delaware, A Proposal for Renewal of Grant No. G.W. 6703, The Del Mod System (The Delaware Model: A Systems Approach to Science Education). (Dover, DE: Submitted to the National Science Foundation on May 1, 1974), p. 11.

[8]Minutes of Del Mod Field Agent Meeting, October 12, 1971, and John F. Reiher, The Role of the State Department of Public Instruction in the Del Mod System (Dover, DE: Office of the Del Mod Component Coordinator for the State Department of Public Instruction, 1974), p. 11.

[9]Eleanor F. Sloan, Science-Math Resource Center: What Makes It Go. (Dover, DE: Office of the Del Mod Component Coordinator for the State Department of Public Instruction, 1974), p. 5.

[10]Charlotte H. Purnell, "The Del Mod System Technical Education: Internal Response to Request for Additional Information." A Document written for the Augment Council of Presidents (Dover, DE: Del Mod System, October, 1974), pp. 73 and 83.

[11]Stufflebeam, p. 357.

[12]Robert L. Uffelman, interview held at Newark, DE, April 1, 1975 and frequent conversations with John R. Bolig, Del Mod's Research Director.

[13]Minutes of Del Mod Field Agent Meeting, October 12, 1971.

[14]Egon G. Guba, "The Del Mod Project: An Educational Change Perspective," Del Mod System in Science Education, p. 237.

[15]The Augmented Council of Presidents, State of Delaware, A Proposal for Renewal of Grant No. G.W. 6703, The Del Mod System (The Delaware Model: A Systems Approach to Science Education) (Dover, DE, January 1, 1975), p. 11.

[16]John F. Reiher, interview held at Dover, DE, May 15, 1975.

[17]Uldis R. Goits, "Teacher Reactions Toward Del Mod Field Agents," Typed Del Mod Document (July, 1975), p. 6.

[18]A Proposal for Renewal...(1974), p. 25.

[19]Charlotte H. Purnell, Del Mod System: Annual Report 1972 (Dover, DE: Del Mod office, September 30, 1972), p. 19.

CHAPTER VI

GOALS AND IMPACT

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From the very beginning, Del Mod's extension activities were based on the philosophical assumption that teachers must be reached where they are--not only at their physical location, but also at their current stage of education and their level of interest and understanding. Concomitantly, the goals and objectives of Del Mod's field agents have never been tied to any single philosophy of learning. The agents' intent has been to show the teachers how to think, not just what to think. Consequently, the field agents' main thrust has been in the realm of teaching strategies and curriculum planning, rather than in the pursuit of subject knowledge. The "how" rather than the "what" is emphasized also in dealing with teaching strategies. Instead of trying to imbue the teachers with a predetermined set of skills, the agents aim at getting the teachers to develop a variety of teaching strategies that would enable them to teach in such a way that learning would take place.[1] Frequently, the field agents' main task is to strive to inspire each teacher to produce maximum effect from the skills that teacher already possesses and feels comfortable with. However, if a particular teacher favors the lecture method, the field agents make a point of strongly encouraging more lab-oriented classroom design and activities, so that the students will become more actively involved instead of merely sitting as passive observers. The field agents see hands-on experiences not just as a devise for capturing the students' interest, but also as a means of preparing the students for the type of job experiences they will encounter if they choose a career as lab assistants or other types of science technicians. One Del Mod field agent points out that most students who choose science as their field of study eventually become technicians--only a small minority become theoretical scientists. To be effective technicians, they need an in-depth preparation in science which includes a significant amount of hands-on lab experiences. Needless to say, most students, whether they be science majors or not, distinctly prefer hands-on experiences to lecture-type classes.

The field agents see themselves as facilitators or catalysts that inspire teachers to action. They resist doing the

teachers' work for them, but instead help them acquire enough knowledge and confidence to determine their own needs and find and implement solutions to their own problems. Thus, when field agents conduct projects in individual schools, they work on problems that have been identified by the teachers themselves.

Research in various countries and time periods has repeatedly shown that field agents are a highly effective mechanism for the adoption of innovations. Del Mod's field agents are no exception to this pattern, and they are definitely perceived positively in the field.[3] It is, however, very difficult to document immediate success with a teacher. In the case of Del Mod, several factors combine to compound this difficulty even further. Firstly, of all the monies given to Del Mod, only about 5% went into evaluation, even though considerably more had been requested.[4] When NSF was requested to double the funds assigned to evaluation, the request was denied.[5] Secondly, Del Mod's philosophy has always been to emphasize its programs and to deny no one its assistance. This philosophy precluded the establishment of statistical control groups to whom Del Mod assistance would be denied. It also meant a reluctance to administer pre- and post- tests to project participants, for such an activity might be resented by some of the participating teachers and would steal time away from the actual conduct of the program. Thirdly, the Del Mod objectives, as stated in the original proposal, are not considered specific enough to be measured objectively.[6] Fourthly, the principle of voluntary cooperation that exists between Del Mod's various components makes it difficult to enforce uniform and regular evaluation procedures. This merely indirect control over any single component has also put a road-block in the way for any systematic cycles of development and implementation that might have been based on those pieces of formative evaluation that indeed were collected.[7]

For the above reasons, the success of the Del Mod field agent component, although disputed by some, has not been documented in an orderly goal-oriented manner. Nevertheless, the field agents' impact was gauged at various times by subjective, by objective, by goal oriented, and by responsive evaluation methods. Already the original proposal listed as one of the field agents' duties to maintain "accurate records of techniques, successes, failures, and any test results of target groups," and to "provide assessment feedback data on needs, problems, and assessment of individual competencies."[8]

The 1973 Renewal Proposal clarified further that field agents are "requested to pre- and post-test participants in their projects as well as write monthly and final reports."[9] Field agents carried out their data collecting activities to a considerable extent--with the exception of the pre- and post-tests. Such tests were conducted rarely. The field agents were not familiar with the role of the evaluator and preferred to devote their time to actual program activities. Their evaluations of the success of their projects were generally based on their subjective perceptions, and on informal reactions from a small number of participants. The agents shared their experiences with the rest of the Del Mod System in their monthly reports. Another vehicle for feedback were the field agents' get-togethers. Already in September, 1971, at the very outset, the Del Mod Director sent out a letter to the two field agents and all of the component coordinators proposing monthly dinner meetings. In these meetings, the participants informed each other of problems and activities and considered future directions. In the case of the field agent component, subjective evaluative data definitely played a formative, if subtle, role.

Foundations for an objective evaluation were laid by Del Mod's Research Director, Dr. John Bolig, who collected and updated baseline data against which Del Mod's success might be measured.[10] The first formal attempt to produce an objective evaluation of certain aspects of the impact of Del Mod's field agents was made by Horace F. Darlington, Jr.[11] His conclusions will be referred to later in this chapter. A thoroughly formalistic and goal-oriented evaluation of all Del Mod's components was conducted in 1974 by a visiting team of academically trained evaluators from the Western Michigan University.[12] Upon this evaluation team's suggestion, the NSF finally relieved the workload of Del Mod's overburdened Research Director by providing him with funds for the hiring of a technical writer and a research technician. The newly hired technical writer was charged with writing the present in-depth study of the Del Mod field agents. During the period of September, 1975 through January, 1976, a team of educators and science teachers visited Del Mod's various components as part of Del Mod's attempt to assess its impact through the informal evaluations of a variety of experts in science and math education. This evaluation team adhered relatively closely to the theories of "responsive evaluation" proposed by the well-known evaluative innovator Robert E. Stake. The

results coincided closely with the subjective impressions gained by Del Mod's field agents, and will be referred to later in this chapter. All evaluative efforts indicated that the Del Mod field agents had had a discernable impact on Delaware's teachers, students, school administrators, science and math programs, as well as on Delaware's University and colleges.

There is much subjective evidence of a growing amount of professional enthusiasm among Delaware's science and math teachers.[13] The Del Mod field agents themselves are enthusiastic about their roles and are thoroughly convinced that they have made a strong impact on individual classrooms and schools.[14] The feedback from the schools and the reception of the reception of the agents by the teachers is heartwarmingly good. Dr. Egon Guba of the NSF-sponsored evaluation team reported improved teacher morale and a feeling on the teachers' part of "coming alive."[15]

Delaware's science and math teachers have participated in great numbers in Del Mod's projects. About 80 percent of those teachers who were eligible for Del Mod projects did participate. Del Mod's field agents had concentrated their efforts on junior high school teachers, and of these teachers, 95 percent participated. The average participant has been enrolled in somewhat less than two Del Mod projects.[16] The high participation rate is in part due to the excellence of the programs themselves, in part due to in-service credit granted for many Del Mod programs, and in part due to the provision of time to take advantage of the programs. The relatively small percentage of "eligible" teachers who did not participate were hesitating primarily because they simply were not well enough informed about Del Mod's programs. A second reason for non-involvement was the time element involved. In addition to their classroom duties, many science and math teachers are involved in coaching, student clubs, the production of theater plays, "moonlighting" jobs, and other activities that considerably limit their available time and energy for professional self-improvement.[17] Del Mod has tried to avoid infringement on the teachers' free time by providing the participants in many of its projects with release time and by paying for their substitute teachers.

There is much subjective evidence that Del Mod field agents do effect changes in the teaching style in the classroom. In response to a Del Mod survey of 153 teachers, an

impressive two out of every three admitted a considerable impact on themselves and their classes by Del Mod's field agent activities. Every fourth teacher stated that the field agents had had an extremely high impact on them.[18] One field agent states that about one-third of the teachers in her seminars were "traditional type" teachers, with little or no interest in innovations. The field agent claims to have seen a "180° turn" in them. Egon G. Guba, of the Stufflebeam evaluation team, also noticed changes in teaching style with much more "hands-on" work for students and more open methods utilized by teachers.[19] Del Mod video-tape specialist Bruce Watt conducted a longitudinal study of participants in one of field agent Barbara Logan's inservice programs. The video-tapes made during 1973 showed that teachers were teaching a more lab-oriented program than indicated by tapes of the same teachers made the previous year.[20] The first extensive objective evaluation of the effect of Del Mod field agents on the improvement of science instruction in Delaware schools was Horace F. Darlington's Ed. D. dissertation. The purpose of his study was to determine whether Delaware public school teachers of grades three to six, who worked with a Del Mod field agent for a year demonstrated significantly different understandings of the nature of science and scientists and significantly different teaching methods from teachers who had never worked with a Del Mod field agent.[21] He reached the conclusion that teachers who spend a year working with a Del Mod field agent probably use an inquiry-based approach and individualized instruction techniques in teaching science to a significantly greater extent than those teachers who have never worked with a Del Mod field agent.[22]

Teachers who have been involved with Del Mod have changed their teaching style and added new ideas to their classroom activities. But, beyond that, great numbers of them have extolled the benefits derived from the mere opportunity of exchanging views and opinions and interacting with other Delaware teachers attending Del Mod's group projects.[23] The participants, in turn, have become Del Mod "salesmen," encouraging their colleagues to take advantage of the services offered.[24]

In dealing with teachers, Del Mod field agents have learned that working with teachers who have never worked with Del Mod before involves considerable investment of the field agent's time and yields merely a moderate return of concrete

results. The project participator is most open to Del Mod impact during the second year.[25] The form of the second year program with the same teachers must not be a repeat of the same type as the preceding year, for the teachers are then ready for a more specific program. After two or three years contact with the same teachers, not much additional change can be enacted. Nor is it likely that change will take place, if it has not done so during this period.[26]

Field agents have formed a certain image in their mind of the type of teacher who generally is receptive to field agent impact. The composite profile of a receptive teacher, as described by Del Mod's field agents, shows a teacher who is extrovert and enthusiastic. He has to have openness toward change and has to want some change. The teacher is confident, but not overconfident. He is not short-tempered and is willing to accept the opinions of others. He does not provide the students with the answers until he is asked to. He is student-oriented, and is concerned about not being able to reach his students. Often, he is frustrated by the curriculum, by the lack of materials, or by the type of materials he uses.

The unreceptive teacher, on the other hand, seems extremely satisfied with what he is doing. He displays an air of overconfidence, but actually feels threatened and insecure and acts very defensive in the field agent's presence. He has an educational theory that has worked to his satisfaction in the past, and he is not willing to improve on it. In the classroom, he has the attitude of a dictator. He never tries anything new and does not give a hoot whether he is meeting the needs of his students. He is a belligerent and self-satisfied person.

Field agents admit that the receptivity or unreceptivity of a teacher is often a matter of how well his personality interacts with that of the field agent. A field agent can effect change easier, if the teacher thinks similarly to the field agent. If the teacher has a different attitude than the field agent, change will be harder to effect. All field agents state that the age of the teacher is definitely not a factor in determining the openness to new ideas. Field agents also warn against judging the receptivity of a teacher on the basis of first impressions. Such impressions have often proven wrong after a closer relationship has been established.

Even though Del Mod's field agents see themselves as guiding and assisting teachers rather than students, they all consider the students as their indirect but ultimate target. The field agents hope that as a result of better motivated and more activity-oriented teachers, students will begin to actually enjoy science and mathematics. The agents would like to see students who are competent and secure and familiar with such processes of science and mathematics as observation and classification. The students should not necessarily have a superior content knowledge, nor should they feel that the ultimate source of knowledge is a book. Instead, they should be able to draw conclusions from direct observations. Del Mod field agents would rather see a student who produces reasoned but wrong conclusions than one who memorizes correct facts that he cannot substantiate through his own reasoning.

Unfortunately, there are no reliable tests that can be administered to a large audience to test the process-oriented science programs that the field agents advocate.[27] One math field agent, when asked how to measure his residual impact on the students, simply stated that he did not know. His answer points to the difficulties some field agents encounter in assessing their own effectiveness--provided that they even find time for such an exercise. Other field agents stated that they would consider it an indication of desirable field agent impact, if students showed an enjoyment of science and/or math. They suggested that such as impact might be recorded by noting whether science enrollment has been going up or simply by asking the students what subjects they like and why. Also, attitudinal tests have been suggested as a means of revealing field agent impact on the students. Recent Delaware TOUS (Tests on Understanding Science) scores indeed are gratifyingly higher than those of previous years.[28] Two field agents also expected an improvement in the students' knowledge of basic science facts and an accompanying rise in standardized test score results. Standardized testing in Delaware is conducted by the Research Division of the State Department of Public Instruction. According to the results of a nation-wide study conducted by the Education Commission of the States' National Assessment of Educational Program (NAEP), the American students' grasp of science has decreased significantly in the past four years.[29] In contrast, recent Delaware test results show that the scores on science tests have either not changed significantly or have actually increased.[30] In addition, while there has been a national

lessening of interest in science, Delaware's science enrollments are equal to or greater than those of the peak popularity years of the late 1960's.[31] It has also been observed that students now are engaged in much more "hands-on" classroom activities.[32]

Del Mod field agents have also exerted a certain influence on school administrators. The results of a survey of Delaware teachers indicate that 15 percent of the respondents thought that Del Mod field agents had had an extremely great impact on their principal.[33] Although this impact is probably less significant than that on the teachers, it has been observed that district and statewide administrative officers are now more involved in science education and teachers feel a greater amount of support from these leaders.[34] There is even subjective evidence that the example of the field agents' non-threatening approach has served to alter the roles of superintendents, principals, and other similar personnel throughout the state.[35]

Just as Del Mod field agents seem to have a rather clear idea of how to recognize a receptive or unreceptive teacher, they also have definite ideas about receptive and unreceptive schools. The most important requirement for a school receptive to change is a school administration that already actively supports a strong science program. It is an administration that provides its teachers with all possible support and openly encourages and requests outside assistance. The receptive school has a good rapport between teachers and administrators, and the teachers have a feeling that the administration is listening and responding to their opinions.

The unreceptive school lacks organization and a delineation of responsibilities. The administration is aloof and does not get involved in what is happening in the classroom. The staff is cool, defensive, and self-satisfied. There are conflicts within the administration and conflicts between administrators and teachers. Nobody has previously worked with the school, and the school is afraid of outside help. There is no unity among teachers. They all do their own little thing and do not care about what is going on next door. In such schools, the teachers feel their work is not that important, and they will be suspicious of any outsiders entering their school or classroom. Their attitude is "Why cooperate, when nobody is going to listen to me anyway." Curriculum and equipment in such schools is usually outdated.

One field agent feels he can spot an unreceptive school just from its looks: "It's dirty and messy, and the lights are out. The school just looks dismal. You feel drab in it."

On the whole, school administrations have viewed Del Mod's assistance very favorably, and Del Mod has been able to assist with some noticeable improvements in the state science and math programs. Among the main problem areas in pre-Del Mod Delaware were the use and availability of proper facilities for the teaching of science.[36] By 1974, three years after Del Mod's start, middle school science programs had not changed drastically. Yet, class sizes had diminished, and there were better equipped labs.[37] Del Mod's greatest impact on science programs among middle schools was in the areas of environmental education and in multi-text teaching methodology.[38] As in 1969, science texts, materials, and curricula were still, to a large extent, not selected by the teachers themselves, but rather imposed on them by their school and district administrators. There still was a lack of sincere commitment to science in grades one through four in many schools. Teachers have been expressing a need for direction and Del Mod's field agents have, in the last few years, become deeply involved in curriculum projects. These curriculum projects have proven tremendously popular with the teachers, for they now have a vehicle through which they can actively participate in the shaping and implementation of curricula for their own classroom, school, and district. Field agents serve as advisers, coordinators, and active participants in these projects, and have played an essential role in the development of science and math curricula.[39]

Partly due to the efforts of Del Mod's field agents, a greater congruence between the theory and practice of science education programs is now emerging in Delaware.[40] Due to a greater awareness of available innovations and a greater willingness on the part of teachers and administrators to adopt them, sharply changed ordering patterns of curriculum material has been observed. There has been a shift toward manipulative materials, and teachers openly admit that the materials either were first introduced to them by field agents, or that they saw the materials in a Del Mod Resource Center.[41]

In some districts, the Del Mod field agent programs meant the difference between a science program and none. They had the effect of causing science to be taught on a

regular basis, sometimes even in a departmentalized situation.[42] One Del Mod supervisory intern, who served as a science supervisor in an urban district tells the following success story:

> Before 1972, there was an isolationist feeling in the district. Summer 1972, a Del Mod workshop was given. Its participants talked to others about Del Mod. Teachers have since been involved in all kinds of Del Mod activities. Teachers now know about Del Mod and are thankful to it. Our science program would not have come this far, were it not for Del Mod. Before Del Mod, the district had nobody to help with the curricula. The science education program is now starting--we didn't have any before. We now have the SAPA workshop. Teachers are taking a special interest and the students are so interested that I expect their scores to go up. We had no science objectives before. Now all teachers work for the same types of objectives.[43]

The impact of Del Mod's field agent programs has left an imprint also on Delaware's three state institutions of higher learning. Each of the three institutions, the University of Delaware, Delaware State College, and Delaware Technical and Community College, houses one of Del Mod's three resource centers. The University housed two field agents, Delaware State College housed one, and Delaware Technical and Community College housed one.

The focus of Del Mod's activities was on the field and only incidentally on changing the outlook of the University of Delaware. Yet, University personnel have originated and conducted so many Del Mod projects that the University has considerably accelerated the revision of its own teacher education programs, courses, instructional materials and teaching strategies.[44] The University has become quite extension-oriented. It is providing more service to a greater number of school districts than it has done in the past. The University has patterned field projects in reading, vocational education, urban education, and economics on the Del Mod example.[45] It also has successfully experimented with the use of competent teachers as field instructors at various centers throughout the state, under the supervision of one University faculty member.[46] Presently, the University is in the process of establishing a one-year environmental field agent in Delaware's Sussex County, with the DuPont Company

paying the agent's salary. The agent would make use of Del Mod's Resource Center materials and facilities. After one year, the field agent would resume teaching in his old district.

The field agent idea has also caught on at Delaware's Department of Public Instruction. Its Division of Planning, Research, and Evaluation proposed and obtained federal funds for the employment of a field agent, a coordinator, and information specialists to assist districts in obtaining information needed to remedy problems in instruction.[47]

Del Mod's field agents are regarded very favorably. The nationally prominent evaluator, Egon Guba, states that "literally everyone I spoke to had the highest opinion of the field agents."[48] In a few years, Del Mod's field agents have become a well-known institution in the State of Delaware. When a school needs assistance with in-service training or program development, it often turns to Del Mod. One field agent gives an example: "A guidance counselor called me recently. He was charged with organizing an inservice day. The teachers told him 'get Del Mod,' so he called me. Even children have started to write us and request materials." The teachers' only criticism of field agents appears to be that there just aren't enough of them. Also, some professional evaluators have suggested that for a more meaningful coverage, each district should have its own field agent.[49] The reality of Del Mod's limited funding has, of course, not permitted the establishment of one field agent in each of Delaware's twenty-six school districts. At one time, most of Delaware's school districts indeed had each their own science supervisor. If that situation had prevailed, Del Mod's field agents might not even have been needed, but due to financial considerations all but three districts have had to forego the luxury of having their own science supervisor.

Del Mod's field agents have filled a sorely felt need in Delaware. When the first blueprint of the Del Mod field agent concept was drawn, most of the concerned individuals shaping and creating this concept felt that the field agent component would be the strongest member of the Del Mod System.[50] Dr. Donald W. Humphreys, in summarizing the results of Del Mod's final evaluation by a team of responsive evaluators, confirms the implementation of this original intention: "All evaluators evaluating the field agent component of the Del Mod program stated that this was the most important part of the System.[51] The field agents were indeed the backbone of the

Del Mod System, bearing the brunt of the burden--and enjoying it. Without a model to copy, they have become successful change agents and have indisputably raised the quality of science and math education in Delaware.

Finally, the field agent experience has had a lasting impact on the field agents themselves. They have not only taught how to teach, but they also have learned from their experiences. In some instances, a field agent visiting a classroom learns more from the teacher than the teacher from the agent. One field agent recalls that a principal once requested him to provide individual assistance to a superbly competent teacher. The teacher did all the right things with her pupils and really had no use for the field agent. The agent did not mind this seemingly futile assistance project at all. He explained: "This gave me an opportunity to learn something from her rather than the other way around. Perhaps that's the real reason the principal wanted me in her classroom." All Del Mod field agents have come to realize that the field agent position also provides an unbeatable learning experience. One of Del Mod's part-time field agents has written the following words in his monthly activities report: "I have learned more about teaching methods and the do's and don't's of teaching this year than in all my course work and teaching experience combined." As a result of the Del Mod project, the State of Delaware has thus produced a cadre of ideally trained and experienced science and math educators who, whether they return to teaching or occupy administrative posts, will be superbly equipped to continue improving the quality of science and math education in their school, district, and state.

FOOTNOTES FOR CHAPTER VI

[1]Barbara A. Logan, Inservice Education and the Del Mod Field Agent. Del Mod Monograph. (Dover, DE: Office of the Del Mod Component Coordinator for the State Department of Public Instruction, 1974), p. 5f.

[2]The Augmented Council of Presidents, State of Delaware, A Proposal for Renewal of Grant No. GW 6703, The Del Mod System (The Delaware Model: A Systems Approch to Science Education). Renewal Proposal to the National Science Foundation (March, 1973), p. 15.

[3]Daniel L. Stufflebeam, "An Educational Evaluation Perspective," Del Mod System in Science Education, Report to the National Science Foundation, Project No. GW 7903 (Western Michigan University, The Evaluation Center, June, 1974), p. 343.

[4]John R. Bolig, "A Description of Del Mod and its Evaluation," Del Mod System: Final Report, Volume I (Dover, DE: Del Mod System, 1976), passim, and Charlotte H. Purnell, "The Del Mod System Technical Evaluation: Internal Response to Request for Additional Information," Del Mod Document (Dover, DE: Del Mod System, October, 1974), p. 39.

[5]Purnell, ibid., p. 28.

[6]John R. Bolig, Del Mod at a Glance, Volume III: 1973-74 Annual Report for the Del Mod System (Dover, DE: The Office of the Del Mod Component Coordinator for the State Department of Public Instruction, October 30, 1974), p. 31.

[7]Purnell, Response, p. 48, and Earle L. Lomon, "The Del Mod Project: A Science Perspective," Del Mod System in Science Education, p. 269.

[8]The Augmented Council of Presidents, State of Delaware, A Proposal for the Del Mod System (The Delaware Model: A Systems Approach to Science Education), A Proposal to the National Science Foundation (February 24, 1971), p. 62.

[9]The Augmented Council of Presidents, 1973 Renewal Proposal, p. 49.

[10]Charlotte H. Purnell, Del Mod System: Annual Report 1972. (Dover, DE, September 30, 1972), p. 20.

[11]Hor[illegible] F. Darlington, Jr. "An Investigation of the Del Mod Field Agent Approach to Improving Science Instruction in the Elementary School" (Unpublished Ed. D. Dissertation, Temple University, 1975).

[12]Daniel L. Stufflebeam, Director, Del Mod System in Science Education. Report to the National Science Foundation, Project No. GW 7903. (Western Michigan University, College of Education, The Evaluation Center, June, 1974).

[13]Purnell, Annual Report 1972, p. 21.

[14]Daniel L. Stufflebeam, p. 357.

[15]Egon G. Guba, "The Del Mod Project: An Educational Change Perspective," Del Mod System in Science Education (Western Michigan University, The Evaluation Center, June, 1974), p. 227.

[16]Bolig, Del Mod at a Glance 1973-74, p. 27.

[17]The Augmented Council of Presidents, State of Delaware, A Proposal for Renewal of Grant No. GW 6703, The Del Mod System (The Delaware Model: A Systems Approach to Science Education). Renewal Proposal to the National Science Foundation (March, 1972), p. A-110.

[18]Uldis R. Golts, "Teacher Reactions Toward Del Mod Field Agents." Typed Del Mod Document (May, 1975), p. 4.

[19]Guba, p. 227.

[20]Bruce Watt, "Logan Study," Del Mod Project No. 72-39, an In-House Del Mod Document, p. 3.

[21]Darlington, p.11.

[22]ibid, p. 86.

[23]Alan Nowakowski, "The Traveling Observer Report on Del Mod," Del Mod System in Science Education. Report to the National Science Foundation. (Western Michigan University, The Evaluation Center, June, 1974), p. 127.

[24]Purnell, Annual Report 1972, p. 21.

[25]Bolig, Del Mod at a Glance, 1973-1974, p. 21.

[26]The Augmented Council of Presidents, State of Delaware. A Proposal for Renewal of Grant No. GW 6703, The Del Mod System (The Delaware Model: A Systems Approach to Science Education). Submitted to the National Science Foundation (Revised on May 1, 1974), p. 10.

[27]Ruth E. Cornell, John R.Bolig, and Audrey Conaway, The Status of Science Teaching in Delaware (Dover, DE: Office of the Del Mod Component Coordinator for the State Department of Public Instruction, 1974) p. 25.

[28]See Del Mod System: Final Report, Volume I, passim.

[29]"Science Knowledge Declining in American Schools," The School Administrator (April, 1975), p. 1.

[30]Conversation with Del Mod Research Director John R. Bolig on June 2, 1976. Also see John R. Bolig and Charlotte H. Purnell, "A Description of Del Mod and its Evaluation," Del Mod System: Final Report, Volume I (Dover, DE: Del Mod System, 1976), passim.

[31]Charlotte H. Purnell, "Foreword," in Thomas M. Baker's Del Mod at a Glance, Volume II: A Synopsis of the 1972-73 Annual Report for the Del Mod System (Dover, DE: The Office of the Del Mod Component Coordinator for the State Department of Public Instruction, June 30, 1973), p. i.

[32]Guba, p. 227.

[33]Golts, p. 5.

[34]ibid.

[35]ibid., p. 275.

CHAPTER VII

THE [illegible] FIELD AGENT COMPONENT

IN A [illegible] PERSPECTIVE

THE DEL MOD FIELD AGENT

COMPONENT IN A CHRONOLOGICAL PERSPECTIVE

The extension or field agent idea is old, true, and tried. An outstanding example of a successful field agent program is the Extension Service of the United States Department of Agriculture. Del Mod's founders consciously took the Extension Service as a model. In the minutes of the Del Mod organizational meeting with Governor Peterson and National Science Foundation staff on March 21, 1970, the term "county educational agent" was used for the proposed Del Mod field agents.[1] This term was coined in direct imitation of the county agricultural extension agent. Extension work in the United States began in a nationwide way in 1914, but had its philosophical beginnings in early agricultural societies from the time of the organization of the Philadelphia Society in 1785.[2] The strength of Agricultural Extension in the United States lies primarily in its county extension agents - agents who have their office in the counties and live among the people they serve. Similarly, the field agents have become the lifeblood of the Del Mod System.

The idea of a Del Mod field agent component was formulated first by Del Mod's present Director, Mrs. Purnell. The idea came to her in 1969, when she was the State Science Supervisor. The idea crystallized quickly in discussions with educators and politicians. Another early contributor to the Del Mod idea was Robert Uffelman of the University of Delaware, who had had some experience with field-agent and systems concepts. Mrs. Purnell's thorough needs assessment of Delaware's science education was published in 1969 and provided further justification for a cadre of field agents that could visit and effect change in individual teachers and classrooms.[3] The Del Mod concept received a National Science Foundation "mini-grant" for a trial run during the fiscal year 1970-71, and the field agent concept was written into the initial proposal for the establishment of the Del Mod System.

The field agent concept was advocated by the Science Supervisor of the Department of Public Instruction.[4] At that time, Departments of Public Instruction could not receive direct funding from the NSF. Financial considerations had caused Delaware to eliminate practically all of its district science supervisors, and the Del Mod field agents were seen as a way to fill the resulting void.

The pre-Del Mod trial field agent program was conducted by John F. Reiher under the supervision of Charlotte H. Purnell and Robert Uffelman. Mr. Reiher conducted an inservice training program for all but a handful of the junior high school

[illegible] Kent and Sussex Counties in Delaware. On February 1, 1971, Delaware's Science Supervisor, Charlotte [illegible] Purnell, was appointed as Del Mod's State Director, and John F. Reiher became the new Science Supervisor. A new field agent was hired on a part-time basis to do some follow-up on the trial project's participants. The Del Mod System began officially on July 1, 1971. Its first two official field agents were hired and began their duties in the fall semester of 1971. Late [illegible] Supervisor, John F. Reiher, facilitated their initial [illegible] into schools and gave advice based on his own previous Mod field agent activities.

The field agent program proved very popular, and the field agents soon received more requests than they could effectively handle. Agreement was reached that all field agents should limit their contacts to the number of people they could handle without being "spread too thin." It was generally recognized that this critical number should not exceed one hundred. In a further effort to alleviate the field agents' case load, Del Mod began providing grants in the fiscal year 1972-73 to the various school districts to conduct projects under their own leadership. These grants for small amounts of money made it possible for districts to plan curriculum articulation projects.

Following [illegible] findings of Delaware mathematics educators, the Del Mod proposal for the fiscal year 1973-74 included a provision for math field agents, and two such agents were hired. In the same fiscal year, with the aid of funds from the du Pont Company, a field agent was assigned to the Wilmington school district, where he was to function essentially as the district science supervisor. The Wilmington School District was the only one that was unionized, and union rules did not provide for a field agent position. The agent had to choose to be assigned as a teacher or as a supervisor. He chose the supervisor's role. The value of his contributions was recognized by the district. Beginning with the fiscal year 1975-76, he was appointed as the district's official science supervisor and his salary henceforth was provided by the district.

A significant development occurred on July 1, 1975, when the field agent component was put under the administration of the University of Delaware. The University of Delaware Component Coordinator, Carlton W. Knight III, became the direct supervisor of all the field agents. The change was part of Del Mod's phase-in considerations and prepared the University for a possible take-over of the field agent activities after Del Mod's demise. The effects on the field agents was both procedural and programmatic. Under the University, there was more paperwork and matters tended to become more complicated. Requests had to have a lot of signatures and, at least initially, neither the field agents nor the University had quite worked out the proper channels to follow. Programmatically, field agents were affected by a reduction of monies available to

substitute teachers. This meant a reduction in the number of seminars offered by field agents. The science field agent at the University of Delaware stated that the seminars had provided a very good starting point for initial contact with teachers and had helped teachers evaluate their own work.

In taking charge over the field agent component, the Component Coordinator proceeded very cautiously with the institution of programmatic changes. He states:

> "The field agents operate very independently. I prefer, especially initially, to stay out of the field, so that they don't get the impression I am snooping. I was very cautious about changing previous supervisor practices. When they were administered by Charlotte Purnell, they operated pretty much independdently. When I took over initially, I was very aware of their loyalty to the Del Mod Director. I also sensed a certain hostility toward the University. I particularly avoided any activity that would make the field agents feel uncomfortable. I particularly stayed away from on-site supervision until we had established a relationship.[8]

Yet, changes were instituted. Field agents began meeting at regular intervals and were required to provide more thorough written accounts of their activities. Program planning and coordination of activities became more structured and the field agents and their Component Coordinator worked more as a unit. In preparation for the end of Del Mod, field agents now became engaged in various plans for at least partial self-sufficiency. Time studies were conducted, and Dr. Knight and the field agents investigated the possibility of developing instructional units, field-trip packages, summer vacation college, and science-oriented summer camps.[9] This increased effort of self-documentation is welcomed by present and future evaluators of Del Mod, and it is hoped that based on these data, Dr. Knight will eventually produce a thorough cost and time analysis of field agent activities. On the other hand, John F. Reiher, the erstwhile pre-Del Mod field agent, now Science Supervisor for the State of Delaware, sees a definite difference in the present field agent philosophy from the one he had and which he claims the early field agents had. He states:

> "We were to serve classroom teachers. Now the field agents are involved in paper work. They should be in schools."[10]

Another more subtle change has taken place. As the field agents stayed on year after year, there has occurred a certain

confusion or merging of the field agent as a person and the field agent as an institution. Field agents have lingered on so long in their jobs that when they "jump ship" toward the end of the Del Mod project, their position disappears with them. The concern is no longer for the field agent position, but only for the continued employment of the field agent as a person. As a result of this attitude, at the termination of Del Mod, there were only one science field agent, two math field agents, and one research field agent. The duties of the latter were confined strictly to the Research Director's office.

It would, however, be unfair not to mention certain advantages that come with prolonged service as field agents. One field agent states that he initially worked only with individual teachers. In order to work with groups of teachers, he first had to establish credibility. Now he has credibility and county-wide recognition. He now can handle larger groups for the teachers now are convinced that he knows what he is talking about and are willing to listen to his ideas and suggestions.

Prolonged field agent duty not only acquaints the teachers with "their" field agent's ability, but also serves to add to that ability. All the field agents have grown on their job. One field agent states:

> "Last year I had no specific program. I worked in far too many districts. There was no real organization. I would not know what to do in each school. This year, I document what I do. I now spend the majority of my time in three districts. I ask for requests to be put in writing. Teachers have started to know me now. Last year, people didn't know about my existence. I feel more confident now. I don't waste time with "deadbeats." I want to know what it is they want me to do in the school. I often ask for a commitment from the school.

Another field agent states that he has become a bit more callous now and is leery of being taken advantage of.

There are advantages to serving an extended tour of field agent duty. Yet, these advantages can all be achieved within a two-year period. A longer service than that can result in a decrease of the agent's initial enthusiasm, spontaneity, and energy. It is also very difficult for a new field agent to gain full confidence of teachers who for several years have worked with another agent.

The possibility for a direct continuation of Del Mod field agent activities beyond the termination date of NSF funding looks extremely remote. The State Department of

Public Instruction has not found it financially possible to absorb the field agent component. The University has not been overly enthusiastic about incorporating field agents in its structure and, more or less by default, has left the decision up to the head of the Department of Education, who is inclined negatively toward University-connected field agents. Problems encountered in the attempts to integrate the field agent component into the University include University staffing regulations concerning salary levels, promotion, and tenure. These matters had not been considered when the field agents were hired. Mrs. Purnell, the driving force behind the field agent idea, has already accepted another educational leadership position and can no longer continue a full-time campaign for the field agent idea.

In spite of the abrupt end to the field agent concept, a certain amount of planning had been undertaken to prepare for some type of phase-in of the Del Mod field agents into some other educational component after NSF funding stopped. The transfer of the administration of the field agent component to the University of Delaware (in fiscal year 1974-75) was one such step.[11] University Component Coordinator, Carlton W. Knight III, has devoted much effort on developing plans to phase in Del Mod activities into the regular operation of the University.

The Augmented Council of Presidents and the Coordinating Council on Teacher Education agreed with the Del Mod Director that steps should be taken to move the Del Mod field agent component into regular State institutional programs. Several methods have been discussed in the last few years how to generate income to cover the cost of operational expenses for field agents.[13] Early thinking suggested the setting up of a small foundation from those industrial and private funds, which already were accruing to Del Mod. This foundation could be administered by a competent and respected teacher who would be responsive to a five-man board.[14] Field agents would be teachers released for one year from their schools. Each field agent could have a drawing account from the accumulated fund.

Another suggestion was to include the field agents in the continuing education division of the University of Delaware. They would be assigned adjunct positions specially created for field services only. The cost of their salaries and expenses could be shared between the University and the schools the agents would serve. To save money on substitutes for teachers, efforts could be made to use district inservice time for this purpose.[15] Each participating teacher might also be charged a small fee for workshops and seminars.[16]

Still in 1975, there were hopes of retaining at least one field agent with the University of Delaware, but as the fiscal year 1975-76 neared its end and all remaining field agents had

found other positions, the incentive to push hard for one more year of field agent activities was gone. The lack of State support for this idea helped to seal its fate.

The agricultural extension idea, the philosophical godfather of the Del Mod field agent idea, had fared far better under a similar situation of terminated federal funds. The county agricultural agents in the Northern and Western States had so convincingly shown their importance and efficiency as factors in agricultural welfare and improvement that when the federal war emergency funds were taken away at the end of World War I, the counties generally retained these agents from their own funds, and many new counties established these agents.[17] This has not happened to Del Mod; and yet, Del Mod is the best thing that has happened to science education in Delaware. It would not be unreasonable to expect Delaware to continue the field agent component as a State function. It would be in the interests of school districts to exert pressure on the State to accomplish this. The only other alternative would have been for Del Mod to become self-supporting; but, as one field agent states, "it has been too good to have to do that."

Still, there is one small note of optimism for the continuation of the field agent concept. The University, totally on its own accord, has established an environmental field agent, who will work with only one school district and will use the materials and facilities of the Del Mod resource center in Sussex County. The agent will be appointed from among the University's graduate students and will serve for one year. It is certain to all involved that this position could not have been established without Del Mod. This slender continuation is not a Phoenix rising out of the ashes, but it does give a clear indication of the University's greater service orientation toward its surrounding community.

Del Mod was unquestionably a success in Delaware - but it lasted only as long as its funding. It is thus clear that the Del Mod idea can be successfully transported to another state or area only if there are ample funds available. Another important element for the start of such a complex project as the Del Mod System is a favorable political climate. Support and high-ranking state officials is essential. Both in Delaware and in a somewhat similar project in Oregon, the State Governors interacted with the Director of NSF already at an early stage in the development of those projects. The involvement of such high-ranking individuals give the projects considerable status and credibility, and resulted in increased attention and cooperation of all parties involved.

Time and time again, it has been recognized that Del Mod's major strengths are its field agents and its resource centers. These would then also have to be the most transportable

components in the Del Mod System. In recognition of their potential for transportation, each of these two components has been allocated one entire volume in Del Mod's Final Report. It is hoped that potential imitators and adapters will learn from Del Mod's successes and shortcomings.

The field agent idea per se has been a success throughout recorded history and in all types of sociological and geographical contexts. Del Mod applied these age-old insights to science education. Others may take Del Mod as a model for similar efforts in other disciplines, states and regions. The funding problem may be solved differently elsewhere - perhaps by having several school districts pool resources to hire a single field agent. Many Del Mod evaluators have felt that field agents could perform the most important aspects of their work without the aid of resource centers, and that field agents could operate successfully even if no resource centers were available.[18] Field agents were the basic building blocks of the Del Mod System and of organized science education in the State of Delaware. They can add strength to any state's educational facade.

FOOTNOTES FOR CHAPTER VII

[1]The Augmented Council of Presidents, State of Delaware. A Proposal for the Del Mod System (The Delaware Model: A Systems Approach to Science Education). Proposal to the National Science Foundation (Dover, DE: Del Mod System, February 24, 1971) p. 333.

[2]Alfred Charles True, A History of Agricultural Extension Work in the United States 1785-1923 (Washington, DC: U.S. Government Printing Office, 1928) p.3.

[3]Charlotte H. Purnell et al., The Status of Science Teaching in Delaware (Dover, DE: State Department of Public Instruction, June 1969).

[4]Alan Nowakowski, "The Traveling Observer Report on Del Mod," Del Mod System in Science Education. Report to the National Science Foundation, Project GW 7903 (Kalamazoo, MI: Western Michigan University, The Evaluation Center, June 1974) p. 103f.

[5]Minutes of the Component Coordinators' Meeting, October 6, 1972.

[6]John R. Bolig, Del Mod at a Glance, Volume III: 1973-74 Annual Report for the Del Mod System (Dover, DE: The Office of the Del Mod Component Coordinator for the State Department of Public Instruction, October 30, 1974) p.30.

[7]Ibid., p. 21.

[8]Carlton W. Knight III, interview held in Dover, DE, January 24, 1975.

[9]Idem.

[10]John F. Reiher, interview held in Dover, DE, May 15,1975

[11]Bolig, p. 30.

[12]The Augmented Council of Presidents, State of Delaware, A Proposal for Renewal of Grant No. GW 6703, The Del Mod System (The Delaware Model: A Systems Approach to Science Education) Proposal to the NSF (Dover, DE: Del Mod System, May 1, 1974) p. 29.

[13]Ibid., p. 17.

[14]Ibid., p. 15

[15]Ibid.

[16]Ibid., p. 26.

[17]True, p. 179.

[18]Donald W. Humphreys, Responsive Evaluation: Del Mod System. A Del Mod Document (April 1976) p. 8.

APPENDICES

APPENDIX I

SUMMARY OF DEL MOD'S FIELD AGENT PROJECTS

70-01 A Study of Field Agent Approach
Director: J. Reiher
Field Agent Project
N=65

This project, conducted during the academic year 1970-71, preceded the formal inception of Del Mod. One objective of this pilot project was to develop a prototype for Del Mod's field agent concept. All but a few of Kent and Sussex County science teachers participated in this project. They were divided into six groups and met one full day every other week for 15 weeks. The course consisted of mini-lessons from many of the newer science curricula, the use of micro-teaching, field trips, lectures, workshops and the development of teaching units. In addition, a training workshop was instituted for the substitute teachers who were assigned to cover the classes of the participants. The program details were developed by the field agent and the State science supervisor. The State science supervisor assumed responsibility for all arrangements with the schools.

Pre- and post-TOUS tests indicated that this field agent program seemed to have had no significant effect on the participants' attitudes. It does, however, seem evident that the participants have changed in their attitudes toward ordering textbooks and classroom supplies. From this initial venture several points emerged that served to guide future Del Mod field agent programs. Thus, it was found that cooperation will occur when teachers are given release time and the districts are provided with remuneration for substitutes. It was also found that effective group sessions must be small and that extensive use should be made of microteaching techniques and interaction analysis. Materials should be inexpensive, easily transported, and adaptable to most classroom situations. Field agents should alternate their pattern of presentation to avoid fatiguing their audience. To reinforce and insure implementation of the skills perfected in group sessions, follow-up activities are strongly recommended.

The National Science Foundation provided funds for the operational costs of this pilot program, and Du Pont supported the substitutes for teacher replacement.

71-05 Wilmington Middle School Science Teacher Project
Director: L. Clark
Field Agent Project
N=15

The objective of this project was to improve teaching strategies and to familiarize the participants with materials available for adaptation to the development of an inner-city middle school program. The field agent encouraged teachers to realistically appraise their students' ability levels and to design activities accordingly. The program involved all-day classroom visitations with each teacher (once a month) and Saturday meetings

with the entire group. Topics included a general orientation and instruction in the use of SAPA, ISCS, EES, and IPS curricular materials.

The participants noticeably increased activity-oriented lessons in their classrooms and incorporated in these lessons many activities presented during the Saturday sessions. The teachers have also tried to persuade their principals to order materials for an activity-oriented program. Principals and teachers suggested strongly that the once-a-week consulting practice be discontinued in favor of a part-time resident person who intimately knew the problems of the district and was available for call at any time.

71-07 Upper Elementary Project (Kent and Sussex Counties)
Director: J. Gussett
Field Agent Project
N=60

The participants were self-contained teachers of grades four, five, and six. The object of this project was to help teachers overcome their reluctance to teach science. The emphasis in this project was on the use of inquiry-centered techniques. Workshop activities were organized so that the agent worked with no more than fourteen teachers at a time. Individual classroom assistance was rendered when requested. The participants also took field trips and were shown instructional movies. The program was scheduled so as to minimize the amount of time the teacher would be removed from the classroom.

The participants were enthusiastic about the project and continued their participation even when neither release-time nor financial support were forthcoming. Mr. Gussett received over 250 individual requests for specific information on teaching materials, nature and content of science, resources, teaching techniques, etc. All participants expressed a desire to continue the project during 1972-73.

71-08 Eastern New Castle County Teacher Project
Director: B. Logan
Field Agent Program
N=60

The participants were science teachers of grades five through nine. The objective of the project was to improve teaching strategies. The participants were divided into groups of ten to twelve teachers and met on a biweekly basis for 14 weeks and as one large group on a regularly scheduled State inservice day. Each teacher was provided with a substitute who was trained and paid by Del Mod. Ms. Logan familiarized the participants with aspects of various curricula, demonstrated classroom teaching activities, and served as an all-around morale booster. She also devoted time to individual consultation and systematic classroom observation for diagnosis of teaching strategies. Each teacher was video-taped at least once and a viewing with the

Field Agent enabled the teacher to assess his teaching techniques from an objective vantage point.

The Field Agent observed a definite effort on the part of the teachers to incorporate more activity-oriented approaches in their classroom presentations. A change in ordering patterns toward more activity-centered materials was noted. Many commented on the benefit of the exchange of ideas among participants that took place during the group sessions. Perhaps the most obvious change observed was one of growing enthusiasm as the teachers and students began enjoying the purposeful activities attempted. Teacher-centered classrooms began to be transformed into student-centered, lab-oriented workshops.

72-02 Inventory and Program Assessment, Odessa and Townsend Elementary Schools
Director: A. Conaway
Field Agent Program
N=15

In this project, inservice teachers took complete inventory of available science materials at the Odessa and Townsend Elementary Schools in the Appoquinimink school district. The resulting inventory lists indicated the location of all items and the grade level for which they were suited. The lists enabled teachers to share and utilize more efficiently the science resources of their schools.

72-18 Upper Elementary School Field Agent Activities
Director: J. Gussett
Field Agent Project
N=59

This project for Kent County teachers and project 72-27 for Sussex County teachers were follow-up projects of Del Mod project 71-7. In addition to continued activities with the participants of project 71-7, Mr. Gussett also ran a program for fourth, fifth, and sixth grade teachers who had not participated the previous year. The general thrust of this program was to "sell science" to upper elementary teachers by introducing them to successful teaching techniques and familiarizing them with an inquiry-based science attitude. Mr. Gussett worked with small groups of participants and also rendered a considerable amount of individual assistance.

All participation in the inservice sessions was voluntary, and the large number of participants seems to be an indication of the popularity of this project. Unsolicited verbal feedback from these teachers confirms that they believe they are obtaining valuable aid in the teaching of science.

72-21 Study Based on TOUS Scores and 14-Scale Video Analysis
Director: B. Watt
Field Agent Project
N=26

Del Mod Research Director J. Bolig and Field Agent B. Watt undertook a research study to determine if any correlation could be derived between scores on the TOUS test and the input of student activity, recorded by the 14 category Instrument for Analysis of Science Teaching from the University of Texas. Interaction data were obtained from video tapes and live classroom episodes. The study found that student non-verbal activity was much more in evidence in the classes of teachers with high TOUS scores than in classes of teachers with low TOUS scores. It seems probable that teachers with greater knowledge of science, as measured by the TOUS, permit more latitude on the part of students. This would be a desirable characteristic in school districts which have adopted inquiry-oriented curricula.

72-23 Middle School Field Agent Activities (New Castle County)
Director: B. Logan
Field Agent/University of Delaware Project
N=25

In 1972-73, middle school teachers participated in 14 biweekly seminars during which they were systematically introduced to the newer curricula in science education, to the methodologies these curricula utilize, and to the research from which they developed. An effort was made to assist teachers in developing and improving specific performances. Teacher-constructed tests were examined and their degree of difficulty was rated with Bloom's Taxonomy as a criterion. Time was also devoted to instructional planning with an emphasis on the relationship between stated objectives, the activities suggested, and the evaluation items designed. In addition to completing a programmed unit, Constructing Instruction Based on Behavioral Objectives, each participant was asked to prepare a unit that could be used the next term. These units were critiques by Ms. Logan with special attention given to the statement of objectives, the appropriateness and performance agreement of the activities suggested, and the relevance of the assessment items. The eventual aim of this program is to offer teachers alternate paths for achieving their program goals, and to show the teacher how to develop a quality program with minimal materials.

A survey of teaching strategies (constructed by Dr. Robert Uffelman in 1972) was used as a pre- and post-self assessment. Teachers were asked to judge each performance item as being essential or non-essential to successful science teaching, and to appraise their own performance to meet requirements stated in the objectives. Post assessments in both cases showed appreciable gains. Also subjective evidence of the effect of the seminars was observed. One school invested in SCIS materials for

the next school year. Two schools dusted off retired SAPA materials and requested that their budget be spent to supply missing items. Materials were checked out of the Resource Center on a regular basis, indicating a tendency to include more student centered activities in the curriculum. Four schools, whose teachers were involved in the seminars, ordered ESS materials to supplement ongoing programs after having used these materials from the Resource Center.

72-27 Follow Up of Gussett's 1971-72 Field Agent Project
Director: J. Gussett
Field Agent Project
N=26

This project (for Sussex County teachers) and project 72-18 (for Kent County teachers) constitute a continuation of Del Mod project 71-7. For details about this program, see Del Mod project 71-7.

72-35 Elementary School Field Agent Activities
Director: A. Conaway
Field Agent Project
N=40

The objective of this project is to provide teachers in the lower grades with a science guideline which they can amend and adjust to their own concept of importance and needs. This project was offered to districts using the SAPA program as a vehicle for articulation. The teachers' feeling of inadequacy and lack of confidence in science made them resistant to new programs. SAPA presented an enigma to most of the participants, since most workshops had tended to put the teacher in the position of the student, but had neglected to prepare the teacher for the role of classroom manager. In many instances, the field agent had to spend considerable time untangling the disorder of abused SAPA kits, setting up a central storage system convenient for sharing, taking inventory of missing parts, and in a few cases just tracking down materials which had been stored away. The field agent demonstrated in the classroom materials borrowed from the Del Mod Resource Center. Teachers were amazed at how diversified science is and how it could be correlated with reading, arithmetic, etc.

These sessions inspired the teachers to expand the science program and to experiment with their own ideas and units. The field agent originated several local interest units which caused teacher enthusiasm. An EMR class became so interested in beach environment through a field agent unit on horseshoe crabs that a field trip was made to the beach to participate in The Sea Beside Us, an ESEA Title III program.

The field agent assistance was welcomed by the primary teachers since it relieved some of their concerns and fears about science.

The participants were informed of new programs and ideas and were kept in contact with resource centers. Many teachers stated that they had learned to enjoy teaching science.

72-36 Field Agent Video Taping Program
Director: B. Watt
Field Agent Project
N=40

The participating teachers had volunteered to undergo self-analysis through the use of video taping. The premise underlying this program was that by the use of video taping and interaction analysis, secondary teachers could become more aware of their teaching styles and techniques. This would serve to reinforce the desirable traits and serve as an agent to promote change in less desirable traits. Bruce Watt's monograph Your Verbal Portrait was the central theme of the playback conference. Following the objective analysis, a general discussion about the video tape was held. During the discussion positive reinforcement was emphasized.

Although teachers generally agree that video taping and analysis is a worthwhile enterprise after the fact is accomplished, the majority of teachers will refuse to volunteer in such a program when it is an end in itself. When videotaping is an integral part of an ongoing program and the teacher has confidence that the reviewer will not reveal the tape analysis to administrators, peers, or other unauthorized persons, it does work and is extremely effective.

72-39 Longitudinal Study of Several of Logan's Field Agent Participants
Director: B. Watt
Field Agent Project
N=11

The object of this research project was to determine whether Field Agent inservice programs effect changes in the teaching styles and techniques of the participating teachers. Fifty teachers were videotaped during the 1971-72 school year. These teachers participated in Field Agent B. Logan's inservice program during the spring of 1972. Eleven of these teachers were videotaped again following the inservice program. The teachers knew in advance the time and day the tapes were to be made, but were given no directions as to what they were expected to teach during the taping experience. Field Agent B. Watt analyzed the tapes using Flanders' ten-category system of interaction analysis. A computer program was utilized to expedite the analysis of data. Mr. Watt found the Flanders' analysis inadequate for recording interactions in a lab-oriented class. He arbitrarily decided to record class interaction as "lab activity" whenever the teacher's voice was not distinguishable. Using this operational definition it was found that the 11 teachers have their students involved in more lab activities this year than last. A somewhat surprising finding was that the use of student ideas and teacher

questions had decreased in a majority of cases in 1972-73 and that the amount of teacher lecturing had increased in nine out of eleven cases.

72-52 Follow Up of Project 71-8
Director: B. Logan
Field Agent Project
N=32

Field Agent Logan conducted follow-up activities with teachers who had participated in her 1971-72 seminars. The type of service requested by these teachers indicates the impact of the previous year's seminars. There were 18 requests for further video-taping experiences, nine requests for a critique of questioning techniques, and three requests from schools for assistance with curriculum change. There were also isolated requests for aid with the planning of specific activities, more utilitarian organization of equipment, and locating specific resources.

The single most common observation made was that of increased student activity. Most teachers had incorporated lessons involving their students in the manipulation of equipment and the collection of data.

73-06 Milford District Science Articulation
Directors: G. Moyer and J. Gussett
District/Field Agent Project
N=13

Funds were provided by Del Mod to pay for substitute teachers used to free regular classroom teachers during the school day. These teachers researched, designed, wrote, published and distributed a coordinated K-8 science program suggested for implementation in the Milford School District in September of 1974. Materials were also selected and purchased through this committee that were necessary for implementation. They were assisted in their efforts by Mr. James Gussett, Del Mod Field Agent.

Two curriculum guides for grades 1-5 and 4-8 on file in the Del Mod office indicate that Milford has responded to suggested State objectives and guidelines. The guides are sequential in nature so that teachers can anticipate future needs of children but within a given level are independent and minimal. These features should enable a teacher to take a flexible approach to the various units within each level similar to the ESS designed activities.

73-09 Science, Grades 2-4 - Appoquinimink School District
Director: Dennis Reilly, Del Mod Fellow
Field Agent/District Project
N=8

As a result of a teacher survey, a science/environmental education plan was proposed. Mr. Reilly assisted the teachers in a series of monthly meetings (a year's duration) with adaptation of the existing SAPA material in the district to the immediate

environment of the schools in the district. He gave in-the-field assistance on numerous occasions to individual teachers on the mechanics of such a move. In addition, several grade-level field trips were organized. The teachers were also given assistance in using SAPA environmental materials as a vehicle for stimulating interest in reading.

73-10 SAPA and Environmental Education - Alfred I. K-3
Director: D. Reilly
District/Field Agent Project
N=23

Curriculum development utilizing environmental education was developed in conjunction with SAPA. These materials were edited and distributed throughout the district. The conclusion of K-3/SAPA curriculum development has led to the examination of 4-6th grade materials. These will be revised in the 1974-75 school year.

73-12 Science Curriculum Study, Grades 5-12, Laurel District
Directors: D. Taylor and J. Gussett
District/Field Agent Project
N=9

A team of science and health teachers identified as a district need the desirability of integrating science courses with health education. A representative group met for one week during the summer with a Del Mod field agent to devise strategies for implementation. Considerable time was spent during the workshop on reconciliation of various philosophies held by participants. The resultant products were guidelines of reinforcement of some basic physiological processes and prevention of duplication of effort. Changes in staff assignment during the summer somewhat nullified the planned implementation. The agent continued to meet on a monthly basis with as many of the group as possible to lend assistance to the plan.

73-15 Sequential Skills in Science: New Castle-Gunning Bedford School District
Directors: B. Logan, P. Shannon, H. Wilson
District/Field Agent Project
N=11

During the one-week summer workshop, the participants attempted to identify areas of overlap in math and science. Cooperative teaching units were prepared and field tested during the school year. Units on graphing, measurement as applied in outdoor settings, and on radio were prepared.

The graphing unit was revised after use in the classroom. The length of the unit was shortened. The three units are on file in the Del Mod office. Several follow-up activities are scheduled during the 1974-75 school year to realign science-math objectives in the district.

73-17 Primary Science Workshop, K-4 Caesar Rodney District
Directors: D. Bolig and J. Gussett
District/Field Agent Project
N=41

A team of five teachers from the Caesar Rodney School District, each representing grades K-4, were trained by a Del Mod field agent in SAPA teaching procedures, materials and philosophy. These five teachers were responsible for training other teachers during the school year. Classes met twice a month for eight months, and each instructor conducted at least one class at the Resource Center in Georgetown.

Teacher comments at the conclusion of the school year reflect a greater awareness of the advantages and limitations of SAPA lessons and materials. Class size was frequently listed as a problem in the coordination of SAPA lessons.

73-18 Field Agent Activities (New Teachers)
Director: J. Gussett
Field Agent Project
N=54

The participants were Kent and Sussex County teachers who had not previously worked with a Del Mod field agent. Several objectives were agreed upon by the field agent and local district personnel. After SAPA had been adopted by the district, the field agent helped implement it and provided the teachers with the philosophical background for SAPA. Several math-science related activities were started.

Work with "new" teachers requires a great investment of field agent time and yields a moderate return of concrete results. Specific programs usually result only after a second year of field agent assistance.

73-19 Field Agent Activities - Follow Up of 1972-73
Director: J. Gussett
Field Agent Project
N=14

Follow up of teachers who had worked with Mr. Gussett in 1972-73 was on a first-come, first-served basis. A variety of activities resulted, including video taping, planning of field trips, implementation of SAPA lessons, and assessment of Seaford School District's curriculum guide. Several of the participants seemed to feel that the Del Mod field agent was to be used as a resource rather than as a facilitator in planning lessons. Mr. Gussett made a point of not doing the teachers' work for them, but instead encouraged and assisted them in trying new techniques on their own.

73-20 Field Agent Activities - New Teachers
Director: B. Logan
Field Agent/University of Delaware Project
N=18

Barbara Logan conducted seminars for teachers in New Castle County. Various science programs were examined and teaching strategies were surveyed. Participants prepared and presented in the seminars demonstrations of various strategies. Field Agent Logan is housed and the seminars were conducted at University of Delaware facilities.

These seminars provide an excellent opportunity for Del Mod Field Agents to establish initial contact with new teachers and to introduce them to the field agent concept. Follow up is planned for the 1974-75 school year.

73-22 Stanton School District - Science Articulation
Director: B. Logan
District/Field Agent Project
N=16

This project is the continuation of the 1971 articulation program. As the result of the consolidation of two districts the need existed for an articulated K-12 program. The task was originally assigned to the part-time Del Mod agent. Changes in administration resulted in the reassignment of the project to a full-time Del Mod field agent. The model was completed during the fall of 1972 and revised during the spring of 1973. In addition the group determined equipment needs for the implementation of the model. It was discovered that much of the material was on hand but needed reorganization, a task which the group proposed to do in the summer; in the interim the district purchased as much material on the recommended list as feasible.

73-25 SAPA Grades 3-4, Capital School District
Director: D. Reilly
District/Field Agent Project
N=11

The Del Mod field agent met with District personnel to plan a schedule and school-by-school evaluation of SAPA. Teachers and principals were presented with new approaches to SAPA and most schools had success with SAPA during the 1973-74 school year.

District commitment to SAPA was reflected in the acceptance of the program and of the field agent. No hard data are available to support the existence of this commitment, but the field agent has been asked to continue the program during the 1974-75 school year.

73-26 Science K-4, Marshallton-McKean District
Director: D. Reilly
District/Field Agent Project
N=29

All second and third grades in the District are using the SAPA curriculum. Fourth grades in all schools should be ready to fully implement this program in September. This was achieved by visiting each building principal and teacher involved in the program to determine needs. Follow up took the form of team meetings, work-release time, district grade-level meetings and individual classroom demonstration lessons where requested. Mote and Marshallton developed a centralized storage area while Marbrook used local classroom storage.

73-34 Math Field Agent - New Castle County
Director: P. Shannon
Field Agent Project
N=39

Mr. Shannon, who was new to Del Mod this year, worked in eight New Castle County school districts. His prime responsibility was follow-up activity with those teachers who had been involved in previous Del Mod math-lab courses. His activities included text selection, inservice programs, development of math labs, implementation of DMP materials, and an activity-oriented workshop. Most of the assistance was based on individual teachers' need and background.

Mr. Shannon felt that the multitude of school districts and activities prevented an adequate follow-up effort and placed a strain on his budget. To improve his program for next year, he started setting up firm commitments with a limited number of school districts. He also intends to establish a completely planned time table for the year in order to maximize the efficiency of his effort.

73-35 Math Field Agent - Kent and Sussex Counties
Director: R. Cowan
Field Agent Project
N=55

In 1973-74 mathematics became a full entity in the Del Mod System. Dr. Cowan, a newly hired math field agent, conducted three separate programs:

1. Individualized Junior High School Mathematics
2. Metric Goals and Objectives
3. Follow Up of Math Lab I

He acquainted teachers with new materials, developed classroom activities, and assisted with the development of a metric-oriented curriculum guide. Dr. Cowan visited and consulted with all participants in their own classrooms.

Since the math field agent was a new concept to Delaware teachers, Dr. [illegible]wan found that he had to take time to introduce districts to his skills and talents preparatory to a more thorough and specialized assistance for mathematics teachers in the concerned districts.

73-37 Science Project for Claymont Middle School
Directors: B. Logan and F. Gavas
District/Field Agent Project
N=5

An analysis of science program was conducted and the program was revamped to incorporate the Natural Science objectives for the fifth through eighth grades as set forth by the State Department of Public Instruction. The sixth grade teachers prepared sample evaluations related to the specific unit objectives. The seventh grade life science is developed on multi-text approach and the eighth grade segment includes suggested activities to accompany the specific objectives. These variations reflect an attempt to correct major areas of weakness in the former program.

Several meetings were held with the high school and elementary personnel to ensure smooth transition for the student from one level to another.

The product of this year of work entitled "Claymont Middle School Science Curriculum" is on file in the Del Mod office. In addition, the science department hopes to continue the work begun to include construction of assessment items based on the specific objectives and to construct or identify a means to evaluate teacher growth.

It is also anticipated that similar efforts to better define objectives at the fifth grade level will be made.

73-38 Science Curriculum Development for Mt. Pleasant Middle School
Directors: B. Logan, J. Rockwell, and S. Harrison
District/Field Agent Project
N=16

The participants met in monthly session to identify content and to construct objectives suitable for the fifth and eighth grade science course of studies. These sessions resulted in a manual stating the overall behavioral objectives, concepts and content suggested for fifth and eighth grades.

This complements the work done last year for the sixth and seventh grades and ensures complete stepwise coverage of the minimal objectives as suggested by the Department of Public Instruction.

During writing sessions scheduled for summer and early fall, suggested activities and listing of materials needed to implement the program will be prepared.

Copies of the "Mount Pleasant Intermediate School Science Curriculum Grade 8" are available in the Del Mod office. In addition, an on-site follow-up will be conducted next year to assist in the implementation of the units developed. This follow-up will include sessions on teaching techniques as well as in-classroom assistance.

73-41 Wilmington Science Intern
Director: M. Griffin
Field Agent Project
N=45

Mr. Griffin's responsibility as science intern was to coordinate science activities at the secondary school level. He found that teachers were either unaware of or were ignoring a science curriculum guide which had recently been published by the Wilmington School District. Mr. Griffin instituted regular curriculum meetings and got the teachers involved in the articulation of science curricula at each grade level and between grade levels. He also helped the teachers construct an inventory of equipment and materials needed in each school. The participants also discussed improvements in curricula materials with special emphasis on hands-on-laboratory experiences. Mr. Griffin worked toward an integration between science and other related skills. To that end he got science and math teachers to work together on related problems and arranged for a very successful workshop on the teaching of science-content reading skills.

As a result of this project, all teachers now possess the Wilmington Science Curriculum Guide and are conforming to objectives within the guide. Mr. Griffin also assisted with the writing of curriculum guides for courses which previously had no guides. The teachers have become highly motivated and feel that they have a chance to succeed in the classroom. At the end of this project, many teachers were even working on their own time during the summer preparing for their fall courses. It can be concluded that teachers will change attitudes and habits if they are shown that they can expect a measure of success in their classrooms.

73-54 Field Agent Follow-up Project
Director: B. Logan
Field Agent Project
N=22

This project offered supportive services to individual teachers who had worked with Ms. Logan during 1972-73. Classroom visitations were made throughout the year upon request of the individual teacher or groups of teachers. Classroom assistance requests centered on teaching strategies and on assistance with specific new activities. There were some requests for group sessions after school or during team prep periods. In these instances, other school personnel also were present.

75-18 Newark Science Workshop Series

Director: Barbara Logan
District/Field Agent Project
N=11

Teachers from Wilson School were involved in a variety of workshops dealing with specific science topics. All participants were cooperating teachers, with student teachers in their classrooms. The presence of the student teachers allowed the teachers to take release time during the school day for workshops; the student teachers were given time alone with a class as a result of the workshops.

The topics studied varied workshop-to-workshop and included units on plants, the human body, the metric system, and how to set up learning stations.

75-19 Outdoor Education Program, Sanford School

Director: Barbara Logan
Field Agent Project
N=10

The teachers at the Sanford School requested that the field agent teach them how to make use of the school's large wooded campus for outdoor science education. The first order of business was establishing objectives for an outdoor science program. Then, activities to meet those objectives which were feasible for the campus were designed. Finally, the field agent took the teachers on nature walks to teach them names of plants and trees and demonstrate nature walks appropriate for science students.

75-20 De La Warr Program for Gifted Children

Director: Barbara Logan
District/Field Agent Project
N=2

Ms. Logan worked with John Kinsler and Sam Wilson on a science program for gifted children. The program was planned, including objectives and activities. The field agent saw the project through implementation.

From this project an idea for a biking science trip developed. Mr. Kinsler and Ms. Logan planned the week-long trip to Cape Henlopen from De La Warr. Mr. Kinsler and two other teachers then biked to Lewes with 28 students during a very cold week in May.

75-21 Mount Pleasant Science Curriculum Implementation

Director: Barbara Logan
District/Field Agent Project
N=7

The purpose of this project was to implement the fifth grade curriculum designed in Del Mod Project 74-27. For more details, see Project 74-27.

75-22 Individual Teacher Assistance Program

Director: Barbara Logan
District/Field Agent Project
N=4

This program entailed intensive work with teachers in and out of the classroom on a variety of science topics. All the teachers were from the New Castle-Gunning Bedford District, but the field agent's contact with the teachers was on an individual periodic basis. Per special request, activities including microscope studies and surveying the school grounds were pursued.

75-23 Individual Math Teacher Programs, Channin School

Director: Peter Shannon
District/Field Agent Project
N=6

This project was an outgrowth of a meeting the field agent conducted with the teachers from Channin Elementary School in the Alfred I. du Pont District. The meeting was intended as an introduction to what a field agent is and what a mathematics field agent can do for a teacher.

As a result, Mr. Shannon worked closely with six of the teachers, in class and out. Specific problems and activities were pursued at the request of the respective teachers.

75-24 Claymont Curriculum Guide Workshop

Director: Peter Shannon
District/Field Agent Project
N=9

Mr. Shannon spent one hour with teachers from each grade in the Claymont School District discussing the use of the State Mathematics Curriculum Guide. This project involved extensive follow-up work with nine teachers from Darley Road, Green Street, and Pennsylvania Avenue Elementary Schools.

75-25 Wilson School Math Activities

Director: Peter Shannon
District/Field Agent Project
N=11

Eleven teachers from the Etta Wilson Elementary School met with the field agent to discuss math objectives and design appropriate activities for use in the classroom.

75-26 Individual Teacher Activities, Leasure Elementary School

Director: Peter Shannon
District/Field Agent Project
N=8

The work in this project was individually oriented. Mr. Shannon worked with these teachers extensively in and out of the classroom on mathematics teaching problems and activities.

APPENDIX II

DEL MOD SYSTEM: FISCAL, DESCRIPTIVE, AND EVALUATIVE REPORTING OF DEL MOD PROJECTS

NEW PROJECTS AND/OR CONTINUING PROJECTS

Preliminary budgets for any new of continuing projects to be included in the Del Mod proposal for the following fiscal year must be in the Del Mod Director's office no later than October 15 for presentation to the Augmented Council of Presidents at its October meeting. Prior to this time projects should be reviewed by the component coordinator and the institution. After institutional approval, all projects will then be forwarded by the component coordinator to the Del Mod Director. The Executive Committee with advisement by the component coordinator will in turn screen all new and continuing projects to determine if they meet the previously established priorities of the Del Mod System. Their recommendations will be sent to the Augmented Council of Presidents together with the projects.

New Projects, in addition to a preliminary budget, must have by October 15 a complete detailed narrative of proposed activities. The narrative should include:

1. Objectives of proposed project in behavioral terms
2. Target population as fitting the priorities of the Del Mod System
3. Brief summary of proposed activities highlighting any new of special features
4. PERT Chart of activities
5. Evaluation design
6. Leverage, including any additional sources of support and letters of commitment from cooperating schools if applicable
7. Efficiency, as part of assessing input of project on improving quality of education without increasing cost and/or reducing costs of education
8. Systemization as it leads to the establishment or enhancement of a mutually reinforcing relationship between the Del Mod System and the local schools
9. Residual impact indicating how activity will be supported or phased into normal operation after support is terminated
10. Any changes which might arise or be necessitated for preservice education if applicable

11. Budget relating to activities with all funding sources shown

All efforts should be made to limit the dialogue on all points with special limits of a few brief paragraphs for Item 6 through 10.

Continuing projects should (on October 15) include the proposed budget with a brief budget explanation.

As soon as all budgets are approved by the Augmented Council, the preliminary budget of both new and continuing projects will be forwarded to the funding agencies.

Should it be necessary to negotiate the budget of any project, a meeting will be set up with officials of the funding agencies, the component coordinator of the institution involved, the Del Mod Director, and the project director. Following this meeting, revised budgets will be forwarded by the Del Mod Director to the Augmented Council for approval. If it is necessary after the budget-negotiation meeting for further discussion on specific items, such discussion may take place between the individual project director and the funding agency with the project director informing the component coordinator and the Del Mod Director of the final outcome.

By November 15, any revisions necessary in the narrative of a new proposal must be in the Del Mod Director's office. The narrative portion of continuing proposals must also be in the Del Mod Director's office by November 15 following institutional review. This narrative should include the same format as outlined for new proposals with the addition of a brief history of activities and accomplishments of the project and any pertinent pages of the original project which may be needed for clarification of proposed activities. Again, emphasis is on brevity with all points stated concisely.

All proposals will be forwarded to the Del Mod Director's office by the component coordinator. The Del Mod Director will in turn present all proposals to the Augmented Council for approval at the next meeting after November 15.

The final draft of the Del Mod proposal will be presented to the Augmented Council at its January meeting for signatures and forwarded to the funding agencies by February 1.

NARRATIVE REPORTS

Each project director will submit to the component coordinator a brief interim report of project activities by January 15. This will be forwarded to the Del Mod Director for compilation and distribution to appropriate parties by February 1.

The final report of the activities of the project for the current fiscal year will be transmitted to the component coordinator by each project director by June 1.

This report should include:

1. Brief description of activities
2. How each objective was satisfied
3. Names of participants and their schools
4. Results of evaluation activities
5. Project director's comments
6. Any materials resulting

Project directors' reports will be summarized by the component coordinators into an institutional report of Del Mod activities and submitted to the Del Mod Director by July 1 together with two copies of each project director's report.

The Del Mod Director will compile all institutional reports of the component coordinators plus the Director's report into a printed annual report for distribution by August 15.