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FINAL - EVALUATIVE REPORT  
PROGRAM FOR ADVANCED STUDY  
IN PUBLIC SCIENCE POLICY  
AND ADMINISTRATION  
UNIVERSITY OF NEW MEXICO  
JUNE, 1976

(NASA-CR-148831) PROGRAM FOR ADVANCED STUDY  
IN PUBLIC SCIENCE POLICY AND ADMINISTRATION  
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THE UNIVERSITY OF NEW MEXICO

DATE: June 17, 1976

TO: Mr. J. D. Morris, Chief, Management and Administration Research Branch,  
Office of University Affairs

FROM: Albert H. Rosenthal, Director, Program for Advanced Study in Public  
Science Policy and Administration, University of New Mexico

SUBJECT: NASA Grant - NGL 32-004-042

In response to your letter of June 8, 1976, following is a summary Final Report and Evaluation of the Program for Advanced Study in Public Science Policy and Administration established in 1968 as a result of the National Aeronautics and Space Administration Grant NGL 32-004-042. The enclosed Report is organized under the following headings.

Initiation of Program  
Premises of the Program  
Accomplishments of the Program  
Regional Advisory Committee  
Fellows in the Program  
Validation of the Program  
Conclusions and Recommendations

As indicated in the Report, the Program has completed seven years of operation with participation by eighty-three Fellows. We are currently arranging for the participation of the eighth group of Fellows from federal, state and local agencies.

Since the interdisciplinary nature of this type of Program is imperative for its effectiveness and some financial support is required to stimulate and maintain interrelated courses in most Universities, it is hoped that the National Aeronautics and Space Administration may obtain financial resources to re-undertake a program of modest University support in this significant field.

FINAL REPORT

IMPACT OF NASA GRANT NGL-32-044-042

PROGRAM FOR ADVANCED STUDY  
IN PUBLIC SCIENCE POLICY AND ADMINISTRATION

June, 1976

Albert H. Rosenthal, Ph.D

Director and Professor



FINAL REPORT

IMPACT OF NASA GRANT NGL-32-044-042

PROGRAM FOR ADVANCED STUDY IN PUBLIC SCIENCE POLICY AND ADMINISTRATION

June, 1976

Initiation of Program

Grant NGL-32-044-042 to the University of New Mexico was approved on February 14, 1968. The University announced the Program, both by the issuance of a small pamphlet entitled "Program for Advanced Study in Public Science Policy and Administration" issued on April 30, 1968, and by newspaper and other media releases. (Enclosure 1)

Semiannual reports were submitted to the Washington office of NASA for each of the years in which the grant funds were made available - from September, 1968 through July, 1973. The specific details concerning the actions taken, faculty, Fellows participating and curriculum are available in these Reports.

Since 1973, the Program has been conducted on a self-sustaining basis with each participating agency paying a fee to the University covering the costs of tuition, books and related expenses for this enriched program.

Premises of the Program

The basic purposes and premises upon which the Program has been established are as follows:

(1) There is a need for a university program, at an advanced level, particularly designed to prepare highly qualified students for future appointment to posts at the higher levels in public and public-private Science-Administration agencies;

(2) That the determination of the nature, extent, selection of participants, and academic approach and curriculum can be more realistically and effectively formulated on the basis of the counsel of present leadership in Science-Administration agencies and that this consultative approach to design the University

program should be undertaken as the major effort during the first year;

(3) Several methods for consultation should be undertaken including:

(a) the establishment of a Regional Advisory Committee composed of the heads of Science-Administration agencies located in the vicinity of the University;

(b) by the commissioning of a number of "study papers", on each of the several aspects of the undertaking, to be prepared by the best qualified people available to develop and present the findings on each subject; and (c) by the preparation of a series of case studies illustrating the actual day-to-day programs of Science-Administration and bringing out the factors involved in decision-making and other top-level activities in this field. Both the completed "study papers" and the series of case studies will be published in a form facilitating their use in the actual courses developed in the University for this program;

(4) That the academic approach for preparation for future leadership in Science-Administration calls for an interdisciplinary and problem-oriented approach bringing together the academic areas of Political Science, Business Administration, Economics, Psychology, Sociology, and other fields as they provide knowledge, concepts, methodology and approaches applicable to this field;

(5) That the level of academic work required is at the advanced graduate level designed to attract students who have already received a graduate degree in one of the related fields and are seeking to supplement this specialized knowledge with additional advanced education focused on specific preparation for responsibilities in Public Science Policy and Administration; and

(6) That the University commitment of interest, attention, and support will be exercised at the highest levels of the University in the development and administration of this program.

Accomplishments of the Program

Review of the ongoing and established Program indicates that these premises were soundly conceived and have been quite precisely followed in the establishment and conduct of the Program.

To provide for a graduate interdisciplinary curriculum, leading to a Master of Arts degree, it was necessary to establish an organizational base at the University for this purpose. Consequently, a Division of Public Administration was established at the graduate level to serve as the organizational location with degree granting authority for the Program.

Regional Advisory Committee

To insure that the Program continued to serve the needs of federal, state and local science agencies in the preparation of both pre and in service students, a Regional Advisory Committee consisting of seventeen agency heads and deputies was established. As of the present date, seventeen meetings of the Regional Advisory Committee and one National Conference on Public Science Policy and Administration have been held. (Enclosure 2)

Following is a list of the dates and major speakers who addressed the Fellows and members of the Advisory Committee at the semiannual meetings.

July 17, 1968

Mr. Wesley Hjernevik, Associate Director, Manned  
Spacecraft Center, NASA, Houston

Dr. Lloyd Musolf, Professor, University of California  
at Davis

Dr. Lynton K. Caldwell, Professor, Indiana University

November 7, 1968

Mr. Harold H. Leich, Chief, Policy Development Division,  
U.S. Civil Service Commission

Dr. Lynton K. Caldwell, Professor, Indiana University

Mr. Wesley Hjernevik, Associate Director, Manned  
Spacecraft Center, NASA, Houston

Dr. Dwight Waldo, Albert Schweitzer Professor, Syracuse  
University

February 13, 1969

Dr. C. West Churchman, Professor and Research Philosopher,  
Space Sciences Laboratory, University of California

Dr. George Kozmetsky, Dean, College of Business Administration,  
University of Texas

May 15, 1969

Dr. Rensis Likert, Director, Institute of Social Research,  
University of Michigan

Mr. Elmer B. Staats, Comptroller-General of the United States,  
Washington, D.C.

Dr. Harold Orlans, Brookings Institution, Washington, D.C.

February 26, 1970

Dr. William D. McElroy, Director, The National Science  
Foundation

May 29, 1970

Dr. Stephen K. Bailey, Chairman of the Policy Institute,  
Syracuse University Research Corporation, and Maxwell  
Professor of Political Science

Mr. Frank B. Smith, Assistant Administrator, National  
Aeronautics and Space Administration, Washington, D.C.

September 17, 1970

Dr. Walter Orr Roberts, President, University Corporation  
for Atmospheric Research, Boulder, Colorado

February 25, 1971

Dr. Frederick P. Thieme, President, University of Colorado,  
Boulder, Colorado

September 24, 1971

Mr. Harold B. Finger, Assistant Secretary for Research and  
Technology, The U.S. Department of Housing and Urban  
Development, Washington, D.C.

February 28, 1972

Dr. D. D. Wyatt, Assistant Administrator for Policy and University Affairs, National Aeronautics and Space Administration, Washington, D.C.

December 21, 1972

Dr. M. Frank Hersman, Director, Office of Intergovernmental Science and Research Utilization, National Science Foundation, Washington, D.C.

Mr. Frank C. Diluzio, Science Advisor to the Governor

May 4, 1973

Dr. Thomas B. Owen, Assistant Director, National Science Foundation

Dr. David S. Heesch, Director, National Radio Astronomy Observatory

February 1, 1974

Mr. William D. Carey, Vice-President, Arthur D. Little, Inc., Washington, D.C.

September 27, 1974

Dr. C. West Churchman, University of California, Berkeley

Mr. Frank DiLuzio, Science Advisor to the Governor

May 9, 1975

Dr. Louis Rosen, Director, Los Alamos Meson Physics Facility

October 8, 1975

Dr. Robert C. Seamans, Jr., Administrator, U.S. Energy Research and Development Administration

April 30, 1976

Dr. C. West Churchman, Professor and Research Philosopher, University of California, Berkeley

The National Conference was held on September 8 and 9, 1969 with the following speakers.

Mr. Wesley Hjernevik, Associate Director, Manned Spacecraft Center, NASA, Houston

Mr. James I. McCraw, Deputy Manager, Albuquerque Operations, Atomic Energy Commission

Mr. Harold H. Leich, Chief, Policy Development Division,  
U.S. Civil Service Commission

Col. George T. Buck, Commander, Air Force Missile Development  
Center, Holloman

Dr. George Graham, Executive Director, National Academy of  
Public Administration

Dr. C. West Churchman, Professor, Space Sciences Laboratory,  
University of California

Fellows in the Program

To the present date, 83 Fellows have participated in the Program.  
Following is a listing which gives the agency and names for each year of  
the program.

NINETEEN SIXTY-NINE - NINETEEN SEVENTY

In-Service Fellows

City of Albuquerque, New Mexico

Jose B. R. Anglada, Acting Air Management Engineer,  
Department of Environmental Health

National Aeronautics and Space Administration, Houston

Robert V. Battey, Aerospace Engineer, Manned Spacecraft  
Center

Charles A. Buckel, Chief, Security, Manned Spacecraft Center

Larry G. Damewood, Section Head, Contracts Division, Manned  
Spacecraft Center

Leslie J. Sullivan, Assistant Chief, Program Management,  
Manned Spacecraft Center

Richard E. Uhrmann, Chief, Personnel Management Asst. Branch,  
Kennedy Space Center

Atomic Energy Commission, Albuquerque Operations

Vladimir V. Berniklau, Development Engineer

Kirtland Air Force Base - U.S. Air Force

James E. Bickel, Project Engineer, Air Force Weapons Laboratory

Robert B. Bunker, Technical Advisor, Survivability Division,  
Air Force Special Weapons Center

Balthazar E. Martinez, Programs Engineer, Air Force Special  
Weapons Center



Paul A. Zielie, Project Officer, Air Force weapons Laboratory

White Sands Missile Range

Juanito V. Carrillo, Chief, Quality Control Office

Will E. DeBusk, Missile Engineer

U.S. Bureau of Mines, Washington, D.C.

Larry M. Lane, Assistant Chief, Division of Personnel

Sandia Base

James S. Patterson, Chief, Production Control, Defense  
Atomic Support Agency

Pre-Service Fellows

Maureen J. Roesch Baca, University of New Mexico Graduate Student

Roger W. Banks, University of New Mexico Graduate Student

NINETEEN SEVENTY - NINETEEN SEVENTY-ONE

In-Service Fellows

Kirtland Air Force Base - U.S. Air Force

Leonard M. Contreras, Systems Analyst, Air Force Weapons  
Laboratory

Nicholas Dienes, Project Officer, USAF Weapons Laboratory

Frank E. Seusy, General Engineer, Air Force Weapons Laboratory

Atomic Energy Commission, Albuquerque Operations

Jack R. Cotton, Chief, Special Projects Branch, Space  
and Special Program Division

Sandia Base

John R. D'Antonio, Chief, Master Plan Section, Defense  
Atomic Support Agency

Employment Security Commission of New Mexico, State of New  
Mexico, Albuquerque

Paul T. Davidson, Chief of Personnel Management

Office of Economic Opportunity, Washington, D.C.

David Farrell, Acting Director of Finance Division

White Sands Missile Range

Herbert I. Ferguson, Jr., Physical Scientist, U.S. Army

Naval Weapons Center, China Lake

William R. Hattabaugh, Head, Product Design Division

AF Unit Post Office, Los Angeles - U.S. Air Force

David W. Jackson, Aerospace Engineer, Air Force Contract  
Management Division

City of Albuquerque

William H. Otto, Assistant Water Engineer, Department of  
Public Works

National Aeronautics and Space Administration, Houston

Robert J. Ward, Aerospace Engineer, Flight Mission Operations,  
Manned Spacecraft Center, NASA, Houston

Pre-Service

Chitturi V. Raghavulu, Andhra University, India

Mohammad Shafi, Department of Physics, University of New Mexico

Louis Vincent Yegge, Jr., Bureau of Business Research,  
University of New Mexico

NINETEEN SEVENTY-ONE - NINETEEN SEVENTY-TWO

In-Service Fellows

Wright-Patterson Air Force Base, Ohio - U.S. Air Force

Thomas E. Bahan, Chief, Special Projects Division,  
Aeronautical Systems Division

White Sands Missile Range, New Mexico

Jack A. Dage, Missile Engineer, Department of the Army

Atomic Energy Commission, Albuquerque, New Mexico

David M. Davies, Security Assistant, Albuquerque  
Operations Office

Marshall Space Flight Center, Huntsville, Alabama, NASA

William Fortenberry, Chief, Data Center Division,  
Computation Laboratory

Kirtland Air Force Base, New Mexico - U. S. Air Force

Hugo Hofstadler, Chief, Plans Function, Air Force Special  
Weapons Center

Charles O'Haver, Program Manager

Carol Yarnall, Captain, U.S. Air Force

Sandia Base

Robert F. Lehr, Mechanical Engineer (Ordnance), Field  
Command, DASA

Wendell Vaughn, Lieutenant Commander, U.S. Navy, Field  
Command, DASA

New Mexico Transportation Department, Santa Fe, New Mexico

Jerry Ray Manzagol, Deputy Commissioner

New Mexico Oil and Gas Accounting Commission, Santa Fe, New Mexico

Antonio L. Martinez, Executive Director

Pre-Service Fellows

Don Anderson, Health Inspector, City of Albuquerque, New Mexico

Barbara Rose Hewins, Urban Affairs Student, University of  
Wisconsin, Milwaukee, Wisconsin

George Metarelis, Administrator, Indian Policy Academy, Roswell,  
New Mexico

Larry O'Dell, Analyst, Middle Rio Grande Council of Governments,  
Albuquerque, New Mexico

Robert Surran, Student, NMSU (Police Science), Las Cruces, New Mexico

Bruce Weydemeyer, Recent Graduate, Montana State University,  
Bozeman, Montana

NINETEEN SEVENTY-TWO - NINETEEN SEVENTY-THREE

Albuquerque Police Department, City of Albuquerque

Robert G. Baca, Police Sergeant

Vincent Villanueva, Detective

Wright-Patterson Air Force Base, Ohio - U. S. Air Force

Charles Ferguson, F-15 SPO Chief, Financial Control, U.S. Air  
Force, Aeronautical Systems Division

James H. Jolley, Electronic Engineer, Aeronautical Systems  
Division, U.S. Air Force

Atomic Energy Commission

Richard Glover, Materials and Test Engineer

Ronald Hauber, Program Development Specialist

U.S. Department of the Interior, Denver, Colorado

Nelson Kverno, Bureau of Sport Fisheries and Wildlife

U.S. Air Force, Albuquerque, New Mexico

William S. Lankford, Chief, 360/20 Computer Operations

New Mexico Oil and Gas Accounting Commission, Santa Fe, New Mexico

Jose G. Romero, Accounting and Systems Coordinator

Patrick Air Force Base, Florida - U.S. Air Force

Raymond Scheen, Electronics Engineer, U.S. Air Force

NINETEEN SEVENTY-THREE - NINETEEN SEVENTY-FOUR

New Mexico Health & Social Services Department, Santa Fe, New Mexico

Richard W. Cole

Edward L. Kaufman

Wright-Patterson Air Force Base, Ohio - U.S. Air Force

Joseph J. Lusczek, Jr., Aeronautical Systems Division

Michael H. Nock, Aeronautical Systems Division

William H. Toliver, Sr., Aeronautical Systems Division

Atomic Energy Commission, Albuquerque, New Mexico

Porter Grace

U.S. Bureau of Sport Fisheries and Wildlife, Washington, D.C.

Frank B. McGilvrey

National Aeronautics and Space Administration, Houston, Texas

Jose R. Perez, Johnson Space Center

NINETEEN SEVENTY-FOUR - NINETEEN SEVENTY-FIVE

New Mexico Health and Social Services Department, Santa Fe, New Mexico

Michael Ammann

Wright-Patterson Air Force Base, Ohio - U.S. Air Force

William B. Bentley, Department of the Air Force

Bobby F. Jones, Department of the Air Force

Department of Agriculture, Washington, D.C.

Edward F. Dalton

New Mexico Health and Social Services Department, Santa Fe, New Mexico

Joseph T. Engelken

New Mexico Environmental Improvement Agency, Santa Fe, New Mexico

Edward Kaufman

U.S. Fish and Wildlife Service, Washington, D.C.

John R. Lyons

Atomic Energy Commission, Albuquerque, New Mexico

Michael Peck

NINETEEN SEVENTY-FIVE - NINETEEN SEVENTY-SIX

National Aeronautics and Space Administration, Houston, Texas

Paul E. Brandenberger

Karen Kay Clark

Holloman Air Force Base, New Mexico - U.S. Air Force

Joe E. Coulter, Department of the Air Force

Energy Research and Development Administration, Albuquerque, New Mexico

Janell G. Crego

New Mexico State Planning Office, Santa Fe, New Mexico

Alfonso J. Lobato

New Mexico State Parks and Recreation, Santa Fe, New Mexico

Emilio I. Martinez

New Mexico Department of Health and Social Services, Santa Fe, New Mexico

Beverly Ann Rainwater

City of Albuquerque, Albuquerque, New Mexico

George I. Williams

Validation of the Program

There are three main ways by which a program of this type can be evaluated by objective means. These are:

- (1) The evaluation by participating agencies;
- (2) The career results and evaluation by former Fellows; and
- (3) Professional evaluation - the reaction of professional leaders in the field of Science Policy and Administration and the heads of programs in this field.

A significant test of the evaluation by participating agencies is presented by the fact that, since the expiration of the NASA grant, agency heads have been willing to sponsor participants by the payment of a \$2,500 fee for each participant. This is particularly significant in a period of tight budget restrictions and in the light of agency payments, in addition to this fee, of usually continuing the salary, and, in some cases, per diem for participants from their staff. In addition, numerous letters and comments from agency sponsors at meetings of the Regional Advisory Committee have attested to the value agency heads place upon this Program as a means of preparing members of their staff for more responsible positions.

A second "pulse beat" for measuring the effectiveness of this type of program lies in an examination of the career patterns and participant evaluation concerning the effect this Program has had on the career development and advancement of the former Fellows. In June, 1975, a former participant in



the Program and a graduate of the Public Administration Program jointly undertook a questionnaire of the graduates of the Program over a five year period. The findings of this study are reported in a published booklet by Vladimir V. Berniklau and Charles E. Spath entitled Science Administration Leadership for Tomorrow. (Enclosure 3) The report concludes with the final statement:

"....it is clear that the Program has been soundly established and is continuing to meet its stated objectives. This is further shown by a review of the research projects completed and used as theses by the Fellows. The interdisciplinary nature of the Program has been instrumental in the current accomplishments of the Program. The University now has the obligation to continue nurturing and improving the Program, thus assuring that it meets the needs of tomorrow." (Page 8)

On pages 8 - 14 of the report of the survey, the authors list specific findings from the questionnaire including the titles of the research projects of each of the Fellows. Among the findings indicated in the table are the following:

"33 or 87% of the respondents indicate that participation in the Program has substantially broadened their knowledge and management skills and abilities."

"53% of the respondents indicated that participation in the Program has definitely aided their career development."

"10 or 26% of the respondents indicate that while the Program was personally rewarding, it has not yet enhanced their career."

"34 or 89% of the respondents indicated that they would recommend the Program to qualified members of their staff or colleagues."

A third method of evaluating a program of this type is provided by the views of professional leaders in this field. In November, 1973, the Committee on Science Policy and Administration of the National Association of Schools of Public Affairs and Administration published a booklet entitled Science Leadership for Tomorrow. (Enclosure 4) In one chapter of this study,

Dr. Frank Marini, formerly Director of Public Administration Programs and Associate Dean of the Maxwell School, Syracuse University, and presently Dean, College of Arts and Letters, San Diego State University, selected the University of New Mexico program as what he termed "Model B" as a guide to other universities considering the establishment of a program with similar purposes. In evaluating the Program, Dr. Marini wrote:

"These years of operation have provided clear evidence of the need for this type of Program. The participation by agencies which, even during tight budget years, have found it possible to send participants to the Program at the cost of full salary and, in some cases additional expenses, provides testimony of the usefulness of the Program. The active participation of members of the Regional Advisory Committee and their enthusiastic support of the Program further testifies to the need and importance of this type of educational activity.

"The interdisciplinary nature of the Program is—as is true with most Schools and Programs of Public Affairs—one of its strongest points. The provision of courses cutting across department and school lines affords a much closer 'match' to the real-life needs of the government agency at federal, state, and local levels. Since most of the participants come with advanced degrees and expertise in one of the fields of science or technology, the interdisciplinary program affords supplement to their education in the Social Science and Administrative areas.

"Since the Program seeks to prepare people for top posts in the future, the value of advanced graduate courses in the Program is evident. Most of the participants are selected by their agencies on the basis of evident ability and performance on the job in their technical and professional fields. The 'track record' indicates that most employees are advanced to higher, more responsible positions following the successful completion of the Program.

"The evaluative feedback from former Fellows, their supervisors and agencies, has been particularly helpful. The close and continuous link of the Program with its 'clientele' and relevant agencies is among its strongest points.

"This, then, is an educational Program focusing specifically upon the advanced educational needs of those who are already in roles in Public Science Policy and Administration agencies."

Mr. H. Clyde Reeves, Council of State Governments, also commended the University of New Mexico Science Policy and Administration Program, particularly for meeting the needs of state agencies. In the NASPAA Report, Mr. Reeves writes:

"Similarly here, the concept of adding to the capacities of university programs in public administration and public affairs in the field of public science policy and administration affords a logical means of meeting state government needs in this area. As indicated in the models outlined above in Professor Marini's paper, several types of existing programs exist in universities throughout the country. While diversity may be useful in a number of areas, Model B, (the University of New Mexico program,) providing a graduate interdisciplinary course for both pre-service and in-service students and affording ongoing research capacities, appears to meet the needs in most state as well as federal and local agencies."

Another measure of professional interest in the Program is found in the fact that more than one hundred letters and calls have been received by other Universities requesting information concerning the Program. The Director of the Program has been asked to give papers describing the University of New Mexico Program at almost every National Conference of the American Society for Public Administration and several of the ASPA Regional Conferences. At the last meeting of the American Society for Public Administration held in Washington, D.C. on April 20, 1976, the Director of the Program gave a paper entitled "Education for the 21st Century: The Technological Ingredient - Filling the Gap - The University Role in Preparing Managers in Public Science and Technology Agencies" describing the Program. (Enclosure 5)

#### Conclusions and Recommendations

In summary, it appears clear that the Program for Advanced Study in Public Science Policy and Administration was established precisely upon the premises stated early in the development of the Program and in the opening of this report. The book, Public Science Policy and Administration, published in 1973 is currently being widely used and represents a further contribution as a result of the NASA grant.

The eighth group of Fellows is presently in the process of being nominated by participating agencies. At the present time, it appears that participants in the Program for the ensuing academic year of 1976-77 will be sent by the following agencies.

U.S. Air Force - Two

National Administration and Science Administration - One

U.S. Fish and Wildlife Service - One

Energy Research and Development Administration - Two

The State of New Mexico - Three

The City of Albuquerque - One

In addition to the eighty-three previous participants in the Program, it is hoped that in future years, additional staff members of federal, state and local agencies will be given the opportunity at the University of New Mexico and at other Universities to equip themselves better to make a contribution in this significant field.

Based upon the effectiveness of the pilot program established at the University of New Mexico in meeting its stated goals, the following recommendations are offered:

- (1) That the National Aeronautics and Space Administration seek to obtain funding for the Office of University Affairs so that a second phase of support may be provided to stimulate the establishment of new University programs in the field of Science Policy and Administration;

and,

- (2) That modest grants of some \$10,000 to \$20,000 per year be made available to insure the continuation of existing programs.

The need for supervisory and management personnel in Public Science agencies at the federal, state and local levels is increasing and will clearly continue to expand. It is important that a major federal agency such as the National Aeronautics and Space Administration provide assistance in meeting this need.

## APPENDIX OF ENCLOSURES

1. Pamphlet Describing the Program - "Program for Advanced Study in Public Science Policy and Administration"
2. Programs for the Sixteenth and Seventeenth Regional Conferences for the Meetings of the Regional Advisory Committee. The Committee members are listed on the back of each program.
3. Science Administration Leadership for Tomorrow by Vladimir V. Berniklau and Charles E. Spath
4. Science Leadership for Tomorrow - Report of the NASPAA Committee on Science Policy and Administration
5. Paper Presented at the National Conference on Public Administration in Washington, D.C. on April 20, 1976 - "Education for the 21st Century: The Technological Ingredient - Filling the Gap - The University Role in Preparing Managers in Public Science and Technology Agencies"



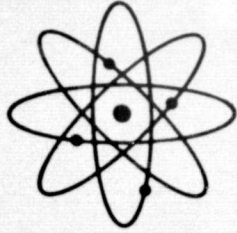


PROGRAM  
FOR advanced study  
in  
PUBLIC SCIENCE POLICY  
AND ADMINISTRATION



DIVISION OF PUBLIC ADMINISTRATION  
THE UNIVERSITY OF NEW MEXICO





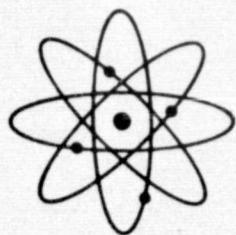
The University of New Mexico  
Program for Advanced Study  
in  
Public Science Policy and Administration

# 16th Regional Conference

October 8, 1975

Cavalier Room  
Four Seasons Motor Inn  
10:00 A.M.






The University of New Mexico  
Program for Advanced Study  
in  
Public Science Policy and Administration

# 17th Regional Conference

April 30, 1976

Cavalier Room  
Four Seasons Motor Inn  
10:00 A.M.





# Science Administration Leadership For Tomorrow

Vladimir V. Berniklau  
Charles E. Spath

A FIVE YEAR REVIEW AND ANALYSIS OF THE PROGRAM FOR  
ADVANCED STUDY IN PUBLIC SCIENCE POLICY AND ADMINISTRATION  
AT THE UNIVERSITY OF NEW MEXICO

# Science Leadership for Tomorrow

The Role of Schools of  
Public Affairs and Universities  
in Meeting Needs of  
Public Science Agencies

Albert H. Rosenthal

Robert F. Wilcox

Frank Marini

Report of the NASPAA Committee  
on Science Policy and Administration  
With Support From  
The National Science Foundation

November, 1973

NATIONAL CONFERENCE ON PUBLIC ADMINISTRATION  
Sheraton Park Hotel  
Washington D. C.  
Tuesday, April 20, 1976, 2:15-4:30 p.m.

Education for the 21st Century: The Technological Ingredient

"Filling the Gap - The University Role in Preparing Managers  
in Public Science and Technology Agencies"

Dr. Albert H. Rosenthal  
Division of Public Administration  
University of New Mexico

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NATIONAL CONFERENCE ON PUBLIC ADMINISTRATION  
Sheraton Park Hotel  
Washington D. C.  
Tuesday, April 20, 1976, 2:15-4:00 p.m.

Education for the 21st Century: The Technological Ingredient

"Filling the Gap - The University Role in Preparing Managers  
in Public Science and Technology Agencies"

The title of this paper may be interpreted in two quite different ways. First, it could mean that we would discuss the desirability, needs and methods of adding a capacity in science and technology to people in management positions in science agencies. However, we find that most people in leadership posts in these agencies have come up the scientific and technological ladders and have a great deal of knowledge about the scientific and engineering aspects of their work.<sup>1</sup>

The second interpretation of this title would emphasize the word "Managers" and would read "the university role in preparing managers in public science and technology areas." This is "the gap" in the education process to which I suggest we turn our attention today.

I have been asked to present what might be considered a case study in a joint public science agency-university effort to meet this need in the educational process of preparing science managers. I plan to present this case under four headings. These are:

- I. Development of the Program
- II. Curriculum
- III. Evaluation
- IV. Prospects for the Future

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<sup>1</sup>Cf. Study by Oganovic and Leich, "Human Resource for Science Administration" in Albert H. Rosenthal, Public Science Policy and Administration, Chapter III.



## I. Development of the Program

The administration of large-scale public science programs has grown tremendously in the federal government, and to some extent in state and local government, during the past 30 years. Some people are astonished to learn that more than one-half of the super-grades in the federal government are in the fields of science and technology.

Naturally, most scientists who progress in the public service are highly trained in their special fields. Many have a Ph.D. degree in their particular field of science or an M.A. degree in engineering. As these specialists are promoted, the top management is faced with a very significant problem. While these people are highly trained in their special fields, they are now being placed in supervisory positions involving the direction of large numbers of people and significant amounts of money. The issue was also stated well by the head of the United States Forest Service speaking about a related field. He pointed out that his foresters know a great deal about trees, but when he is looking for a supervisory forester, he is seeking someone who knows something about people.

Some agencies have developed what is called the "two-track system." Scientists or engineers may progress to quite a high level in their own field. That is, they are not required to take a supervisory position for promotion. This is somewhat parallel to the establishment of faculty chairs of distinguished professorships at a university. An able faculty member need not become a chairman or a dean to achieve promotion. Unfortunately, there are very few higher positions in the two-track system in either agencies or chairs in a university. Therefore, top management in the science and engineering agencies has come to the conclusion that one approach to meeting this need is to ask universities to design and conduct a full academic program at the graduate level, with an emphasis on the

social sciences and management for top scientists and engineers who have an interest in administration and show promise for higher level posts in these fields. Some agencies have set up short-term courses in supervision and other aspects of management and the U.S. Civil Service Commission has sponsored occasional short-term courses for scientists and engineers in these fields. Since a large number of people are involved in varying levels of responsibility and in all parts of the country, a number of approaches are required to meet the varying needs.

In 1967, the University of New Mexico was one of the universities asked by NASA to establish a program to meet this need. The heads of some 18 science and technological agencies located in the Southwest were queried and they agreed with the value of a university program designed for this purpose. Several basic premises were stated to serve as policy guidelines in obtaining approval both of the university and of NASA and of other science agencies in developing the program. These premises can be summarized as follows:

1. There is a need for a university program, at an advanced level, particularly designed to prepare highly qualified students for future appointment to posts at the higher levels in public and public-private Science-Administration agencies;

2. That the determination of the nature, extent, selection of participants, and academic approach and curriculum can be more realistically and effectively formulated on the basis of the counsel of present leadership in Science-Administration agencies and that this consultative approach to design the University program should be undertaken as the major effort during the first year;

3. Several methods for consultation should be undertaken including: (a) the establishment of a Regional Advisory Committee composed of the heads of Science-Administration agencies located in the vicinity of the University; (b) by the commissioning of a number of "study papers," on each of the several aspects of the undertaking, to be prepared by the best qualified people available to develop and present the findings on each subject, and (c) by the preparation of a series of case studies illustrating the actual day-to-day programs of Science-Administration and bringing out the factors involved in decision-making and other top-level

activities in this field. Both the completed "study papers" and the series of case studies will be published in a form facilitating their use in the actual courses developed in the University for this program;

4. That the academic approach for preparation for future leadership in Science-Administration calls for an interdisciplinary and problem-oriented approach bringing together the academic areas of Political Science, Business Administration, Economics, Psychology, Sociology, and other fields as they provide knowledge, concepts, methodology and approaches applicable to this field;

5. That the level of academic work required is at the advanced graduate level designed to attract students who have already received a graduate degree in one of the related fields and are seeking to supplement this specialized knowledge with additional advanced education focused on specific preparation for responsibilities in Public Science Policy and Administration; and

6. That the University commitment of interest, attention, and support will be exercised at the highest levels of the University in the development and administration of this program.

Preliminary investigation revealed that funds beyond the normal capacity of a university graduate program are required to establish the program effectively. A faculty member who seeks to set up an interdisciplinary program soon finds that departmental funds are usually considered insufficient to meet ongoing needs and, secondary consideration is given to other departments or to interdisciplinary programs. Faculty members and departments, however, were willing to set up special courses required for a program of this type if that portion of the faculty member's salary could be provided. In addition, while there was a plethora of books and articles in the special fields of science and technology, very little organized literature was available with an emphasis on policy formulation, decision making, budgeting and finance and similar aspects involved in the administration of science agencies. Some financial support was required to develop necessary teaching materials.

Accordingly, the University of New Mexico requested financial support for the establishment of this program and NASA provided a five-year stepdown grant for

this purpose. The grant expired three years ago. An inquiry to the agencies who had sent staff members to the program indicated that they would be willing to pay the extra cost for this type of enriched and focused graduate program and the fee of \$2,500 was established for each Fellow participating in the program. Nine agencies, including the State of New Mexico and the City of Albuquerque, have sent Fellows to the program. During the six-year period and at the conclusion of the present academic year, some 70 participants will have completed the program and returned to their agencies.

## II. Curriculum

Four methods were used to develop the curriculum for the program. The first and most comprehensive was the conduct of a questionnaire survey of 193 federal scientists and engineers who considered themselves as administrators, and 195 who rated themselves as individual professional workers in science or engineering. One of the questions in the survey asked, which courses taken by the official were considered to be most helpful in their present positions. A second question asked, which courses did they wish they had taken that would assist them in meeting their present responsibilities. In addition, some five leaders in the field of Public Administration were invited to the University for periods of from a few days to several weeks and their suggestions on curriculum were obtained. Thirdly, an Advisory Committee was established composed of the heads of some 18 science administration agencies in the region. Members of the Committee collectively and individually spent a great deal of time in advising the faculty concerning the curriculum. Finally, a constant feedback has been established to obtain the views of former Fellows concerning the relative value of individual courses.

In summary, the curriculum established seeks to combine the study of policy

formulation and decision making in the total area of public policy with special reference to the field of public science administration and technology assessment. In addition, three areas often called "tool courses" are covered. The first is in the field of Personnel Administration; the second, in Budgeting and Finance; and the third, in Research Methodology, with special attention to advanced statistics and the use of the computer. In addition, each of the Fellows may take at least one optional course which may bring him up to the "state of the art" in his professional field or maybe in a completely different field.

Each Fellow is asked to conduct a research project which becomes his Masters Thesis. The curriculum is arranged for a relatively intensive program which may be completed in one academic year and meets the requirements for the Master of Arts Degree in Public Administration at the conclusion of that time period.

### III. Evaluation

There are three readily available methods of evaluating the type of program established at the University of New Mexico.

In the first place, the fact that 9 agencies are willing to use sparse budgetary resources, not only for the payment of the \$2,500 university fee, but more significantly, continuing the payment of the salaries of participants which range from approximately GS-13 through GS-15, gives evidence that agency heads feel that the program is worthy of this type of investment. In this way, the agency support method rather than the grant method may be a sounder way to support programs of this type, although some grant support will usually be required to establish and demonstrate the value of this kind of program.



A second evaluation of the program was given by a study conducted by the NASPAA Committee on Science Policy and Administration with support from the National Science Foundation, published in November, 1973. In this study, Dr. Frank Marini concludes his description of the New Mexico Science Policy Program which he calls 'Model B' with these words:

The interdisciplinary nature of the program is--as is true with most Schools and Programs of Public Affairs--one of its strongest points. The provision of courses cutting across department and school lines affords a much closer "match" to the real-life needs of the government agency at federal, state, and local levels. Since most of the participants come with advanced degrees and expertise in one of the fields of science or technology, the interdisciplinary program affords supplement to their education in the Social Science and Administration areas.

Since the Program seeks to prepare people for top posts in the future, the value of advanced graduate courses in the Program is evident. Most of the participants are selected by their agencies on the basis of evident ability and performance on the job in their technical and professional fields. The "track record" indicates that most employees are advanced to higher, more responsible positions following the successful completion of the Program.

The evaluation feedback from former Fellows, their supervisors and agencies, has been particularly helpful. The close and continuous link of the Program with its "clientele" and relevant agencies is among its strongest points.

This, then, is Model B--an educational program focusing specifically upon the advanced educational needs of those who are already in roles in Public Science Policy and Administration agencies.

In the same report, H. Clyde Reeves, Director of Technical Assistance of the State Council of Governments, evaluates the New Mexico program as useful to the development of personnel in science policy and administration in state government with the statement:

While diversity may be useful in a number of areas, Model B, providing a graduate interdisciplinary course for both pre-service and in-service students and affording ongoing research capacities, appears to meet the needs in most state as well as federal and local agencies.



A third method of evaluation has been conducted by two former participants in the first two years of the program who used a rather extensive questionnaire for two purposes: 1) to see if the participants in the program had advanced in their careers and if they thought the program had contributed significantly to this promotion; and, 2) to obtain the candid evaluation and suggestions from former participants in the program.<sup>2</sup>

The two graduates, presently employed in responsible positions in a large science agency, sent the questionnaire to some fifty-one former students who participated in the Program during the five-year period. Thirty-eight of the graduates responded to the questionnaire for a respectable 74.5% response rate. A key question asked in the inquiry was: "Please let us have your comments evaluating the impact the Program has had on your career and whether you felt that the work done here has aided your career development. The responses to this question were tabulated as follows: 33 or 87% of the respondents indicated that participation in the Program had substantially broadened their knowledge and management skills and abilities. Fifty-three percent of the respondents indicated that participation in the Program had definitely aided their career development. As an aside here, I should note that some of the more recent graduates responded with the hopeful phrase, as to whether the program had aided in obtaining promotions, with the comment, "Not yet".

Thirty-four or 89% of the respondents indicated that they would highly recommend the program to qualified members of their agency. The graduates were asked to list three or four of the courses that they felt it helped them the

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<sup>2</sup>Berniklau, V. V. and Charles E. Spath, Science Administration Leadership for Tomorrow, published by the Public Science Policy and Administration Program, University of New Mexico, June 1975.

most in the actual performance of their professional duties. Graduates indicated that they benefited most from the following courses: Budget Process, Public Administration and Public Personnel Administration.

The report concludes with the following recommendation:

" . . . it is clear that the program has been soundly established and is continuing to meet its stated objective. The interdisciplinary nature of the program has been instrumental in this accomplishment. The university now has the obligation of nurturing and improving the program, thus assuring that it meets the needs of tomorrow.

#### IV. Prospects for the Future.

While a few universities are conducting programs similar to that I have described, there is clearly a need for additional graduate university programs specifically designed to assist scientists and engineers to prepare for more responsible supervisory and management positions. These need to be located in different geographical parts of the country. Several years ago, the Committee on Science Policy and Administration of the National Association of Schools of Public Affairs and Administration issued a report entitled "Science Leadership for Tomorrow."<sup>3</sup> The report recommended that the National Science Foundation or other foundations and public agencies establish a grant program for this purpose. Whether it is through agency subsidies of individual staff members participating or by grant program, there is clearly a need for additional effort and expenditure in "filling the gap" to prepare for the management capacities needed by public sciences agencies.

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<sup>3</sup> Rosenthal, A.H., Robert F. Wilcox, Frank Marini, Science Leadership for Tomorrow: The Role of Schools of Public Affairs and Universities in Meeting Needs of Public Science Agencies, pub. with support from the National Science Foundation, Nov., 1973.