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FACULTY PERCEPTIONS OF THE RESEARCH ENVIRONMENT.

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A REVIEW OF EARLIER STUDIES OF THE "FACTORS, CONDITIONS, AND SITUATIONS THAT IMPEDE OR FACILITATE RESEARCH PRODUCTIVITY IN THE ACADEMIC SETTING" IS FOLLOWED BY THE FINDINGS OF A PILOT STUDY "TAPPING FACULTY OPINIONS AND BELIEFS CONCERNING RESEARCH AND THE ENVIRONMENT IN WHICH IT IS CONDUCTED." 52 OF 81 FULL-TIME STAFF MEMBERS AT A SOUTHERN METROPOLITAN COLLEGE OF ARTS AND SCIENCES RESPONDED TO A QUESTIONNAIRE. NEARLY HALF THE RESPONDENTS CONSIDERED RESEARCH AS IMPORTANT AS TEACHING AND ANOTHER TWO OUT OF FIVE THOUGHT IT MORE IMPORTANT. NEARLY ALL THOUGHT RESEARCH ACTIVITY A MAJOR INFLUENCE ON INSTITUTIONAL GROWTH AND DEVELOPMENT. ALTHOUGH A MAJORITY PERCEIVED THEMSELVES AS POSSESSING THE NECESSARY SKILLS AND COMPETENCIES FOR RESEARCH, FEWER THAN HALF THOUGHT THEY WERE BETTER THAN AVERAGE IN PLANNING AND DEVELOPING RESEARCH PROJECTS. FEWER THAN ONE OUT OF THREE THOUGHT CONDUCTING INDEPENDENT RESEARCH A SOURCE OF REWARDS AT THEIR INSTITUTION AND MOST JUDGED THE FACILITIES AND RESOURCES FOR RESEARCH AT THEIR INSTITUTION TO BE INADEQUATE. MORE THAN HALF GAVE PRIORITY TO BASIC RESEARCH, AND MANY HOPED THAT LOCAL FACILITIES FOR RESEARCH COULD BE IMPROVED. AREAS FOR FURTHER INQUIRY INTO FACULTY PERCEPTIONS OF RESEARCH ARE SUGGESTED--FOR EXAMPLE, THE EXTENT TO WHICH THE LOCAL FINDINGS OF THE PRESENT STUDY ARE PARALLELED IN OTHER TYPES OF INSTITUTIONS. (AF)

Abstract
LBG

Faculty Perceptions Of The Research Environment

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by

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FACULTY PERCEPTIONS OF THE RESEARCH ENVIRONMENT

Introduction

There is an increasing concern with research. The belief that research is essential to continued economic development is gaining wide acceptance, and efforts to enhance the economic progress of underdeveloped regions and nations through scientific and technological innovations have been greatly accelerated in recent years. This has produced, in turn, an increasing consideration of ways and means to foster research productivity and to encourage research creativity.

The problem of identifying, selecting, and developing creative scientific talent is especially pertinent to the nation's efforts to mobilize and better utilize its scientific and technical personnel. Equally important but receiving somewhat less attention are the problems of identifying and controlling the determinants of productivity in research. Although the distinction between creativity and productivity is usually made in terms of "quality versus quantity," there would seem to be little reason at the present time for a rigid distinction between the two. The problems of identifying and investigating the relevant variables of both types of behavior would appear to be virtually synonymous, and any empirical research contributing information on one could be expected to throw light on the other. There is an undeniable need to know more about the determinants of both.

The objective here is to consider the factors, conditions, and situations that impede or facilitate research productivity in the academic setting, to report the initial phase in the development of a survey instrument for faculty opinions and beliefs concerning research, and to develop in general a better understanding of the part played by environmental variables in research productivity.

FACTORS INFLUENCING RESEARCH PRODUCTIVITY

The majority of studies on research productivity have been directed to motivational and capacity variables within the individual scientist. A few of these studies have been concerned with the detection of differences between the scientist and layman, but most have been concerned with the ways in which the productive scientist differs from the nonproductive scientist. Investigators, although using a variety of methods and techniques, have drawn a fairly consistent picture of the creative or productive scientist. Taylor and Barron[1] have abstracted from the University of Utah Research Conferences a list of characteristics "found in study after study" of the productive scientist. Among the characteristics listed are:

(1) A high degree of autonomy
(2) A somewhat distant or detached attitude in personal relations
(3) Emotional stability
(4) A preference for precision and exactness
(5) A preference for abstract thinking
(6) Marked independence of judgment
(7) Superior general intelligence
(8) A drive toward comprehensiveness
(9) A special interest in "wagering" or risk-taking behavior.

Elsewhere Taylor has written that the creative scientist is the product of "a fortunate combination of intellectual characteristics, emotional dispositions, and a favorable climate."[2]

From studies of research scientists at Battelle Memorial Institute, Hitt[3] has proposed a two-dimensional theory of research performance. According to Hitt's findings, there are two basic dimensions to creativity in research: originality and logical reasoning. Since research personnel vary greatly in the degree to which they display these two characteristics, Hitt has proposed that research performance may be understood in terms of four types of behavior patterns: (1) high originality and high logical reasoning, (2) high originality but low logical reasoning, (3) low originality and low logical reasoning, and (4) low originality but high logical reasoning.

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1. Calvin W. Taylor and Frank Barron (Ed.), Scientific Creativity: Its Recognition and Development (Wiley, 1963), pp. 385-86.

2. Calvin W. Taylor (Ed.), Creativity: Progress and Potential (McGraw-Hill, 1964), p. 183.

3. William D. Hitt, A Two-Dimensional Theory of Creativity, paper read at the annual convention of the American Psychological Association, Los Angeles, 1964.

From a series of psychological tests and questionnaires administered to research personnel displaying the four types of behavior patterns, Hitt derived descriptions of four types of research personnel:

TYPE I - a scientist or engineer who is rated high on both originality and logical reasoning. This type of research worker is adept at both divergent and convergent thinking, is able to identify problems to be attacked by research, has considerable breadth of knowledge, is cooperative, dependable, energetic, and flexible.

TYPE II - is high on originality but below average on logical reasoning. This type of research worker is adept at divergent thinking but tends to be somewhat "unscientific" in attacking problems and perhaps eccentric in other respects. He is independent in judgment, does not hesitate to run risks, and apparently enjoys mixing with people.

TYPE III - is below average in both originality and logical reasoning. He is conforming in behavior, practical minded, cautious, and unassertive.

TYPE IV - is above average in logical reasoning but low in originality. He is above average in intelligence, dependable, and emotionally stable but inclined to be cautious and somewhat rigid in behavior.

At Minneapolis-Honeywell, Robinson[4] has studied the individual differences between research personnel who have made original discoveries or inventions and those who had developed or improved practical products or processes. From his study, Robinson derived support for his hypothesis that the practical inventor is more oriented toward achievement within the organization and the original inventor more oriented toward achievement within the larger community of society at large. Robinson concludes that the setting in which research is conducted may not be as important as how the research worker perceives his role.

Measures of Research Productivity

Research productivity has been traditionally measured by such output variables as the number of papers published in scientific, professional, and technical journals and the number of patents issued. This type of criterion has been frequently criticized as an indication of

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4. Ira E. Robinson, Basic and Improving Inventions in Industry, Unpublished Ph.D. Dissertation, University of Minnesota, 1964.

mere "quantity," and considerable effort has been devoted to the development of "qualitative" criteria such as the judgment of experts and the frequency with which an individual's published papers are cited in other publications.

The difficulties of directly measuring research productivity have necessitated the use of ratings by peers, superiors, and subordinates. Self-ratings by research personnel have proved to be less useful than ratings by others. There evidently is a tendency to rate one's own research efforts with either "undue modesty" or through "rose-colored glasses." Nor do ratings by peers seem to be of value because of a tendency to rate one's colleagues uniformly high. Available evidence suggests that ratings by superiors and other "outsiders" provide a more satisfactory indication of research performance than either self-ratings or ratings by colleagues.

Stoltz,[5] in a series of publications, has reported the development of a rating scale to be used by supervisors of research personnel. His objective has been to develop a scale which would not be limited to certain types of organizations but have sufficient generality for the evaluation of research productivity. Experience with the scale in several types of research organizations indicates that the scale measures five factors:

(1) General Productivity -- describing the person who has a high degree of technical knowledge and skill, displays organizational ability and a willingness to assume responsibility, is independent in action and judgment, and exhibits skill in technical report writing.

(2) Affability -- describing the person who tends to act in such a way as to make himself liked by others.

(3) Motivation -- dealing primarily with a person's industriousness, his willingness to exert effort, and his interest in his work.

(4) Communication -- being primarily concerned with the individual's ability to write effectively and to communicate his research findings to others.

(5) Creative Ability -- dealing mostly with versatility, imaginativeness, and ingenuity.

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5. Robert E. Stoltz, "Development of a Criterion of Research Productivity" Journal of Applied Psychology (1958), 42, pp. 309-10; "Factors in Supervisor's Perceptions of Physical Science Research Personnel" Journal of Applied Psychology (1959), 43, pp. 256-58; "Assessing Research Productivity" Personnel Administration (1962), 25, pp. 44-49.

Individuals considered to be highly productive in research have been found to be rated high by their superiors on the general productivity and motivation items. Communication skills are only moderately related to productivity, however, and affability apparently is not related at all. Creative ability, as judged by supervisors, appears to be negatively related to productivity. In discussing the negative relationship between creative ability and productivity, Stoltz suggests that the highly productive research worker is not particularly fond of routine work and not inclined to be neat, orderly, or methodical in his daily activities.

Organizational Measurement

Efforts to measure the research productivity of institutions or organizations have also relied heavily upon ratings of performance. Studies of academic institutions, however, have been inclined to use output variables as a measure of institutional quality; frequent use of such criteria as number of graduates, number of eminent alumni, number of doctoral degrees awarded, and recognition accorded graduates have been reported. For college faculties, other criteria have been the percent holding the Ph.D., the number of publications in a given time period, and the number of professional activities in which the faculty engaged.[6]

A CONCEPT OF THE RESEARCH ENVIRONMENT

The implications of studies on the intellectual and motivational characteristics of productive research personnel are quite meaningful for the development of selection criteria. These studies tell a great deal about the kind of person who should be selected for research work, and they provide much in the way of guidelines for training future personnel. They tell virtually nothing, however, about how to increase the productivity of research personnel already on the job.

Although socio-economic factors, working conditions, and organizational arrangements are generally recognized as factors affecting research productivity, research on the general environmental variables influencing productivity has been noticeably neglected. Few studies have been directed to the essentials of a favorable environment for research, and as Taylor had indicated, "there is a real need for research on the environmental conditions that are conducive to high-quality scientific research."[7]

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6. See Allen H. Barton Organizational Measurement and Its Bearing on the Study of College Environments, College Entrance Examination Board, 1961.

7. Taylor, op.cit., p. 183

The belief that productivity is a function of the research environment as well as intellectual and motivational characteristics of the research worker is well supported. As Kaplan[8] has pointed out, the institutional context determines the nature of research organization which affects, in turn, the atmosphere in which the research is conducted. Kaplan reports that the latter is perceived as important by research directors because they believe it affects the recruitment and turnover of research personnel. Research directors further believe that important aspects of the research environment are the amount of free time for the scientist's own research, the encouragement to publish, and the opportunity to attend professional meetings.

In a seminar of creative research personnel conducted by Hitt[9] at Battelle Memorial Institute, participants in the seminar agreed that creative research was dependent upon such environmental factors as: (1) managerial approval, (2) approbation of colleagues, (3) the freedom of the individual to inquire, (4) proper supervisory support, (5) monetary reward, and (6) a desirable physical environment.

The importance of cultural or traditional values for research productivity has been stressed by Knapp[10] in his studies of the undergraduate origins of scientists and scholars. In his study with Goodrich of American Men of Science, Knapp found a geographical gradient showing the Middle and Far West to be highly productive in scientists, with the Eastern Seaboard "of moderate production, and the South conspicuously low." Unable to link the geographical differences to economic or population indices, Knapp concluded that the differences must be attributed to cultural factors. In studying the 25 institutions producing the highest rate of scientists, Knapp concluded that scientific interest apparently has its greatest influence in a transition period between the relinquishment of Protestant Orthodoxy and the development of a fully secularized outlook. For departments showing an unusually high rate of scientists, Knapp concluded that the two factors related to departmental success were esprit de corps and "severity of academic standards." He described the successful teacher as masterful, warm, and intellectually eminent.

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8. Norman Kaplan, "The Relation of Creativity to Sociological Variables in Research Organizations" in Taylor and Barron, op.cit., pp. 195-204.

9. William D. Hitt, A Syllabus for a Seminar in Creative Research, Battelle Memorial Institute, Columbus, Ohio, 30 pages.

10. Robert H. Knapp, "Demographic Cultural and Personality Attributes of Scientists" in Taylor and Barron, op.cit., pp. 205-16. See also: Knapp and Goodrich, Origins of American Scientists (University of Chicago Press, 1952), and Knapp and Greenbaum, The Younger American Scholar (University of Chicago Press, 1953).

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in the same way. It would also be interesting to know to what extent faculty perceptions varied with the organization of colleges and universities. A comparative study of university, senior college, and junior college faculties should be especially revealing.

Perhaps even more interesting would be the question of congruence or discrepancy of perceptions between faculty and administration. Do college administrators agree with faculty on the importance of certain environmental variables affecting research productivity? To what extent would a discrepancy between administrator and faculty perceptions impede research on the part of the faculty?

More speculative questions may be raised concerning the implications of faculty perceptions. If, as Robinson has concluded, the research setting is not as important as how the research worker perceives his role, the question of how the faculty member's perceptions of his research environment affects his role perception would seem to be especially pertinent.

There is the additional question of regional differences. The college surveyed here is located in a metropolitan area of the South. If, as many critics have pointed out, research has not been one of the South's traditional values, would the same widespread interest in research be found in other colleges within the same region? And if not, what would be some of the forces producing the interest in research in this particular college?[17]

It is obvious that more questions have been raised than answered. There has been an effort to emphasize the importance of environmental variables in research productivity, and a pilot study has indicated that faculty opinions and beliefs concerning research are highly similar to those of research workers in other organizations, but a more extensive study of faculty perceptions is greatly needed.

As a form of "research on research," the study of the research environment would seem to be unusually promising. There would seem to be the highly practical advantage of such research in that of the many variables influencing research productivity, those in the research environment should be the most accessible to study. Personal characteristics of the scientist or scholar are of definite importance as determinants of productivity, but they are not as amenable to study and change as environmental variables would seem to be. If creativity and productivity in research are earnestly desired, the research environment should be the most fruitful place to search for factors impeding or facilitating research.

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17. For further discussion of the role of research in the South, see Cameron Fincher, Research in the South: An Appraisal of Current Efforts, Georgia State College, School of Arts and Sciences Research Papers, Number 5, October 1964.

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Thistlethwaite[11] and Holland[12] have criticized Knapp's studies because they did not control for quality of entering students. In their studies of National Merit Scholars and Certificate of Merit winners, they have employed an index of productivity based on the discrepancy between the expected rate of earned doctoral degrees and the actual rate. Although no differences between other regions of the nation were evident, they found that colleges in the South rank lowest on indices of both scientists and scholars. Neither index was found to correlate highly with organizational and structural characteristics of the colleges such as type of student body, number of volumes in the library, size of freshman class, size of city, student-faculty ratio, level of training offered, religious affiliation, and type of control; but colleges successful in encouraging scholarly achievement were found to have: (1) excellent social science faculties and resources, (2) a flexible curriculum, and (3) energetic or controversial instruction. Colleges high in the production of natural scientists were found to be characterized by an absence of: (1) an outstanding social science faculty and resources, and (2) a close degree of supervision.

An undeniably important aspect of the research environment must be the behavior and attitudes of the research worker's supervisors and administrators. Hitt[13] has reported a study at Battelle in which staff members identified the following as supervisor characteristics encouraging creative behavior:

(1) A sincere appreciation of creative behavior.

(2) Understanding of human behavior.

(3) Ability to restrain himself from establishing too narrow boundaries on the problems he assigns to those who work with him.

(4) Ability to create a work environment in which research workers feel free to explore, to discuss, and to challenge.

Baumgartel[14] has stressed the importance of "leadership style" as a factor influencing research productivity. Comparing three types of leadership -- laissez-faire, participatory, and directive -- in 20 research

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11. Donald L. Thistlethwaite, "The College Environment as a Determinant of Research Potentiality" in Taylor and Barron, op.cit., pp. 265-77.

12. J. L. Holland, "Undergraduate Origins of American Scientists," Science, 1959, 126, pp. 433-37.

13. Hitt, A Two-Dimensional Theory, op.cit.

14. Howard Baumgartel, "Leadership Style as a Variable in Research and Administration," Administrative Science Quarterly, December 1957, pp. 344-60.

laboratories, Baumgartel concluded that high-level professional personnel do respond to situational factors in organization and that the leadership climate is an important variable in determining the individual research worker's motivations and attitudes.

It is evident from the preceding discussion that there is widespread agreement that environmental factors are pertinent to research productivity. There is little agreement, however, concerning the specific environmental variables which are most conducive to research productivity, and there is even less agreement concerning the relative importance of each.

Participants in the Utah Conferences have concluded that research on the general environmental conditions conducive to first-rate scientific research "needs major encouragement." They point out that "there is a dearth of literature in the psychological journals regarding education's role in the development of creative scientific talent," and they state that there is a special need for "extensive, systematic, and controlled investigations on a cross-sectional as well as a longitudinal basis."[15]

The reasons for studying the research environment, therefore, are numerous. There is a need to identify the conditions and situations in the environment which impede or facilitate research productivity, and there is a need to learn how these may be altered or changed to produce the desired effect of greater productivity or higher levels of creativity. Such studies are especially desirable because there is good reason to believe that environmental variables, by and large, are more amenable to change, or subject to direct manipulation, than the other relevant variables in the situation. There is also the implication that by altering the environmental variables affecting research, a quicker, broader increment in productivity may be produced. Selection and training criteria necessarily involve long-term planning whereas alteration of relevant environmental variables implies more direct and more immediate benefits.

RESEARCH ENVIRONMENT AND THE COLLEGE FACULTY

The manner in which a college faculty perceives the research environment of their particular institution may be regarded as a basic determinant of research productivity. This implies that as the members of the faculty perceive the environment in which they are working, their actions will be governed accordingly. If they perceive the research environment as lacking either facilities for research or encouragement to produce, it is highly unlikely that they will extend great effort to produce. If, on the other hand, they perceive the environment as facilitating their research efforts, and if they believe their administrators and professional colleagues expect them to produce, they will endeavor to do so.

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15. Taylor and Barron, op.cit., p. 373, p. 377.

It should be stressed, however, that faculty perceptions are but one of many determinants of research productivity. The intellectual and motivational characteristics of faculty members are of major importance, but an adequate concept of the research environment must reject the notion that research and scholarship are merely a matter of individual motivation. It is naive to contend, as many do, that faculty members who want to do research will do so regardless of a lack of administrative encouragement or in spite of negativistic attitudes on the part of their professional colleagues.

An adequate concept of the research environment must also reject the notion that the only way to encourage or promote research productivity is through the selection of younger faculty members who are research oriented. Experience clearly demonstrates that younger faculty members are not attracted to academic environments in which research is not an ongoing process; they are attracted to and actively seek those academic settings where research is not only an opportunity but an expectation. It is the challenge and the stimulation of new ideas and new methods of investigation that bring new faculty members into the productive academic communities of the nation. The scholar or scientist with a recently acquired Ph.D. is able to pick and choose in a manner that college administrators and older colleagues must surely respect. If, as some believe, there are hints of an intellectual renaissance in this nation, the younger scholars and scientists must surely be aware of it. By the same token, it is their intense desire to participate that makes them seek out those colleges and universities where the renaissance is already under way.

In contrasting the industrial research environment with the academic setting, Charles D. Orth[16] has emphasized the latter's reputation for permissiveness, lack of pressure, and concentration on ideas. He states that an emphasis on basic research and on the discipline of scientific methodology is the most important single characteristic of the academic community, and that the basic motivation is a desire for intellectual development and achievement. The basic value of scientists, he finds, is the fact that they are "evaluated according to their knowledge of their field, the degree of expert methodology they display in their work, and the originality of thought and method evidenced in reports of their work."

A SURVEY FORM FOR FACULTY OPINIONS AND BELIEFS

An effort has been made to construct an instrument for tapping faculty opinions and beliefs concerning research and the environment in which it is conducted. It is believed that such a survey form will be of considerable value in developing an adequate understanding of how faculty

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16. Charles D. Orth, "The Optimum Climate for Industrial Research," Harvard Business Review, March-April 1959, pp. 55-64.

members perceive the environmental variables affecting their own research efforts, and in identifying factors and conditions which can be readily altered to facilitate research and scholarship. If, as stated earlier, faculty perceptions of the research environment are a basic determinant of their research productivity, it would seem to be especially valuable to have some systematic means of ascertaining precisely how they perceive the research environment.

Purposes and Assumptions

An instrument for tapping faculty opinions and beliefs must necessarily be based on a number of assumptions which it is well to make explicit. Since the primary purpose of the survey form discussed here is to solicit faculty opinions and beliefs concerning the environment in which they conduct research, one of the basic assumptions underlying the questionnaire may be stated thus:

> Research productivity is a function of interacting environmental variables. Research flourishes in an environment where there are active inducements for faculty members to produce research; it suffers when the environment limits or impedes research activities.

In devising the questionnaire, a broad view of research has been taken. Research and scholarship are regarded as two sides of the same coin; the former is defined as any systematic effort to extend or further human knowledge, and the latter as any systematic effort to enrich or interpret human knowledge.

No effort, either directly or indirectly, has been made to incorporate an evaluation of the quality of research currently being conducted by faculty members. Because a major purpose of the questionnaire survey is to identify conditions and factors in the environment that impede research, it is assumed that faculty members will be more frank in their answers if they are not under scrutiny themselves.

A second assumption underlying the survey instrument is that:

> Research productivity in the academic community may be facilitated more readily by an alteration of administrative policies and operational procedures than by establishing different selection criteria or by promoting change in current training methods.

This assumption does not deny the importance of selection criteria for employing new faculty members. It does regard selection and training, however, as having greater implications for long-term planning, and it takes explicit recognition of the necessity to begin somewhere.

A third assumption underlying the survey may be stated in the following manner:

> Research and scholarship must be viewed in a broad perspective as activities which not only enhance the faculty member's teaching effectiveness but contribute to his professional development as well.

A corollary of this assumption would seem to be that almost any activity which enhances the status or reputation of a faculty member contributes something to his teaching effectiveness. Or stated differently, the effective teacher must produce or enrich knowledge as well as distribute it.

Items and Content

The questions contained in the survey form are designed to elicit faculty opinions and beliefs on a diversity of factors and conditions related to research productivity. It would seem especially important to ascertain how the faculty perceive the prestige, status, or reputation of their college; what they believe to be the emphasis placed on research by college administrators, departmental chairmen, and their colleagues; how important they regard research to be for the future development of the institution; how intense are their own desires to do further research; and the extent to which they believe their own research capabilities to be currently used.

In an effort to identify specific conditions and situations relative to the facilitation of research, special attention has been directed to the following questions:

> How do the faculty regard their own research skills and abilities? -- Do they regard themselves as competent in such matters as planning and developing research projects, making original discoveries and interpretations, and originating and developing ideas?
>
> What factors do the faculty members perceive as important for advancement? -- Do they perceive a definite encouragement of intellectual activity, or do they view opportunities for advancement primarily in terms of personal, social, or administrative skills?
>
> How adequate do the faculty perceive the resources and facilities of the college? -- Do the faculty regard the college's facilities and resources as adequate for research, or do they believe that these conditions and factors are not conducive to research productivity?

What specific factors do the faculty identify as limiting their own research efforts? -- Which of these factors could easily be eliminated or corrected so as to spur greater research effort?

In the event of expanding opportunities for research, what priorities do the faculty believe should be established? -- To what type of research would they give emphasis?

What specific suggestions can the faculty make for the improvement of research opportunities? -- What concrete steps could the administration take to improve the research productivity of its faculty?

To facilitate faculty response the questionnaire has been structured as a checksheet on which the faculty member indicates the degree or extent to which he believes certain conditions and situations to exist in his particular institution. The format permits the expression of opinion or belief on each of the questions listed above.

A PILOT STUDY

The survey instrument described above has been used in a pilot study of faculty opinions and beliefs in a college of arts and sciences. The college is located in a metropolitan area of a southern state, is publicly supported, offers undergraduate majors in a variety of subject matter fields, and graduate work at the Master's level in selected areas. As a college of arts and sciences, the college is relatively new, having been authorized to confer the Bachelor of Arts and Bachelor of Science degrees in 1957. The following discussion is based on the return of 52 questionnaires from 81 that were distributed to full-time faculty members in the college.

Highlights of the Survey

Only the major findings of the survey need be summarized to demonstrate the importance of determining faculty opinions and beliefs concerning research. Granting that some selective bias is always involved in the return of questionnaires, it would follow, nonetheless, that the response to the questionnaire is quite revealing. There can be no doubt that the survey touched an area in which the faculty had definite opinions and that they were not only willing but eager to express their attitudes and beliefs on this particular subject.

Nor can there be any doubt that the responding faculty members in this particular college regard research as an important aspect of the academic life. In comparison to "teaching and other duties," almost one half of the responding faculty regarded research as "equally important" and over two out of five believed it to be "more important." An even higher percent of the faculty believed research to be a major influence in the future growth and development of the institution.

Faculty members responding to the survey questionnaire definitely perceive themselves as possessing the necessary skills and competencies for research. A majority or the respondents believed themselves to be competent in such matters as independently carrying out their own ideas, originating and developing ideas, getting along well with superiors, effectively communicating ideas to others, solving problems of a practical nature, making original discoveries or interpretations, implementing the ideas of others, working in close cooperation with others, and analyzing or interpreting the work of others. Only in the matters of efficiency in routine, detail work, and in planning and developing research projects did a majority of the faculty not perceive themselves as "better-than-average." Accepting the disclaimer that any faculty would naturally view themselves "through rose-colored glasses" it would follow, nonetheless, that any lack of research productivity on the part of this particular faculty could not be attributed to "self-doubt" or to a perceived "inability to conduct research."

Institutional rewards and inducements must be regarded as a major factor in the research environment. Each institution, in its own way, rewards certain forms of behavior while penalizing or discouraging others, and the extent to which research productivity is perceived as offering "rewards" is a crucial factor in faculty efforts to conduct research. When asked which factors they regarded as important to "success" in the college, the faculty in this college attributed major importance to social factors such as getting along well with colleagues, knowing the right people, and willingness to take on extra duties. Less than one out of three perceived as of major importance such factors as originating and developing ideas, planning for future development, conducting independent research, and holding office in state, regional, or national professional organizations. Less than one out of two regarded such matters as length of service, dedicated teaching, academic honors and recognition, and faculty committee work as of major importance in determining "success" at the college.

When asked to rate the satisfactoriness of numerous factors and conditions involved in research, the responding faculty displayed an extreme reluctance to regard any of them as excellent. A majority perceived such facilities and resources as research funds, clerical assistance, laboratory and technical assistants, the college's purchasing system, equipment and physical facilities, time for planning and evaluation, salaries, publication outlets, administrative policies, editorial assistance, funds for travel, and adjustments in teaching load as "below

average" or "very poor." Perceived as "good" or "adequate" by a majority were such factors and conditions as academic freedom and job security, freedom to make suggestions, opportunities for consultation with other faculty, and fringe benefits.

To solicit opinions and attitudes that might not be evident in the restricted choice questionnaire, two open-end questions were asked at the end of the survey form. One of these questions asked to what type of research the faculty member would assign priority if research opportunities at the college were expanded. Classification and tabulation of the responses to this question revealed a strong interest on the faculty's part in basic or fundamental research. Well over one half indicated that priority should be given to basic research, and no more than a third even mentioned another form of research. Some faculty members, however, expressed the desire to see opportunities expanded for "any and all types" of research.

When asked what suggestions they could make for the improvement of research opportunities, the responding faculty expressed their attitudes and opinions freely. Many restated the need for time, funds, and equipment, but virtually all expressed opinions and beliefs concerning steps that might be taken to improve the research environment. The gist of their responses would seem to be a strong belief in the importance of research, a definite belief that conditions and circumstances could be greatly improved, and a hopeful expectation that they would be.

THE NEED FOR FURTHER RESEARCH

The development of a suitable instrument for surveying faculty perceptions of the research environment offers considerable promise for a better understanding of those factors, conditions, and situations affecting research productivity in the academic setting. The pilot study has indicated that faculty beliefs and opinions concerning research productivity are highly similar to the beliefs and opinions of research workers in other types of research organizations. Faculty members apparently agree that environmental variables are important, and they apparently have strong opinions concerning conditions and situations that facilitate or impede research productivity. There is a need, however, for further research on both the general and the specific questions that are raised by the efforts thus far to develop a suitable survey instrument.

There is, first, the question of intercollege differences. The single college surveyed with the instrument is by no means representative of the colleges of arts and sciences in the state, region, or nation, and it would seem to be of especial interest to know if faculty members in other colleges of arts and sciences, other colleges, and in other sections of the state or nation perceive the research environment

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