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AUTHOR Groff, Warren H.
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ABSTRACT

The Programs for Higher Education (PHE) at Nova University (Fort Lauderdale, Florida) developed field-based doctoral programs in higher education, leadership in adult education, and vocational, technical, and occupational education. During the 1980s, PHE critically analyzed the format for the delivery of the specialization seminars for the three programs. PHE decided that the new system should include a learning contract, required units, elective units, participation in the Summer Institute, and a synthesis paper. The first two specialization seminars to be modified were in the vocational, technical, and occupational education program; they are: Personnel-Human Resources Development and The Emergence of Vocational, Technical, and Occupational Education in America. Doctoral students in the Vocational, Technical, and Occupational Education program are, for the most part, pragmatic managers and pragmatic humanists. The exercise to create alternative scenarios of the future was a rewarding experience for the participants and a necessity if the program is to produce transformational leaders, agents of change. The synthesis papers have become qualitatively better over the years. Each student completing the two specialization seminars demonstrated marked improvement during the second seminar, regardless of the sequence in which they took the courses. (Data tables are appended.) (YLB)

PREPARING TRANSFORMATIONAL LEADERS IN VOCATIONAL, TECHNICAL, AND OCCUPATIONAL EDUCATION

by

Warren H. Groff, Ed.D.
Dean of Academic Affairs
Shelby State Community College
Memphis, TN 38174

Abstract

The ultimate goal of graduate education is to design programs of preparation to promote improvement in the quality of education and training services that are provided in a variety of different contexts. In the 1960s, Nova University developed the field-based doctoral program as a strategy to prepare individuals to become agents of change in the contexts in which they work. The Programs for Higher Education developed field-based doctoral programs in (1) higher education; (2) leadership in adult education; and (3) vocational, technical, and occupational education. During the 1980s, the Programs for Higher Education critically analyzed the format for the delivery of the specialization seminars for the three above-named programs. This paper describes the redesign and implementation of the new format for developing transformational leaders in vocational, technical and occupational education.

The biggest "infrastructure" challenge for this country in the next decade is not the billions needed for railroads, highways and energy, but the American school system, from kindergarten through Ph.D. program and the post-graduate education of adults. And the challenge requires something far scarcer than money - thinking and risk-taking.

Peter F. Drucker, "The Coming Changes In Our School Systems," The Wall Street Journal, March 3, 1981.

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> We are beginning to understand how to educate for renewal but we must deepen that understanding. If we indoctrinate the young person in an elaborate set of fixed beliefs, we are ensuring his early obsolescence. The alternative is to develop skills, attitudes, habits of mind and the kinds of knowledge and understanding that will be the instruments of continuous change and growth on the part of the young person. Then we will have fashioned a system that provides for its own continuous renewal. (Gardner 1963).

I. Introduction

The ultimate goal of graduate education is to design programs of preparation to promote improvement in the quality of education and training in order to develop in graduate students the competencies and skills necessary for people to carry out a role that society has deemed necessary for its well-being. In order to achieve that goal, persons with extensive background and experience engage in research about the preparation of professionals and the contexts in which they work. They then translate that research into graduate programs to assist persons to attain a high level of proficiency in order to provide statesman-like leadership to institutions of society. Some institutions also provide post-doctoral continuing education programs that assist persons to maintain and to improve essential leadership skills.

Professional graduate education is in the earliest stages of becoming a genuine science. It depends on and borrows heavily from other fields such as psychology, sociology, management science, law, and a broad range of disciplines. Furthermore, professional graduate education occurs as a result of a philosophy and conceptual framework which is the elongated shadow of the values and background of a group of full-time and part-time experienced professional educators. They attempt to assemble the curriculum -- a mosaic of content, methods for delivering that body of knowledge, and techniques for assessing the acquisition of competencies and skills by students.

II. The Emergence of Nontraditional Graduate Education Programs

When the Sputniks were launched in 1957, many sectors of the education and training industry began to examine their mission and role. Several traditional institutions began to review their programs, including content formats, delivery system formats, and formats for evaluating student competencies. The criticisms about education, particularly at the undergraduate and graduate levels, also gave birth to a number of non-traditional programs. It was in this context that Nova University was founded in 1964.

It is helpful to use a systems approach with the categories of input, process, and outcomes in contrasting traditional and non-traditional programs. Inputs in both types of programs include students and context. In traditional campus-based programs the students tend to be in the early years of their professional careers and from rather similar contexts. The process tends to be primarily on didactic instruction with emphasis on theory and research, sometimes to the exclusion of practical application. The intended outcome is to produce researchers, professors, or practitioners. In the Nova University field-based programs, the students tend to be in the middle years of their professional careers and serve as practitioners in different contexts. The process includes some didactic instruction with emphasis on theory and research with extensive application through five practicums and a Major Applied Research Project. The program and delivery system is described more fully in the following sections. The intended outcome is to produce qualitative superior practitioners who can carry on a safe practice of managing their unit and who are aware of what is required to become agents of social change.

Since its beginning, Nova University designed and implemented innovative approaches which provide nontraditional choices for a broad range of students.

In 1971, the university developed its first field-based program for practicing elementary- and secondary-level school administrators. This National Ed.D. Program for Education Leaders is currently being offered to candidates in 17 states through the Center for School Leadership Development.

In 1972, the university developed the Ed.D. program for community college personnel. This program led to the development of the Center for Higher Education which will be described briefly in the next section.

In 1974, the university developed the Ed.D. program in early and middle childhood. This program is offered through the Center for the Advancement of Education which is dedicated to assisting teachers, counselors, trainers, administrators, and other persons working in education and health and human service professions.

III. The Programs for Higher Education

The Programs for Higher Education provides a field-based Doctor of Education (Ed.D.) program for practitioners working in three specialized areas: (1) higher education; (2) leadership in adult education; and (3) vocational, technical, and occupational education. Many students enrolled in these programs are employed in secondary adult and vocational education, postsecondary education, business and industry, the health care delivery system, and military training. The center uses a field-based delivery format in combining instruction, independent study, and applied research.

Students are required to complete seven seminars, five practicums, and a major applied research project (MARP). Five of the seven seminars are core seminars that are required for all students regardless of specialization. The core seminars are: (1) Curriculum and Program Planning, (2) Governance and Management, (3) Applied Educational Research and Evaluation, (4) Learning

Theory and Applications, and (5) Societal Factors Affecting Education. Two are specialization seminars that are taken only by those students who have chosen that specialization. The specialization seminars are as follows:

Higher Education

1. The Politics, Law, and Economics of Higher Education.
2. The Emergence of Higher Education in America.

Leadership in Adult Education

1. History, Philosophy, and Nature of Adult Education.
2. The Theory and Practice of Adult Education Methodology.

Vocational, Technical, and Occupational Education

1. Personnel - Human Resources Development.
2. The Emergence of Vocational, Technical, and Occupational Education in America.

Practicums are applied research projects that are designed to promote the solution to current problems in the establishment in which the student works. Practicums are highly structured opportunities to put theory into practice and to apply newly acquired knowledge and skills to the reality of the workplace. Students must successfully complete five practicums, one of which must be in a specialization seminar.

MARP's are much like practicums, only much more ambitious and rigorous. The MARP is the capstone to doctoral study.

The integrated program of study is designed so that it can be completed in approximately three years. Normally, students attend one seminar per quarter. Three sessions are held for each seminar. Practicums are undertaken after the completion of the seminar. The MARP is undertaken after the completion of seminars and practicums.

Students are organized into groups called clusters. Clusters provide the vehicle through which instruction and other services are provided to students. Cluster coordinators, professional educators who serve as local representatives of Nova University, manage all activities and services at the local level. During the first two nine-month academic years, formal instruction is offered by national lecturers during three three-month terms. National lecturers travel to the cluster sites for seminar meetings. The specialization seminars are delivered in a new format which is described in the section which follows.

IV. The New Delivery System Format

Discussion about alternative ways to deliver the specialization seminars occurred throughout the early 1980s. These discussions became more focused in the spring of 1983. During the summer of 1983, a commitment was made to convene a meeting of national lecturers (1) to develop the conceptual framework for the new delivery system format, (2) to identify the components that would be included in the new delivery system, (3) to discuss alternative ways to design the various components, and (4) to establish the time-line for implementing the new delivery system.

These discussions included a review of research about adult learning and components that would be a part of the new delivery system format. Ultimately the national lecturers decided the new system should include the following components: (a) a learning contract, (b) required units, (c) elective units, (d) participation in the Summer Institute, and (e) a synthesis paper.

Specialization seminar materials were developed or modified during the fall of 1983 and winter of 1984. These materials were distributed to students in March 1984. Specialization seminars offered through this new format in 1984 were as follows:

Higher Education	- The Politics, Law, and Economics of Higher Education - The Emergence of Higher Education in America
Adult Education	- History, Philosophy, and Nature of Adult Education
VTO Education	- Personnel - Human Resources Development

Specialization seminars offered through this new format in 1985 were as follows:

Higher Education	- The Politics, Law, and Economics of Higher Education - The Emergence of Higher Education in America
Adult Education	- Theory and Practice of Adult Education Methodology
VTO Education	- The Emergence of VTO Education in America

The 1984 cycle was repeated in 1986 and the 1985 cycle was repeated in 1987.

V. The Vocational, Technical, and Occupational Education Program

The program in vocational, technical, and occupational education consists of the five core seminars and two specialization seminars: (1) Personnel - Human Resources Development and (2) The Emergence of Vocational, Technical, and Occupational Education In America.

A. Personnel - Human Resources Development (P-HRD)

Because humans are the most important resource any establishment has, it was decided to modify P-HRD first to the new format. During the fall of 1983, national lecturers made modifications to study guides and developed other materials to run the first series of specialization seminars in 1984. In the case of P-HRD the following materials were developed: (1) Contract Packet, (2) Study Guide, and (3) Synthesis Paper Guide. The Study Guide contained the following units:

1. Changing Nature of Society
2. Stages of Human Development
3. Linking HRD to Organizational Development

4. HRD in the Technical Society Based on Information
5. Use of Resources in the Personnel Function
6. Organization and Administration of the HRD Function
7. Legal Aspects of the HRD Function
8. Student Personnel Function
9. Leadership in Human Resources Development

These materials were distributed to students in March 1984.

Students were asked to read the Contract Packet, Study Guide, and Synthesis Paper Guide. Students were then required to negotiate a learning contract for the three required and two elective units. Units 1, 2, and 3 were required in P-HRD. Unit 1 deals with the transition from an industrial society to a technical society based on the use of information and the implications for the HRD function. Unit 2 deals with stages of human growth and development and the implications for HRD. Unit 3 deals with stages of organizational development and the implications for HRD.

The Summer Institute began on Sunday, July 28, 1984 with students reporting on their required and elective units. During the week the students completed an analysis that pulled together the significant concepts and implications for each unit. Throughout the week individual counseling sessions were held between the national lecturer and students to discuss a broad range of program-related ideas. Students also completed an analysis of significant ideas learned from attending sessions at the Summer Institute. On Saturday, August 4, the group met to discuss the synthesis paper due on October 1, 1984.

B. The Emergence of Vocational, Technical, and Occupational Education In America (E-VTO)

During the fall of 1984, the national lecturers conducted a formative evaluation of the implementation of the first year of the new delivery system. In addition, national lecturers made modifications to study guides and developed other materials to run a second series of specialization seminars in 1985. In the case of E-VTO, the following materials were developed: (1) Contract Packet, (2) Study Guide, (3) Synthesis Paper Guide. The Study Guide contained the following units:

1. Evolution of VTO Education In America.
2. Vocational Education In the Industrial Society.
3. Redesign of the Education System.
4. The Emergence of the Technical Society.
5. Economic Development and Revitalization.
6. Studies About Education.
7. Intellectual Capital Formation.

Videotapes were developed that provided the national lecturer an opportunity to explain the new delivery system format for each specialization seminar. The above-mentioned materials were distributed to students and the one-half hour tapes were circulated among clusters during March 1985.

Students were asked to view the tape and then read the Contract Packet, Study Guide, and Synthesis Paper Guide. Students were then required to negotiate a learning contract with the national lecturer for the three required and two elective units. Units 3, 4, and 6 were required in E-VTO. Unit 3 deals with the redesign of the education system that resulted immediately after the launching of the Sputniks. Unit 4 deals with the transition from an -

industrial society to a technical society based on the exchange of ideas and information. Unit 6 deals with the latest series of studies about education and the current wave of the redesign and restructuring of the education and training industry. The two elective assignments could be taken from any of the four remaining units or by writing a double paper for Unit 7. In addition, a student could obtain academic credits for prior learning experience by submitting a portfolio of material that meets requirements set by the national lecturer.

After completing the required and elective units, students were required to review their work and complete an analysis that pulled together the significant concepts and implications of each unit. Each student xeroxed multiple copies for distribution to the 15 participating students at their first meeting at the Summer Institute on Sunday afternoon.

The Summer Institute began on Sunday, August 4, 1985 with each student presenting an analysis of required and elective units. This process was continued on Monday, August 5, immediately after the opening session on "Outcomes" and the panel reaction to the opening session. As a way of emphasizing diversity and individualization, participants were asked to complete a learning styles inventory by Kolb, Rubin, and McIntyre and a hemisphericity instrument by Torrance, Reynolds, Riegel and Ball. The learning styles inventory provides scores for four preferences labeled (1) concrete experience, (2) reflective observation, (3) abstract conceptualization, and (4) active experimentation. The hemisphericity instrument yields a score for the right hemisphere preference, the left hemisphere preference, and the integrated preference. Throughout the week individual counseling sessions were held between the national lecturer and students to discuss a broad range of

program-related items including practicums and MARPs. Students also completed an analysis of significant ideas learned from attending sessions at the Summer Institute. On Saturday, August 10, the group met to discuss the synthesis paper which was due on October 1, 1985. The specialization seminar format is displayed in FIGURE 1.

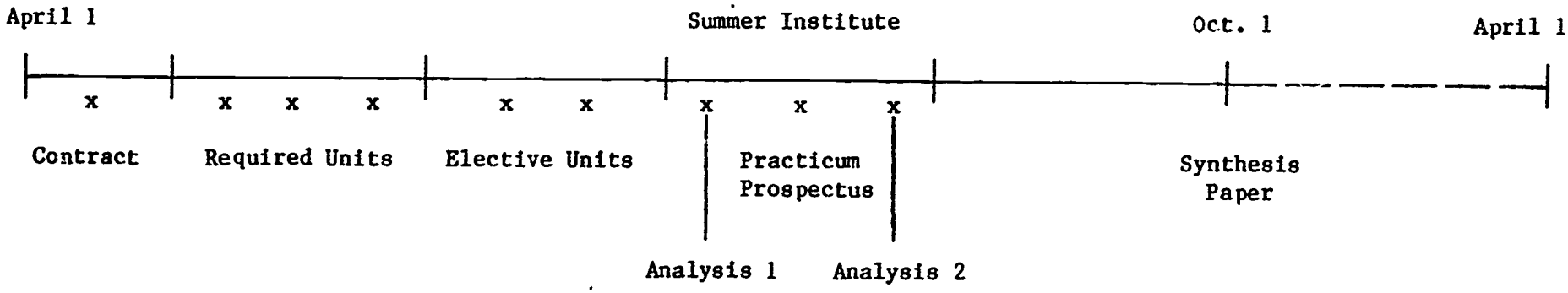
Cycle 1 consisted of offering P-HRD in 1984 and E-VTO in 1985. An analysis of cycle 1 was published in 1986 (Groff 1986). Cycle 1 could be referred to as "getting started." Cycle 2 consisted of offering P-HRD in 1986 and E-VTO in 1987. Cycle 2 could be referred to as "refining process and structure." Qualitative improvements were made in several areas: (1) pre summer institute, (2) summer institute, (3) synthesis experience, and (4) follow-up activities. One addition to the Summer Institute included taking the Myers Briggs instrument and participating in exercises to create alternative scenarios of the future. A multi-year plan is displayed in FIGURE 2.

VI. Analysis of Outcomes

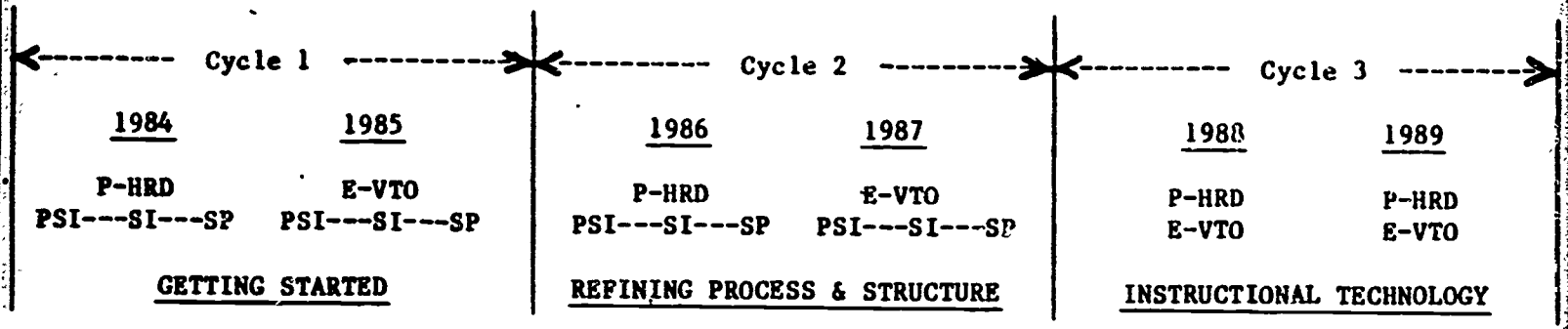
The National Center for Higher Education Management Systems divides outcomes into output and impact. This discussion will focus on process leading to output of P-HRD and E-VTO. In the next section reference will be made about the relationship of these two specialization areas to the core seminars, practicums, and MARPs. In addition, reference will be made to doctoral program development as it relates to transformational leadership.

Cycle 1. Eight (8) students successfully completed P-HRD in 1984. An analysis of time on task for ten (10) activities indicated a mean of 148 hours with a range from 104 hours to 226 hours. Fifteen (15) students successfully completed E-VTO in 1985. This group included most of the students from P-HRD in 1984. The dominant learning preference for the group was "accomodator"

THE SPECIALIZATION SEMINAR



MULTI-YEAR PLAN FOR VOCATIONAL, TECHNICAL, AND OCCUPATIONAL EDUCATION



1. Pre Summer Institute
   a. Tape
   b. Overview
   c. Study Guide
   d. Synthesis Paper Guide

2. Summer Institute
   a. First Day
   b. Group Sessions
   c. Individual Lessons
   d. Closing Session

3. Synthesis Experience
   a. Individual Growth
   b. Contextual Change

4. Follow-Up Activities
   a. Students
   b. Alumni
   c. Evaluation Report

preference toward active experimentation and concrete experience. Accomodator was followed by converger, diverger, and assimilator. An analysis of time on task for ten (10) activities indicated a mean of 128 hours with a range from 60 hours to 257 hours. The lower mean number of hours is attributable to several factors: (1) students familiarization with the format of the seminar, (2) five students combining the two elective units into one paper, and (3) three students obtaining credit for prior learning. Hours spent attending the Summer Institute are not included in these calculations.

Cycle 2. Twenty five (25) of twenty eight (28) students successfully completed P-HRD in 1986. This group included many of the students from E-VTO in 1985. The dominant learning preferences were accomodator and converger followed by diverger and assimilator. This group was joined by fourteen (14) Chinese students. The dominant learning preferences of the Chinese students in order were converger, assimalotor, accomodator, and diverger. Placement of both groups of students on the Myers Briggs is as follows:

United States

Pragmatic Manager	Strategic Manager
8	6
5	9
Pragmatic Humanist	Strategic Humanist

Chinese

Pragmatic Manager	Strategic Manager
4	4
2	4
Pragmatic Humanist	Strategic Humanist

Students from the United States were distributed throughout the cells in each quadrant while Chinese students were clustered closer to the center of the intersection. An analysis of time on task for twenty-one (21) students indicated a mean of 172 hours with a range from 97 hours to 287 hours.

Twenty four (24) of thirty three (33) eligible students enrolled in E-VTO in 1987. Twenty (20) students successfully completed the requirements for the specialization seminar. This group included many students from P-HRD in 1986 and one student from P-HRD in 1984 who had "stopped out" of the sequence. The dominant learning preferences in order are accomodator, converger, diverger, and assimilator. (FIGURE 3). Placement of students on the Myers Briggs was as follows:

Pragmatic Manager	Strategic Manager
12	3
6	3
Pragmatic Humanist	Strategic Humanist

Students in the pragmatic manager, pragmatic humanist, and strategic humanist categories were distributed throughout the cells in each quadrant. The three students in the strategic manager category all placed along the abscissa or horizontal axis (FIGURE 4). An analysis of time on task for seventeen (17) students indicated a mean of 125 hours with a range from 35 hours to 187 hours.

Over the past four years the required and elective unit papers have improved in quality. The analysis of significant concepts and implications derived from required and elective units has improved; the distribution of these analyses during the first specialization seminar group session contributes a great deal to subsequent learning activities at the Summer Institute. Doctoral students in the VTO program are, for the most part, pragmatic managers and pragmatic humanists. The exercise to create alternative scenarios of the future was a rewarding experience for the participants and a necessity if the program is to produce transformational leaders, agents of

change. The synthesis papers have become qualitatively better over the years. Each student completing the two specialization seminars has demonstrated marked improvement during the second seminar, regardless of the sequence in which they have taken the courses.

No analysis has been made between the relationship between the specialization seminars and the core seminars, between single and multiple participants from a cluster, or between specialization seminars and practicums and MARPS. Furthermore, no study has been made of alumni to obtain feedback about the VTO program and "employer" satisfaction about Nova's VTO product.

VII. Concluding Remarks

The Nova University higher education programs have contributed a great deal to the education and training industry. The mosaic of didactic and application components contributes to the process of preparing persons to carry on a safe practice of "management" in a variety of contexts -- health and human services, business and industry, government and military, and secondary and post-secondary education.

Even though Nova University has made a significant contribution to the society of which it is a part, the programs are still in their infancy in terms of producing "educational revolutionaries." This nation, like most industrial nations, is undergoing a fundamental change, a transformation so profound that it impacts on every aspect of our lives and has tremendous implications for the way we manage our institutions. This nation needs persons who have the competencies and skills that go beyond the safe practice of managing the institutions of society. Our nation needs statesmen-like leaders who can transform our institutions or who can design and create entirely new institutions.

To accomplish the goal of developing transformation leadership, I shall make a distinction between strategic thinking and operational planning.

Strategic thinking and operational planning require two distinct modes of thought. Strategic thinking has a focus on what an organization or group of agencies want to achieve. Strategic thinking should produce a long-term vision of the future based on an analysis of several alternative scenarios and the specification of a preferred scenario. The long-term vision of the 1990s and the 21st Century should be based on an analysis of a broad range of demographic, social, economic, political, technological, and other variables.

Operational planning maps out how that vision will be achieved. Operational planning consists of the interpretation of a preferred scenario into a multi-year action plan with a statement of resource requirements. The first year of the multi-year action plan contains detailed objectives to which fiscal year operating dollars are assigned. The operational plan provides the conceptual framework for organization development and for human resources development and evaluation.

In The Necessary Revolution In American Education, Francis Keppel states:

> The first revolution in American education was a revolution in quantity. Everyone was to be provided the chance for an education of some sort. That revolution is almost won in the schools, and is on its way in higher education. The second revolution is equality of opportunity. That revolution is under way. The next turn of the wheel must be a revolution in quality. Keppel (1966:1)

We must collectively rethink the way in which we prepare leaders for the 1990s and the 21st century. As a nation, we did a reasonably good job during the era of quantitative expansion. We aren't doing as good a job during the equality of opportunity revolution. We made some initial gains but now the data suggest that those increments of growth are being lost. The early signs

about the efforts to superimpose mandates to improve the quality of the education and training of industry on the industrial model of "schooling" has produced mixed results. We have created more bureaucratic hurdles in the industrial model which is causing higher levels of drop out and stop out rates.

The current education reform movement acknowledges the enormous primacy of education and training - learning is the capital forming industry of an advanced society. If we are to be the beneficiaries of the technical society, we must rethink the way we manage the learning tasks of an advanced technical society and redesign our institutions to fit the new learning paradigms.

As a first step we must develop a vision of the 1990s and the 21st century and anticipate how the learning tasks of an advanced technical society should be organized. As a second step, we must critically analyze the philosophy and mission of the nontraditional program and speculate about the role a nontraditional program will possibly play in the advanced technical society. Third, we must then examine the inputs, process, and outcomes of our nontraditional program. The focus of institutions is inextricably tied to adult and continuing education, lifelong learning, and is very much dependent upon the attributes of the independent, self-directed learner.

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APPENDICES

* Chinese Students

FIGURE 1
LEARNING PREFERENCES, P-HRD, 1986

AMERICAN STUDENTS	CE	RO	AC	AE	R	L	I	E	I	S	N	T	F	P	J
A	16	13	16	15	26	8	6	3	4	1	6	3	4	1	6
B	13	16	21	13	5	7	28	0	6	2	5	3	4	3	5
C	19	6	13	18	15	15	10	6	0	2	6	3	7	4	3
D	8	10	23	19	16	18	6	2	5	1	6	5	1	0	7
E	14	14	14	18	10	17	17	4	3	4	3	4	2	2	3
F	19	10	12	22	13	13	14	2	5	7	1	2	5	2	4
G	8	13	22	20	21	13	6	2	5	6	1	5	2	0	6
H	13	16	23	13	10	13	17	6	1	2	7	4	2	5	3
I	13	20	15	14	12	16	12	3	4	8	0	5	2	0	7
J	13	10	20	17	12	18	10	3	4	4	4	6	1	2	4
K	16	14	22	14	16	6	18	0	7	2	7	2	5	4	2
L	18	9	14	20	9	17	14	6	1	8	0	3	2	1	5
M	13	15	20	19	4	11	25	7	0	6	2	2	4	2	5
N	13	11	21	15	8	4	28	3	4	2	6	3	5	5	3
O	18	16	16	15	10	3	27	5	2	3	5	3	4	1	5
P	13	11	19	21	8	10	21	4	3	7	1	0	7	5	1
Q	13	19	14	10	8	15	17	1	6	3	3	4	4	1	7
R	17	12	17	16	17	10	13	3	4	7	1	3	3	2	6
S	11	11	22	21	8	10	22	7	0	1	6	4	2	0	7
T	11	7	18	22	9	8	23	4	3	3	4	5	4	0	7
U	13	8	17	21	5	13	22	3	4	5	4	4	4	6	1
V	20	7	12	21	13	7	20	7	0	0	8	0	7	6	0
W	16	20	16	20	2	13	25	2	5	3	4	2	5	3	5
X	15	14	14	16	6	17	17	2	5	6	2	6	1	2	6
Y	12	18	13	12	14	15	11	5	1	8	0	4	3	5	2
Z	21	11	11	19	22	11	7	5	2	7	0	5	3	1	3
a	16	14	21	16	9	11	19	6	0	2	3	3	1	2	4

	CE	RC	AC	AE	R	L	I	E	I	S	N	T	F	P	J
6	10	9	22	16	6	15	19	6	1	1	7	2	5	1	6
HIGH	21	20	23	22	26	18	28								
LOW	8	6	11	10	2	3	6								
MEAN	14.6	12.9	17.4	17.1	10.7	11.8	17.2								

FIGURE 2

CHINESE LEARNING PREFERENCES, P-H20, 1986

CHINESE STUDENTS	CE	RC	AC	AE	R	L	I	E	I	S	N	T	F	P	J
A	15	14	17	17	19	8	13	3	4	4	4	2	4	3	3
B	17	10	14	20	7	10	23	4	3	4	4	5	2	1	5
C	14	17	19	18	9	16	15	5	2	4	3	4	2	2	5
D	17	18	15	10	13	15	12	3	4	4	3	3	4	4	2
E	13	16	10	16	10	21	9	1	5	2	3	2	2	1	5
F	15	15	21	15	10	16	14	4	3	7	1	4	3	0	6
G	11	17	20	20	10	28	2	3	4	6	2	5	2	0	7
H	15	15	14	24	9	8	23	4	2	2	6	4	4	2	3
I	14	15	22	15	15	18	7	6	1	5	3	5	1	0	5
J	14	12	20	20	17	13	10	2	5	4	4	5	2	3	3
K	17	14	13	16	7	19	14	6	1	5	3	3	5	1	6
L	12	18	16	18	24	14	2	4	3	3	6	4	2	1	5
M	14	15	23	14	15	20	5	3	4	4	4	1	5	3	4
N	14	13	10	19	12	8	20	4	3	4	4	4	4	0	5
HIGH	17	18	23	24	24	28	23								
LOW	11	10	10	10	7	8	2								
MEAN	14.4	14.9	16.7	17.3	12.6	15.3	12.8								

FIGURE 2

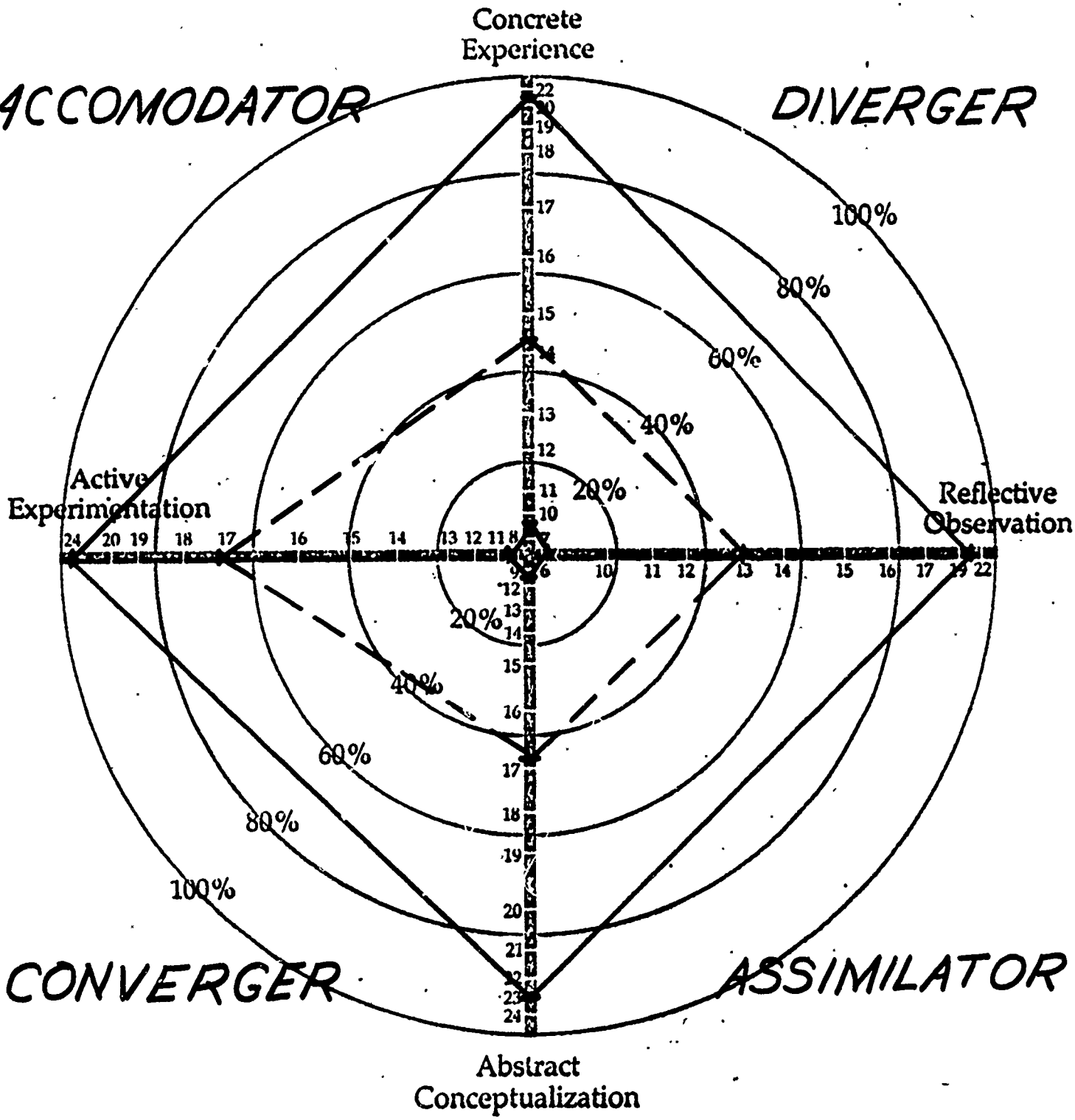
TIME ON TASK, P-HRD, 1986

STUDENTS

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	a	b	RANGE	M
1. Hours spent reviewing the Overview, Study Guide, Synthesis Paper.																													
2	2		5	4	2	8	12	4	11	10	5			3	6			10	8	10		4	11	12	19		6	2-14	7.7
2. Hours spent in developing the learning contract.																													
15	8		17	22	8	20	36	8	11	20	15			18	2			32	18	18		22	9	30	25		35	2-36	18.6
3. Hours spent completing 1st required unit.																													
10	10		12	20	8	15	48	10	11	20	15			16	10			25	12	14		18	7	18	23		20	7-48	16.3
4. Hours spent completing 2nd required unit.																													
20	10		10	8	8	15	48	10	11	20	14			15	11			28	16	18		12	11	22	22		24	8-48	16.7
5. Hours spent completing 3rd required unit.																													
15	5		12	10	8	10	40	10	11	20	12			12	12			35	12	17		15	13	15	20		4	5-40	14.5
6. Hours spent completing 1st elective unit.																													
15	10		11	9	8	10	25	8	2	20	12			12	12			30	13	16		10	12	15	25		40	2-90	14.8
7. Hours spent completing 2nd elective unit.																													
5	2		14	10	4	2	4	50	3	50	5			4	6			12	3	20		5	35	3	19		10	2-50	12.6
8. Hours spent analyzing 3 required and 2 elective units.																													
39	40		47	30	35	10	45	40	35	62	18			42	27			32	9	37		25	16	27	48		35	9-47	33.7
9. Hours spent analyzing summer institute.																													
10	10		35	12	8	38	11	10	12	4	5			7	10			10	36	11		10	7	10	12		25	4-38	14
10. Hours spend writing synthesis paper.																													
20	32		30	40	8	26	15	12	32	30	10			30	25			25	24	30		35	22	26	18		10	10-40	24.1
Total																													
151	129		193	165	97	154	269	162	195	256	111			159	103			239	153	191		156	143	178	227		97	97-287	17

LEARNING STYLE PROFILE

Norms for the Learning Style Inventory



P-HRD. 1986

AMERICAN

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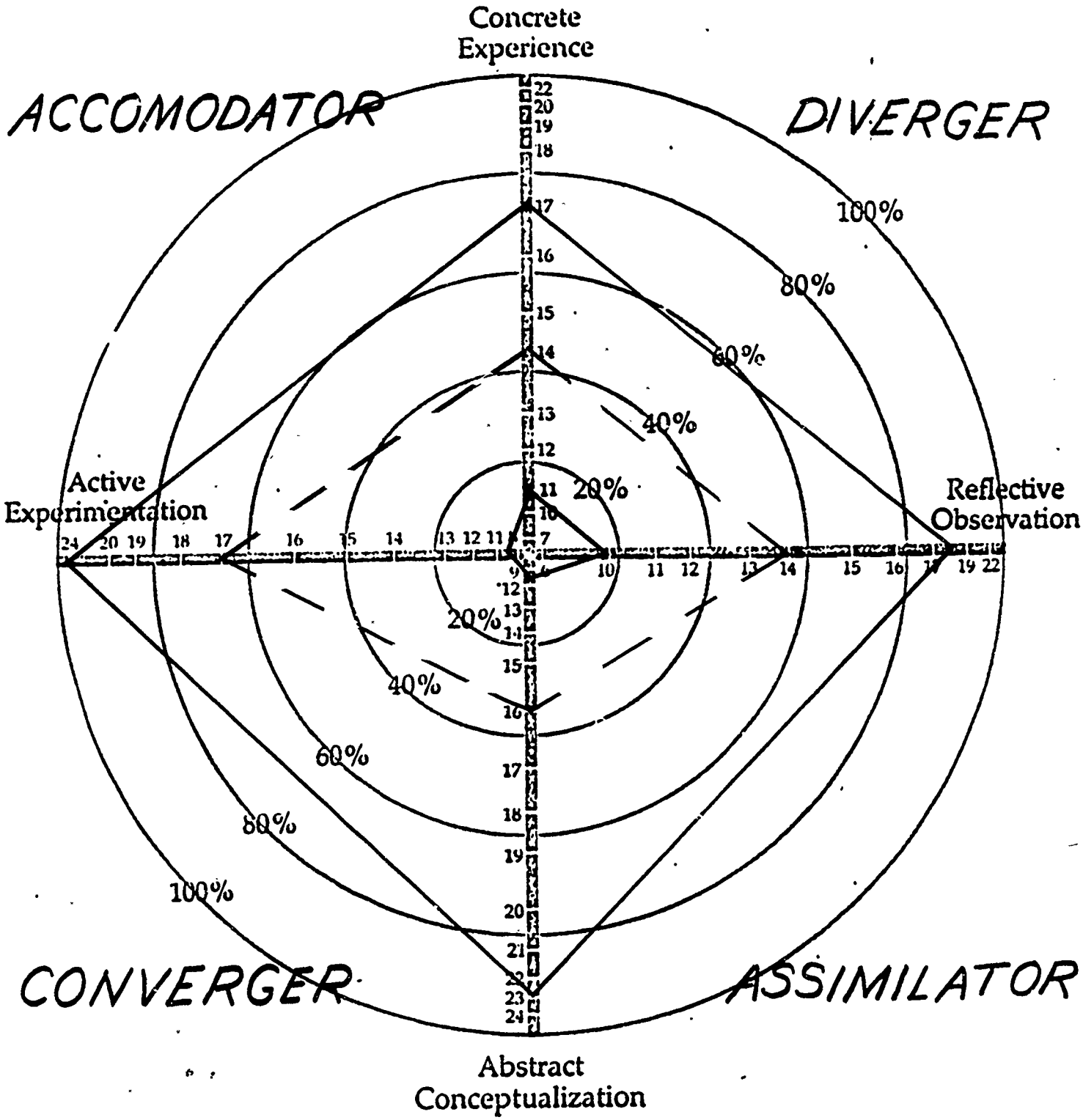
LEARNING STYLE PROFILE

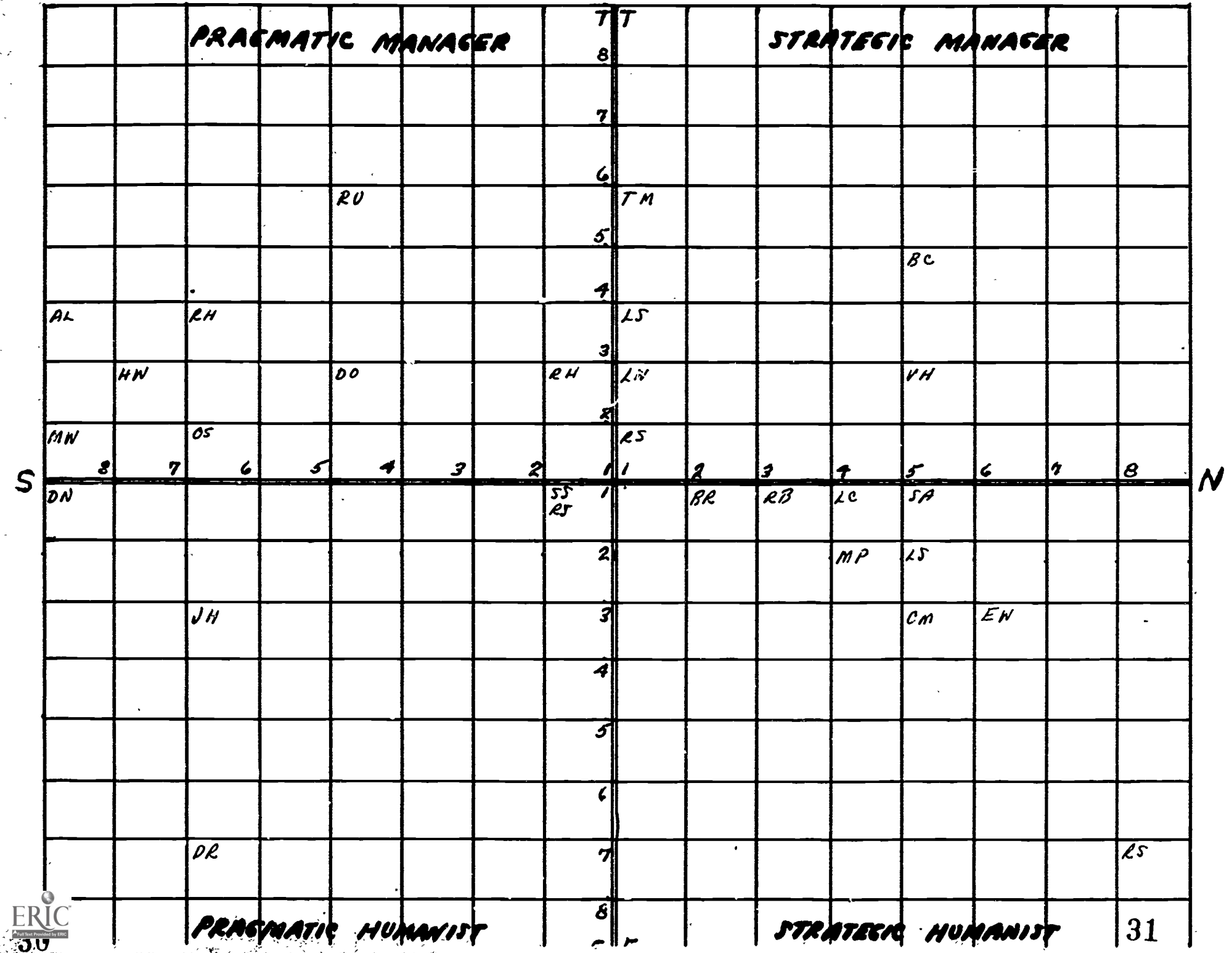
Norms for the Learning Style Inventory



P-HRD, 1986

CHINESE

MYERS BRIGGS PLANNING STYLES, P-HRD, 1986, AMERICAN



MYERS BRIGGS PLANNING STYLES, P-HRD, 1986, CHINESE

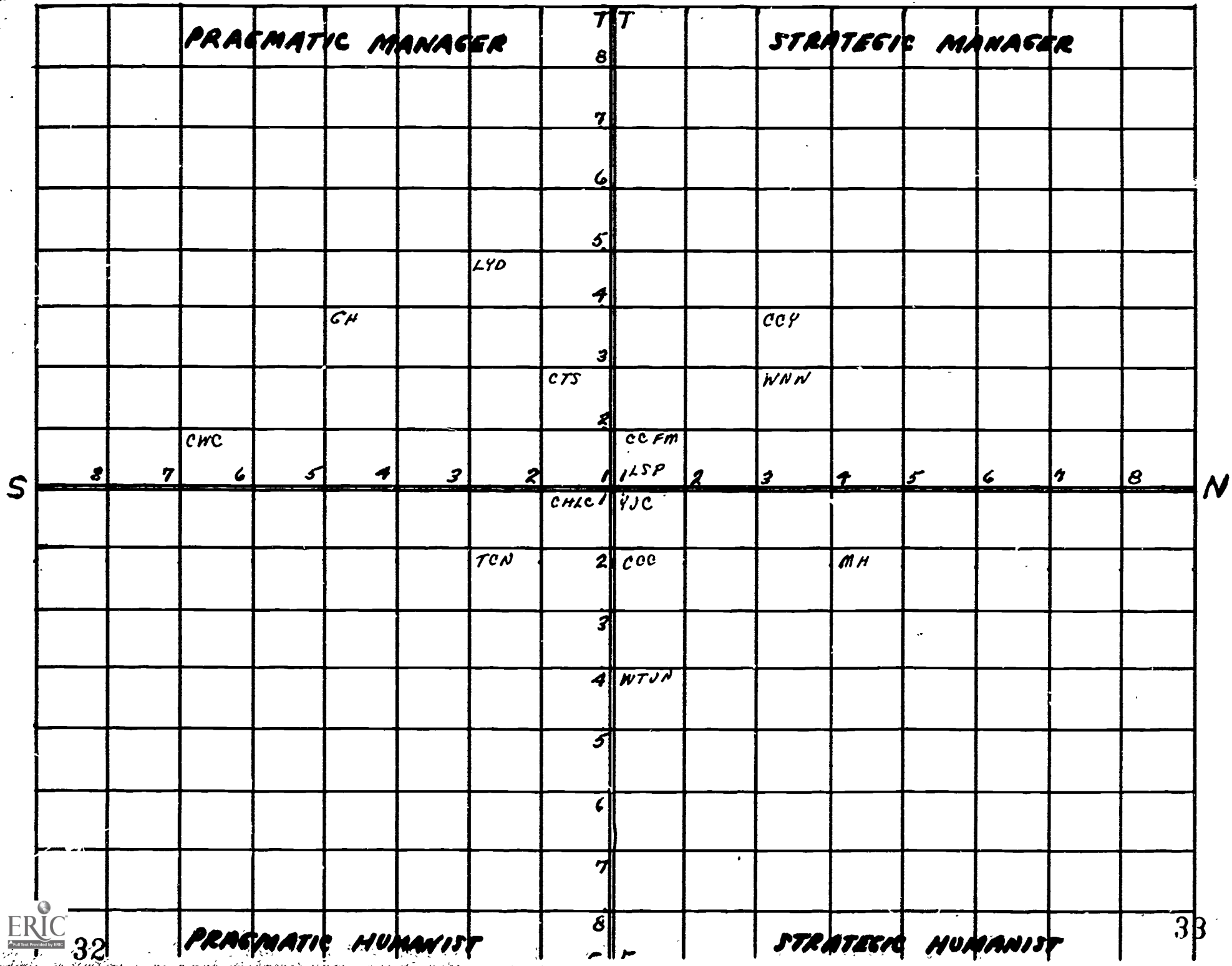


FIGURE 7

LEARNING PREFERENCES, E-VTO, 1987

STUDENTS	CE	RC	AC	AE	R	L	I	E	I	S	N	T	F	P	J
A	10	10	19	15	26	8	6	5	2	1	7	4	3	2	5
B	14	14	13	19	10	7	23	3	4	6	2	7	0	0	5
C	9	11	21	15				7	0	0	8	0	7	4	3
D	17	12	11	23	9	8	23	1	6	6	2	0	7	2	5
E	12	9	21	1?	20	15	5	3	4	6	2	4	1	2	5
F	14	12	18	21	10	8	22	4	3	6	2	6	1	0	1
G	13	9	14	19				1	6	3	5	1	6	2	6
H	21	11	19	18				6	1	5	4	3	4	2	4
I	16	11	9	20	25	9	6	7	0	6	2	6	0	5	3
J	9	16	20	16	17	20	3	3	4	7	1	5	2	0	6
K	14	13	22	11	16	6	18	1	6	2	6	1	5	7	0
L	15	13	14	20	12	14	14	2	3	6	2	2	4	2	5
M	17	7	17	21	9	17	14	4	3	8	0	4	3	1	5
N	17	19	13	7	4	11	25	6	1	8	0	2	4	1	6
O	20	12	12	17	14	14	12	2	5	5	3	2	5	0	7
P	9	12	20	13	18	7	15	6	1	0	8	4	3	5	2
Q	16	11	16	20	8	10	21	3	4	7	1	3	3	5	3
R	12	10	18	20	17	10	13	3	4	4	3	3	2	3	4
S	14	16	15	21				5	1	5	3	4	2	0	6
T	2	8	18	21	7	6	27	6	1	5	4	5	2	0	7
U	17	14	12	21	13	11	16	3	4	8	0	1	6	2	5
V	10	8	18	21	13	11	16	2	5	5	3	5	2	6	1
W	16	13	17	14	2	13	25	4	2	2	3	1	2	0	6
X	17	7	18	22	14	15	11	4	3	5	2	6	1	3	4
HIGH	20	17	22	23											
LOW	9	7	9	7											
MEAN	14.7	11.6	16.5	18.0											

FIGURE 8

TIME ON TASK, EYT, 1987

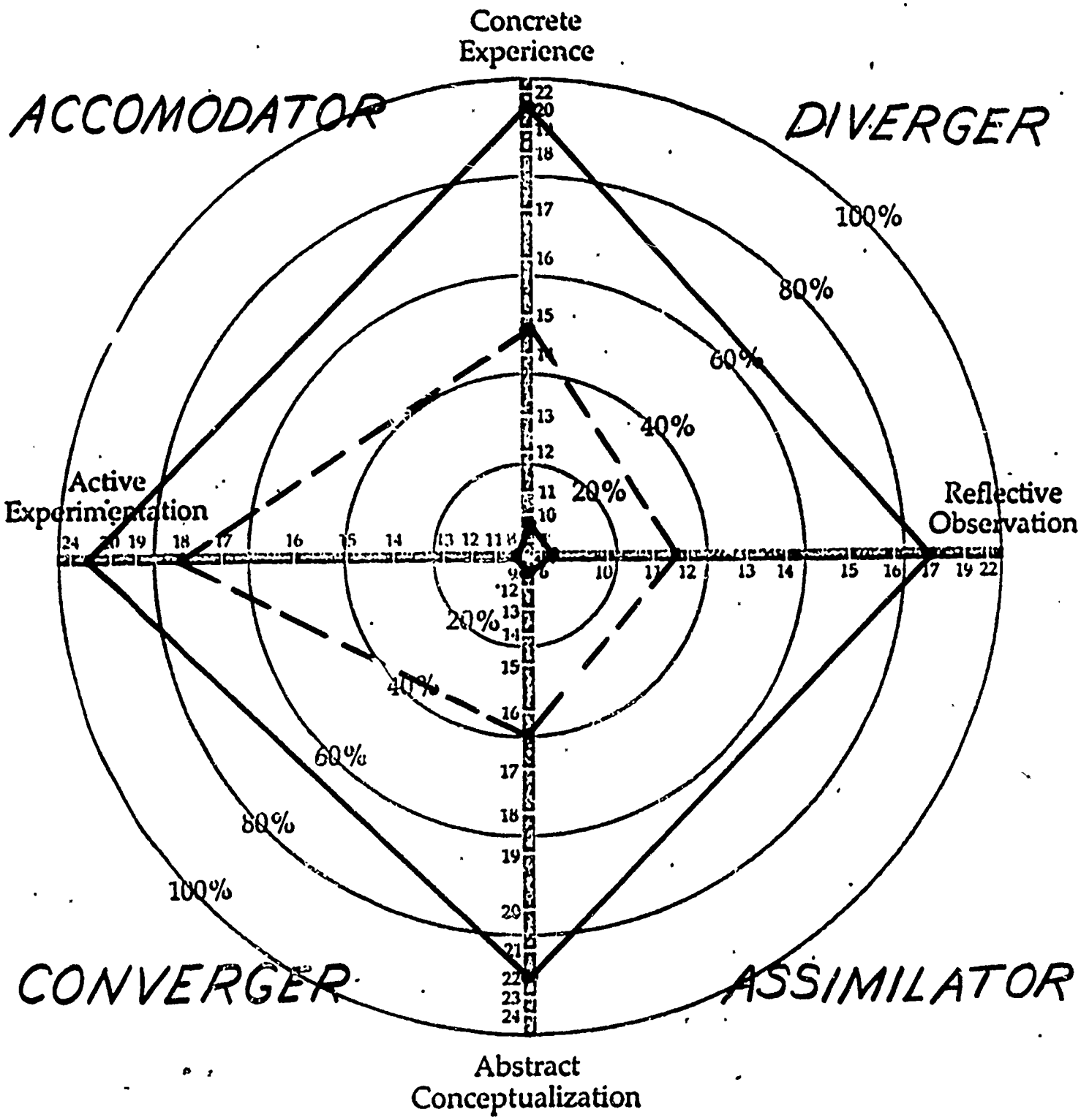
STUDENTS

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	RANGE	M
1. Hours spent reviewing the Overview, Study Guide, Synthesis Paper.	14	6		2	10	2	3		12	3		8	6	6	10	3		8		3	2	9	4			
2. Hours spent in developing the learning contract.	15	20		8	20	14	18		15	4		15	10	10	12	15		9		11	3	16	8			
3. Hours spent completing 1st required unit.	12	16		12	20	14	10		17	4		13	16	8	11	15		8		9	2	11	8			
4. Hours spent completing 2nd required unit.	15	18		10	15	10	10		10	4		12	16	8	11	14		8		15	2	14	10			
5. Hours spent completing 3rd required unit.	10	15		10	1*	16	8.5		12	4		8	12	10	10	13		8		12	2	12	15			
6. Hours spent completing 1st elective unit.	12	14		*	10		5		10	4		8	12	6	10	13		10		12	2	12				
7. Hours spent completing 2nd elective unit.	5	6		4	3	8	3.5		8	10		5	4	3	4	3		10		11	1	4	12			
8. Hours spent analyzing 3 required and 2 elective units.	45	48		40	10	19	8		63	30		16	17	50	38	42		40		30	10	26	28			
9. Hours spent analyzing summer institute.	15	9		20	41	4	15		11	10		10	6	14	8	7		15		9	7	15	8			
10. Hours spend writing synthesis paper.	15	35		10	25	15	17		18	4		21	12	7	15	25				29	4	20	12			
Total	159	189		116	155	102	98		176	77		116	111	122	129	150		114		141	35	139	105			

* CREDIT FOR PRIOR EXPERIENCE

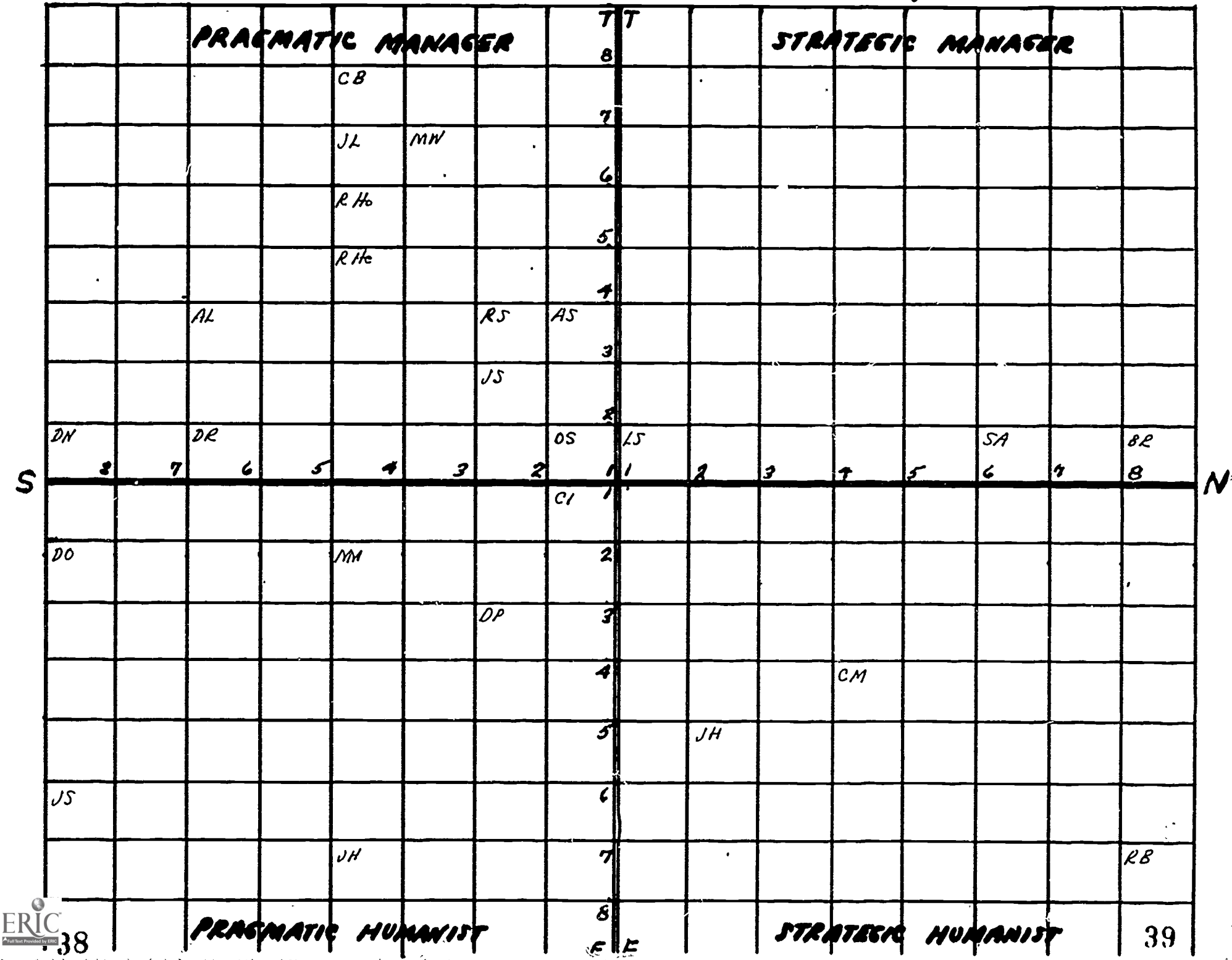
LEARNING STYLE PROFILE

Norms for the Learning Style Inventory



E-VTO, 1987

MYERS BRIGGS PLANNING STYLES, E-VTO, 1987



CHANGE IN MYERS BRIGGS, 1986 TO 1987