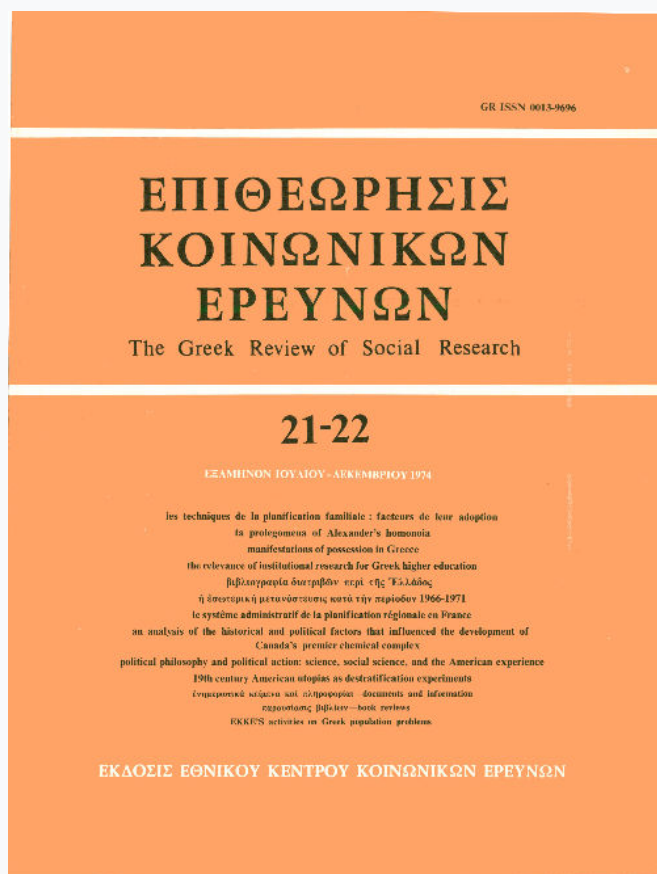


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## The relevance of institutional resercah for Greek higher education

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# the relevance of institutional research for Greek higher education

by  
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*The process of reasoning, my friend,  
is neither contrary to the dogma of  
the Church nor alien to philosophy;  
but it is indeed the only means of find-  
ing that which we seek.*

MICHAEL CONSTANTINE PSELLUS  
*Letter to Ecumenical Patriarch John VIII Xiphilinos*

## introduction

Influenced by Napoleonic France, continental European higher education tends, today, to be *centralized* as a department of government through a nation's ministry of education. Most of the administrative services for higher education are centered in the ministry. The institute, college, or university tends to have a skeletal administrative staff, led by elected faculty officers and a small faculty body. Greek higher education follows this French pattern. And Greek higher education appears to be governed through the French principles of *droit administratif* and *tutelle*.

American higher education, public and private, organizationally tends to be *decentralized* down to the individual institution of higher learning. An elaborated administrative apparatus is developed at the institutional level. Federal and state governmental agencies have varying degrees of informative, advisory, consultative, coordinative service and/or direct administrative control over some 2,686 institutions of higher learning.<sup>1</sup> The complexity of American higher education can be seen through the huge two volume 1970 edited work of Knowles, *Handbook of College and University Administration*.<sup>2</sup>

To date I do not know of any scientific study in administrative theory that even remotely suggests the superiority of one administrative tradition and style of academic governance over the other. There is much to be said for each. There is, no doubt, much to be said against both.

A common fact is present in both administrative systems of higher education. That common fact is that each particular university, college, or institute requires an efficient and effective cybernetic system of organizational intelligence so that incipient institutional crises can be ameliorated and educational

1. US Department of Health, Education and Welfare, *Education Directory—1972-73: Higher Education* (OE: 73-11404; Washington, D.C.: US Government Printing Office, December 1972), p. xxii.

2. Asa S. Knowles (ed.), *Handbook of College and University Administration: General and Academic* (New York: McGraw Hill Book Company, 1970), 2 vols.

effectiveness humanely can be achieved.<sup>1</sup> A significant key to cybernetic systems is the faculty. Regardless of a nation's social structure that may support an elitist status and role for college and university faculty, there is no evading the fact that students are the clients of the professors, which students are to be served by the faculty as whole persons with needs and creatures of God. In this Orthodox Christian nation of Greece, this view should be axiomatic for the university-level faculty as well as the ministry of education, even though it be breached through the frailties of particular men.<sup>2</sup> An effective cybernetic system of organizational intelligence recognizes and can document the fiduciary trust that the ministry of education and each university faculty member has with each of their student clients.

Recently, American higher education has developed an institutional-level mechanism for organizational intelligence. This mechanism is designed systematically to provide the university trustees, faculty, administration, and students with organizational intelligence about themselves in relation to each other and the wider community. The university is a community of teachers, students, administrators, staff personnel, and the trustees. Their organizational self-knowledge about their own interrelationships is required in order to cure institutional ills, forestall institutional crises, and plan institutionally for effective and humane education. This institutional mechanism has varied names. Most often it is known as the Office of Institutional Research or, as in my own university, the Office of Institutional Studies. The significance of this institutional mechanism is underscored by the fact that within the last decade a national organization of directors of such offices has come into being, viz., the Association for Institutional Research. The 1972-1973 membership of the Association for Institutional Research is 963 persons.<sup>3</sup>

The thrust and purpose of this paper is to suggest how American colleges and universities have used

the Office of Institutional Research for systematic and cybernetically-directed organizational intelligence. This institutional-level mechanism might have some relevance for Greek institutions of higher learning. That judgment as to relevance rests, however, with those who have the responsibility and the care for Greek higher education.

#### institutional research

The purposes of institutional research have been discussed and even debated hotly. But Stecklein's list appears comprehensive enough to merit presentation here:

1. Institutional research service to faculty members:
  - a. To learn, by controlled experimentation, the potentialities, outcomes, or limitations of their instruction, e.g., supplementary techniques useful in instruction or which produce certain outcomes of instruction; in general, to provide a research basis for critical examination of teaching procedures and practices.
  - b. To obtain a better understanding of the purpose of a course or a curriculum.
  - c. To determine a basis for comparative judgments concerning instruction and curriculum building.
  - d. To obtain a better understanding of admissions practices, examinations procedures, grading practices, and work loads.
  - e. To obtain a better understanding of the role of the faculty member in the administration of a college or university, e.g., of the pressures and forces causing certain administrative problems and/or actions, or of the desirability of a faculty voice in administrative policy making.
  - f. To develop better understanding of the factors that influence costs of instruction and other functions of an institution of higher education.
  - g. To obtain an understanding of the way in which curricular decisions can affect such things as space utilization, building costs, and various routine operations of an institution.
2. Institutional research service to the administration:
  - a. To serve most of the purposes listed above.
  - b. To identify and analyze factors that influence costs or efficiency of operation.
  - c. To obtain overall pictures of the characteristics of the undergraduate and graduate student body, of the faculty, and of the curriculum.
  - d. To provide continuous up-to-date data on institutional characteristics such as size and rank of staff, available space, number of research contracts, amount of staff effort expended upon research, public and professional services, etc.

1. James Steve Counelis, «The Open Systems University and Organizational Intelligence.» *Institutional Research and Institutional Policy Formation: 11th Annual Forum of the Association for Institutional Research 1971*, edited by Clifford T. Stewart (Claremont, Ca.: Office of Institutional Research-Claremont University Center, 1971), pp. 86-89. See also: Harold L. Wilensky, *Organizational Intelligence: Knowledge and Policy in Government and Industry* (New York: Basic Books, Inc., 1967).

2. Counelis, «Open Systems University.» *op. cit.*, pp. 88-89. See also: (1) James Steve Counelis, «Orthodox Christian Higher Education.» *The Christian Scholar*, Vol. XLVI, No. 2 (Summer 1963), pp. 145-154; (2) —, «Patristic Man, Science's Man and Education.» *The Greek Orthodox Theological Review*, Vol. XII, No. 1 (Summer 1966), pp. 84-91; (3) —, «The American Christian University: A Position Paper.» *The Christian Scholar's Review*, Vol. II, No. 3 (1972), pp. 236-241.

3. *Directory of the Association for Institutional Research: 1972-73*, p.i.

- e. To bring to the attention of the administrators trends taking place in any of the characteristics mentioned above.
  - f. To provide data and information useful in obtaining financial support.
  - g. To provide data useful in explaining the mission and achievements of the institution.
3. Institutional research service to coordinating groups or other outside agencies.<sup>1</sup>

This list provides a sort of holistic definition of what institutional research is conceived to be. This definition must be placed within the American higher education milieu of ever-escalating informational demands from within and from without. Institutional data-gathering and resultant studies are becoming high priority budget items, rapidly. These informational demands posit the requirement for university/college management information systems which have the characteristics of ease in retrieval and high flexibility in use. Huge computer data banks and large scale computer algorithms make this information requirement possible of fulfillment. Standardized statistical reports as well as specialized studies, be they in space utilization, resources allocation, faculty evaluation, curricular experiment, budgeting, or cost analysis, are now being done with varying degrees of success.

Private enterprise, university faculty, offices of institutional research and governmental agencies have developed a whole raft of computer software and scholarly theory on the measurement and evaluation of higher education inputs and outputs. Among the leaders in the field is the federally funded National Center for Higher Education Management Systems of the Western Interstate Commission for Higher Education. This group of professionals has developed standard lexicons for the several higher education categories, such as, accounting, academic programs, faculty, facilities, students and governance mechanisms. Across-the-board institutional comparison by standard categories can thus be made systematically.

The work of this group is having wide impact on some 800 institutions in the fifty states. NCHEMS has produced an induced course load matrix generator, a cost simulation model, and a resource requirement prediction simulation model, all of which are being field tested.

Institutional research professionals have developed considerable scholarship and many techniques in enrollment prediction, cost work, space utilization and budgets. Less work has been done in curriculum

evaluation, faculty evaluation and values analysis. A review of the field can be found in Dressel and Associates' handbook,<sup>2</sup> scientific journals as well as the *Proceedings* of the Association for Institutional Research.

There is no implication made here that all or even a majority of the Offices of Institutional Research are at the level of funding or sophistication to even use computer simulation models. Certainly the state institutions are more quickly pushed in this direction as are the wealthier private institutions. However the first significant step to more sophisticated levels of institutional research is the planned development and installation of an institution-wide management information system. For a small nation like Greece, early standardization of the lexicon of higher education reporting categories would serve to prevent years of grief later if institutional-level idiosyncratic lexicons are first installed. Manual systems of record keeping are most inefficient to the task of continuing institutional self-study long range planning and governmental development.

#### **University of San Francisco experience in institutional research**

Permit the prefacing of the University of San Francisco's experience with institutional research with some background on the university.

Since 1855, the University of San Francisco has offered higher education in the city of St. Francis. Today, the University is a moderately-sized private institution of some 6000 full/part time students, 425 full/part time faculty and has an operating budget of over thirteen million dollars. The University of San Francisco is a Roman Catholic/Jesuit institution, that is open to all to study, and an equal opportunity employer under federal law.

Currently, the University is offering undergraduate degree (B.A. and B.S.) programs in twenty-two fields of arts, sciences, business administration, and nursing. The School of Law offers legal education leading to the Juris Doctor degree. Through the University's Graduate Division, the following masters' degrees and programs are offered: (1) Master of Arts: education, English, government, history, and theology; (2) Master of Arts in Teaching: biology, English, government, history, mathematics, religion, and sociology; (3) Master of Science: biology and chemistry; (4) Master of Business Administration; (5) State of California education credentials (licenses) in six areas: educational administration and supervision,

1. John E. Stecklein, «Institutional Research» in Knowles, *Handbook/General, op. cit.*, Section 4, ch. 9, pp. 125-126.

2. Paul L. Dressel, et al., *Institutional Research in the University: A Handbook* (San Francisco, Ca.: Jossey-Bass, Inc., 1971).

elementary teaching, secondary teaching, pupil personnel and counseling/guidance, community college teaching, and school librarianship. These degree programs are given through nine academic units: (1) College of Arts; (2) College of Science; (3) College of Business Administration; (4) School of Education; (5) School of Law; (6) School of Nursing; (7) Graduate Division; (8) Evening College; (9) Summer Session.

The Office of Institutional Studies was established in the University of San Francisco in 1968. And when I assumed the directorship in 1971, there was the beginning of institutional recognition of the need for real institutional research. This Office is attached directly to the university president; and as director, I sit on the President's Council.

The management information system of the University of San Francisco is a mélange of manual and computerized records. But only one time series of data existed in 1971. Since that time and at considerable expense in hand labor, four sets of time series, beginning with FY 1968-1969, have been created. These time series are: (1) student credit hours; (2) student head count; (3) course histories: head counts and units; (4) course enrollment by faculty and term. All of these time series are disaggregated to the levels of courses, departments, schools/colleges, year and term, student status: undergraduate/graduate/professional, and student residence: full time and part time. Other time series are being developed in areas concerned with student and faculty characteristics, staff, and financial indicators.

The management information system of university, college, or institute is fundamental to all institutional self-study or cybernetic feedback. Hence in the absence of a machined data bank, such time series as these are preliminary data developments for serious institutional research. The following things have been done so that the University can get a handle on its fiscal problems. For the first time at the University and based upon the time series alluded to above, regression estimates were made in the area of student enrollments by student credit hours and head count for the development of FY 1973-1974 budget.<sup>1</sup> From these same time series and for the first time in the University, a five year projection to FY 1978-1979 was made for long-range planning and University priorities development in that context.<sup>2</sup> One affirmative result of these studies has been that the acrimonious division of opinion as to what the Uni-

versity facts are has disappeared. And University decision-making properly has settled on the problems of University priorities, short and long-range planning and the realism that is appropriate thereto.

Other studies have been done over time as well. A description and brief evaluative commentary was done on graduate education.<sup>3</sup> At the time when there was a question about the abuse in the faculty use of the grade "Inc.," a study was done to objectify the issues.<sup>4</sup> A 1900-1972 time series on educational costs at the University was produced to provide historical and empirical perspective thereon.<sup>5</sup> Two empirical studies on degrees and other awards given by the University since 1863 were completed.<sup>6</sup> This was done to provide some minimal measure of educational output over time. Surveys on University community attitudes on the assets and liabilities of the University,<sup>7</sup> attitudes of graduating seniors,<sup>8</sup> and faculty salary and age studies have been done.<sup>9</sup> Some of these have been published; others are in-house concerns. Nonetheless, qualitatively these studies are positive informational feedback that stabilize the institution through reality-testing.

In my role in institutional research, I have aided individual faculty in their own research projects, aided the School of Education to develop its proposal to become a school, provided randomized sampling

3. James Steve Counelis, *Graduate Education in the University of San Francisco* (San Francisco, Ca.: University of San Francisco—Office of Institutional Studies, 1972).

4. James Steve Counelis, *The Grade of Incomplete: A Brief Review and Comment* (San Francisco, Ca.: University of San Francisco—Office of Institutional Studies, 1972).

5. William J. Dillon, *University of San Francisco Historical Series Charts on Educational Costs: 1900-1972* (San Francisco, Ca.: University of San Francisco—Office of Institutional Studies, 1972).

6. The two studies are: (1) William J. Dillon, *Academic and Professional Degrees and Other Certificates of the University of San Francisco: 1863-1971* (San Francisco, Ca.: University of San Francisco—Office of Institutional Studies, 1972); (2) William J. Dillon, *University of San Francisco Awards: 1905-1972* (San Francisco, Ca.: University of San Francisco—Office of Institutional Studies, 1972).

7. The University of San Francisco cooperated with the State of California Joint Legislative Committee for the Master Plan in administering the ETS *Institutional Goals Inventory*. Also, the Office of Institutional Studies conducted for the President an open-ended questionnaire survey of the entire University community: trustees, regents, students, faculty, alumni, parents, administrators, and Jesuit community. This latter was an in-house report to the President, the findings of which were released by the President's Office.

8. Two recent studies are: ((1) William J. Dillon and James Steve Counelis, *Future Plans of Graduating Seniors, 1972 and A Comment on New Graduate Programs* (San Francisco, Ca.: University of San Francisco—Office of Institutional Studies, 1972); (2) William J. Dillon, *Future Plans of Graduating Seniors, 1973* (San Francisco, Ca.: University of San Francisco—Office of Institutional Studies, 1973).

9. These were in-house non-published studies submitted to the administration by memoranda.

1. James Steve Counelis, *Estimates in Futures: Projections, Planning and the University Budget* (San Francisco, Ca.: University of San Francisco—Office of Institutional Studies, 1972).

2. James Steve Counelis, *University Planning and Trial Estimates in Futures* (San Francisco, Ca.: University of San Francisco—Office of Institutional Studies, 1973).

of students for student and faculty surveys connected to behavioral science courses, aided the School of Nursing in its own faculty evaluation work, and served as a member on the University Committee on Research.

One of the major tasks of institutional research professionals is scholarship. An area of concern is model building for the development of computer algorithms. The application of mathematics and symbolic logic to the solution of generic problems is an activity of long standing. Computer science people, operations researchers, educational theorists, and behavioral scientists in all areas and in particular administration have done much here.<sup>1</sup> In my career, I worked in the area of higher education model development that is moving rapidly to the symbolic and mathematical propositional levels.<sup>2</sup> At this University, the practical problems of tuition-pricing and self-evaluative performance appraisal in the University have been modeled at the symbolic propositional level.<sup>3</sup> The model for self-evaluative performance appraisal became the basis for University practice in priorities development and attitudinal assessment of the University through broad University surveys. The tuition-pricing by matrix has yet to be tried. The Office of Institutional Research in any university, college or institute provides an excellent vehicle through which systematic science and *praxis* can be brought to the field of higher education conceived as a discipline. To that goal, I am dedicated as many others are.

The role values in this university cybernetic service needs full exploration. And because the University of San Francisco is an institution dedicated to the teaching of Christian values, study of this aspect was undertaken broadly. This writer's Orthodox Chris-

tian commitment places values study in the forefront of university planning, far beyond the arbitrary assignment of utilities to indifference curve analyses and institutional simulation model assumptions.<sup>4</sup>

In September when I return to the University, I will embark upon the total design and phased installation of a comprehensive management information system. This University-wide system would be designed to dovetail with the NCHEMS lexicons.<sup>5</sup> A computer data bank with appropriate software will help the University in its management, planning, evaluation and constant improvement of higher education at the University. The University of San Francisco has an RCA 70-46 computer at its disposal to which access terminals can be connected to the administrative offices requiring them.

The economic depression in American higher education is very broad in swath. The history of American institutions of higher learning is replete with the demise of colleges and universities. University management is concerned with a relevant and humane education that is instructionally effective, socially relevant, and economically efficient. These notions are becoming more systematic and pragmatized. The proposed management information system for the University of San Francisco is intended for those goals.

For the moment, the experience of institutional research at the University of San Francisco is just beginning. Hopefully, the institutional experience qualitatively will improve the University products of instruction, research, and public service.

#### questions of relevance

In 1964, Russett and his colleagues classified Greece to be at that stage of economic and political development which they termed «industrial revolution» society. The Russett study was an empirical study based upon the best data available.<sup>6</sup> In relation to this

1. The literature in this area is immense. See broad bibliography in the Appendix for a sampling of literature.

2. Several studies are: (1) James Steve Counelis, *American Government, Higher Education and the Bar* (Ph. D. dissertation—L.C. Microfilm; Chicago, Ill.: The University of Chicago/Department of Education, 1961); (2) —, *Macro-Administration in American Higher Education* (AERA paper, University Park, Pa.: The Pennsylvania State University—College of Education, 1967); (3) —, «What is an Interdisciplinary Course in the Social Sciences?» *Community College Social Science Quarterly*, Vol. III, No. 2 (Winter 1973), pp. 29-31, 36; (4) —, *Toward an Empirical Concept of the Guild: The American Education Professoriate, 1963-1967* (San Francisco, Ca.: University of San Francisco—Office of Institutional Studies, 1973. This last was an invitational paper given at the Texas Academy of Science, University of Houston, March 17, 1973).

3. These two studies are: (1) James Steve Counelis, *Tuition Pricing: An Instructional Factors Matrix Approach* (San Francisco, Ca.: University of San Francisco—Office of Institutional Studies, 1972); (2) —, *Theory and Suggested Framework for Self-Evaluative Performance Appraisal in the University* (San Francisco, Ca.: University of San Francisco—Office of Institutional Studies, 1973).

4. *Supra*, p. 182, footnote 2. For an excellent survey of the relation among science, religion, and values, see Ian G. Barbour, *Issues in Science and Religion* (Englewood Cliffs, N.J. Prentice-Hall, Inc., 1966).

5. These NCHEMS lexicons are: (1) Warren W. Gulko, *Program Classification Structure* (1970); (2) James S. Martin, *Data Element Dictionary: Course* (2nd ed., 1972); (3) —, *Data Element Dictionary: Facilities* (2nd ed., 1972); (4) —, *Data Element Dictionary: Finance* (2nd ed., 1972); (5) —, *Data Element Dictionary: Staff* (2nd ed., 1972); (6) —, *Data Element Dictionary: Student* (2nd ed., 1972); (7) W. John Minter, *Higher Education Faculty and Staff Assignment Classification Manual* (Preliminary Field Review Ed., 1971); (8) Leonard C. Romney, *Higher Education Facilities-Inventory and Classification Manual* (Final Review ed., 1972).

6. Bruce M. Russett, et al., *World Handbook of Political and Social Indicators* (New Haven, Conn.: Yale University Press, 1964). See also: Itzhak Galnoor (ed.), *Social Information for Developing Countries: The Annals of the American Academy of Political and Social Science*, Vol. 393 (January 1971).

empirical fact, one must know that Greece is a participant in the Organization for Economic Cooperation and Development and cooperated with Italy, Portugal, Spain, Turkey, and Yugoslavia in the Mediterranean Regional Project. The purpose of this project was to prepare an assessment of educational needs to 1975 and arrive at detailed plans, including financial estimates, for meeting these needs.<sup>1</sup> As a result of this program, a recent committee has made a report in the field of Greek higher education making specific recommendations in the area. Given this environment, permit me to raise some questions leading to possible implications of institutional research for the institutional-level of higher education.

(1) Has Greek Government participation in the OECD's Mediterranean Regional Project generated within the government escalating information needs in all areas of education?

(2) Has the Greek Ministry of Education developed its higher education plans upon the assumption of an empirical economic relationship between education and economic/social development?

(3) At the level of the Ministry of Education information are there requirements for institutional level data which local institutions are incapable of providing?

(4) At the level of the Ministry of Education and at the local institutional level, is higher education planning based upon empirical data from the institutional-level of higher education?

(5) Do the several university-level institutions in Greece recognize today a need for organizational intelligence for institutional self-improvement and rational decision-making?

Whatever the answers to these questions may be, they all «zero in» on organizational intelligence for reality-testing and decision-making.

The degree of readiness of Greek higher education for university-level institutional research will be gauged by the answers given. Thus, the relevance of institutional research for Greek higher education can be established. The organizational need to know is not a function of the system of academic governance practiced. The organizational need to know is a function of the organizational perception of the degree of reality-testing to be necessary for institution health and well being. The chronic existence of institutional crisis is organizational pathology in the university or

college or institute. The pathology is always an atrophied or severed reality-testing feedback system. That is the precise meaning of the term «crisis.»

The time line generating organizational crisis might be long or short. But no organization can survive prolonged crisis. Long-range planning, rational decision-making, and empirically-based organizational intelligence (both systematic and occasional or *ad hoc* organizational intelligence) provide for institutional continuity through reality-testing. Perhaps some form of institutional research at the local level of the university, school, or institute might be relevant. But the assessment of readiness and hence relevance of institutional research for Greek higher education rests with those who know and care.

## Appendix

### BIBLIOGRAPHY

The following bibliography is intended to suggest the comprehensive interdisciplinary scope of the ideas and techniques useful to behavioral science model-building, especially for university institutional research purposes. This bibliography is limited in size and of course biased by the writer's concerns, such bias being used for closure purposes.

JSC

- (1) Richard Atkinson, *et al.*, *An Introduction to Mathematical Learning Theory* (New York: John Wiley and Sons, Inc., 1965).
- (2) Gary S. Becker, *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education* (New York: Columbia University Press/National Bureau of Economic Research, 1964).
- (3) Ludwig von Bertalanffy, *General System Theory: Foundations, Development, Applications* (New York: George Braziller, 1968).
- (4) H. M. Blalock, Jr. (ed.), *Causal Models in the Social Sciences* (Chicago, Ill.: Aldine-Atherton, Inc., 1971).
- (5) M. Blaug, *Economics of Education 1: Selected Readings* (Middlesex, Eng.: Penguin Books Ltd., 1968).
- (6) Benjamin S. Bloom (ed.), *Taxonomy of Educational Objectives: The Classification of Educational Goals—The Cognitive Domain* (New York: Longmans, Green and Company, 1956).
- (7) J. M. Bochenski, *The Methods of Contemporary Thought* (New York: Harper and Row, 1968).
- (8) Samuel Bowles, *Planning Educational Systems for Economic Growth* (Cambridge, Mass.: Harvard University Press, 1969).
- (9) Walter Buckley (ed.), *Modern Systems Research for the Behavioral Scientist: A Sourcebook* (Chicago, Ill.: Aldine Publishing Company, 1968).
- (10) Walter Buckley, *Sociology and Modern Systems Theory* (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1967).
- (11) Mario Bunge, *Scientific Research I: The Search for System* (New York: Springer-Verlag New York, Inc., 1967).

1. For an evaluation of the work of the Greek development effort in education, see: Samuel Bowles, *Planning Educational Systems for Economic Growth* (Cambridge, Mass.: Harvard University Press, 1969), Ch. 5. For an interesting set of papers in American state-wide planning, see: Lyman A. Glenny and George B. Weathersby (eds.), *Statewide Planning for Postsecondary Education: Issues and Design* (Boulder, Ca.: NCHEMS, 1971).



- (12) Mario Bunge, *Scientific Research II: The Search for Truth* (New York: Springer-Verlag New York, Inc., 1967).
- (13) Rocco Carzo, Jr. and John N. Yanouzas, *Formal Organization: A Systems Approach* (Homewood, Ill.: Richard D. Irwin, Inc./The Dorsey Press, 1967).
- (14) Yuen Ren Chao, *Language and Symbolic Systems* (Cambridge at the University Press, 1968).
- (15) Colin Cherry, *On Human Communication: A Review, A Survey, and A Criticism* (2nd ed., Cambridge, Mass.: The MIT Press, 1967).
- (16) James S. Coleman, *Introduction to Mathematical Sociology* (Glencoe, Ill.: The Free Press, 1964).
- (17) Charles M. Doller and Richard J. Jensen, *Historian's Guide to Statistics: Quantitative Analysis and Historical Research* (New York: Holt, Rinehart, and Winston, Inc., 1971).
- (18) Karl A. Fox (ed.), *Economic Analysis for Educational Planning: Resource Allocation in Non-Market Systems* (Baltimore, Md.: The Johns Hopkins University Press, 1972).
- (19) Robert M. Gagne, *The Conditions of Learning* (New York: Holt, Rinehart, and Winston, Inc., 1965).
- (20) Bernard R. Gelbaum and James G. March, *Mathematics for the Social and Behavioral Sciences: Probability, Calculus, and Statistics* (Philadelphia, Pa.: W.B. Saunders Company, 1969).
- (21) Barney G. Glaser and Anselm L. Strauss, *The Discovery of Grounded Theory: Strategies for Qualitative Research* (Chicago, Ill.: Aldine Publishing Company, 1967).
- (22) Daniel E. Griffiths (ed.), *Developing Taxonomies of Organizational Behavior in Educational Administration* (Chicago, Ill.: Rand McNally and Company, 1969).
- (23) Harold Guetzkow, et al., *Simulation in Social and Administrative Science: Overviews and Case-Examples* (Englewood, Cliffs, N.J.: Prentice-Hall, Inc., 1972).
- (24) Mason Haire (ed.), *Modern Organizational Theory: A Symposium of the Foundations for Research in Human Behavior* (New York: John Wiley and Sons, Inc., 1959).
- (25) Anita J. Harrow, *A Taxonomy of the Psychomotor Domain: A Guide for Developing Behavioral Objectives* (New York: David McKay Company, Inc., 1972).
- (26) Mary B. Hesse, *Models and Analogies in Science* (Notre Dame, Md.: University of Notre Dame, 1966).
- (27) Ernest R. Hilgard (ed.), *Theories of Learning and Instruction: The Sixty-third Yearbook of the National Society for the Study of Education* (Chicago, Ill.: The University of Chicago Press, 1964).
- (28) David S. P. Hopkins, «On the Use of Large-Scale Simulation Models for University Planning.» *The Review of Educational Research*, Vol. XL, No. 5 (December 1971), pp. 467-478.
- (29) Gwilym M. Jenkins and Donald G. Watts, *Spectral Analysis and Its Application* (San Francisco, Ca.: Holden-Day, 1968).
- (30) Bruce Joyce and Marsha Weil, *Models of Teaching* (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1972).
- (31) Abraham Kaplan, *The Conduct of Inquiry: Methodology for Behavioral Science* (San Francisco, Ca.: Chandler Publishing Company, 1964).
- (32) Georg Karlsson, *Social Mechanisms: Studies in Sociological Theory*, (Glencoe, Ill.: The Free Press, 1958).
- (33) Arnold Kaufmann, *The Science of Decision-making: An Introduction to Praxeology*, translated by Rex Audley (New York: McGraw-Hill Book Company/World University Library, 1968).
- (34) John G. Kemeny and J. Laurie Snell, *Mathematical Models in the Social Sciences* (Boston, Mass.: Ginn and Company, 1962).
- (35) John G. Kemeny, et al., *Introduction to Finite Mathematics* (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1956).
- (36) J. W. Kling, et al., *Woodworth and Schlosberg's Experimental Psychology* (3rd ed., New York: Holt, Rinehart and Winston, Inc., 1971).
- (37) David R. Krathwohl, et al., *Taxonomy of Educational Objectives: The Classification of Educational Objectives—The Affective Domain* (New York: David McKay Company, Inc., 1956).
- (38) Ervin Laszlo, *System, Structure and Experience: Toward a Scientific Theory of Mind* (New York: Gordon and Beach Science Publishers, 1969).
- (39) J. R. Lawrence (ed.), *Operational Research and the Social Sciences* (London: Tavistock Publications, 1966).
- (40) Paul F. Lazarsfeld and Neil W. Henry, *Readings in Mathematical Social Science* (Chicago, Ill.: Science Research Associates, Inc., 1966).
- (41) Bernard J. F. Lonergan, S.J., *Insight: A Study in Human Understanding* (3rd ed., New York: Philosophical Library, 1970).
- (42) R. Duncan Luce (ed.), *Developments in Mathematical Psychology* (Glencoe, Ill.: The Free Press, 1960).
- (43) Donald M. MacKay, *Information, Mechanism, and Meaning* (Cambridge, Mass.: The MIT Press, 1969).
- (44) William P. McEwen, *The Problem of Social-Scientific Knowledge* (Totowa, N.J.: The Bedminster Press, 1963).
- (45) James F. McNamara, «Mathematical Programming Models in Educational Planning.» *The Review of Educational Research*, Vol. XL, No. 5 (December 1971), pp. 419-446.
- (46) James G. March (ed.), *Handbook of Organizations* (Chicago, Ill.: Rand McNally and Company, 1965).
- (47) James G. March and Herbert A. Simon, *Organizations* (New York: John Wiley and Sons, Inc., 1958).
- (48) Fred Massarik and Philburn Ratoosh (eds.), *Mathematical Explorations in the Behavioral Sciences* (Homewood, Ill.: Richard D. Irwin, Inc./The Dorsey Press, 1965).
- (49) James Maynard, *Some Microeconomics of Higher Education: Economics of Scale* (Lincoln, Neb.: The University of Nebraska Press, 1971).
- (50) Thomas H. Naylor, et al. *Computer Simulation Techniques* (New York: John Wiley and Sons, Inc., 1968).
- (51) Organization of Economic and Cooperative Development, *The Residual Factor and Economic Growth* (Paris: OECD, 1964).
- (52) Organization of Economic and Cooperative Development, *Efficiency in Resource Utilization in Education* (Paris: OECD, 1967).
- (53) Organization of Economic and Cooperative Development, *Mathematical Models in Educational Planning* (Paris: OECD, 1967).
- (54) Talcott Parsons and Edward A. Shils (eds.), *Toward a General Theory of Action* (Cambridge, Mass.: Harvard University Press, 1959).
- (55) Phi Delta Kappa National Study Committee on Evaluation, *Educational Evaluation and Decision-making* (Itasca, Ill.: F. E. Peacock, Publishers, Inc., 1971).
- (56) Jean Piaget, *Structuralism*, translated by Chaninah Maschler (New York: Harper and Row, Publishers, 1968).
- (57) William S. Sahakian, *Psychology of Learning: Systems, Models, and Theories* (Chicago, Ill.: Markham Publishing Company, 1970).
- (58) Clarence Scheps and E. E. Davidson, *Accounting for Colleges and Universities* (Rev. ed., Baton Rouge, La.: Louisiana State University, 1970).
- (59) Alfred Schutz, *The Phenomenology of the Social World*, translated by George Walsh and Frederick Lehnert (Evanston, Ill.: Northwestern University Press, 1967).



- (60) Martin Shubik (ed.), *Game Theory and Related Approaches to Social Behavior: Selections* (New York: John Wiley and Sons, Inc., 1964).
- (61) Jagjit Singh, *Great Ideas in Information Theory, Language and Cybernetics* (New York: Dover Publishers, Inc., 1966).
- (62) James R. Slagle, *Artificial Intelligence: The Heuristic Programming Approach* (New York: McGraw-Hill Book Company, 1971).
- (63) John A. Sonquist, *Multivariate Model Building: The Validation of a Search Strategy* (Ann Arbor, Mich.: The University of Michigan/Institute for Social Research, 1970).
- (64) Ralph M. Stogdill (ed.), *The Process of Model-Building in the Behavioral Sciences* ([Columbus, O.]: Ohio State University Press, 1970).
- (65) Jan Tinbergen and H. O. Bos (eds.), *Econometric Models of Education: Some Applications* (Paris: OECD, 1965).
- (66) James R. Topping and Glenn K. Miyataki, *Program Measures* (Boulder, Co.: National Center for Higher Education Management Systems, 1973).
- (67) Robert M. W. Travers (ed.), *Second Handbook of Research on Teaching* (Chicago, Ill.: Rand McNally and Company, 1973).
- (68) Merle B. Turner, *Philosophy and the Science of Behavior* (New York: Appleton-Century-Crofts, 1967).
- (69) Norbert Wiener, *Cybernetics: Or Control and Communication in the Animal and the Machine* (2nd ed., Cambridge, Mass.: The MIT Press, 1961).
- (70) Gordon Ziemer, et al., *Cost Finding Principles and Procedures* (Boulder, Co.: National Center for Higher Education Management Systems, 1971).

Every thinker tries to select his own intellectual past, and is in turn shaped by it... In every generation and in every domain of study, there comes about a general agreement that a small set of works are «classic» in the sense of being somehow indispensable. For by «classic» writers, we do not mean merely those who have been consistently read; we mean also those who, whether read directly or not, have continued to be a point of orientation for the work of others.

C. Wright Mills, *Images of Man*, G. Braziller, 1960.