

A C K N O W L E D G M E N T S

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H. J. S.

THE UNIVERSITY OF MINNESOTA

GRADUATE SCHOOL

Report
of
Committee on Thesis

The undersigned, acting as a Committee of the Graduate School, have read the accompanying thesis submitted by Homer John Smith for the degree of Master of Arts.

They approve it as a thesis meeting the requirements of the Graduate School of the University of Minnesota, and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Arts.

L. H. Koos
Chairman

M. E. Huggerty

Donald G. Paterson

Date June 3rd, 1922

316015

THE UNIVERSITY OF MINNESOTA
GRADUATE SCHOOL

Report
of
Committee on Examination

This is to certify that we the
undersigned, as a committee of the Graduate
School, have given Homer John Smith
final oral examination for the degree of

Master of Arts.

We recommend that the degree of

Master of Arts

be conferred upon the candidate.

L. P. Ross
Chairman

M. J. Van Wagenen

M. E. Haggerty

Donald G. Paterson

N. S. Miller

Date _____

INDUSTRIAL AND VOCATIONAL TEACHER-TRAINING:
A STUDY OF STANDARDS OF TEACHING FITNESS AND THEIR
RECOGNITION IN PRESENT TWO-YEAR AND FOUR-YEAR CURRICULA

A T H E S I S

SUBMITTED TO THE GRADUATE FACULTY
OF THE
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BY
HOMER J. SMITH
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
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MASTER OF ARTS

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T A B L E O F C O N T E N T S

THE PROBLEM

CHAPTER ONE - The determination of Characteristics for Use in
Judging Teaching Fitness

<u>Sections</u>		<u>Pages</u>
1.	A Measuring Instrument Needed	2
2.	What 23 Rating Scales Include	3
3.	Additional Requisites Mentioned in Special Literature	9
4.	Definitions for the Purposes of This Work	17
5.	Summary of Chapter One	20

CHAPTER TWO - The Consensus of Expert Opinion as to the
Requisites for Teaching Success in Each of
Four Types of Industrial and Vocational
Classes

1.	The Questionnaire	23
2.	The Replies Used	25
3.	Unused Data and Supplemental Notes	26
4.	Method of Handling Data	29
5.	The Combined Judgments of 293 Individuals	36
6.	Differing Opinions of Four Groups of Persons Cooperating in the Study	42
7.	Summary of Chapter Two	47

CHAPTER THREE - Present Two-Year and Four-Year Curricula
 for Industrial Teacher Training, Viewed
 In the Light of Derived Standards of
 Fitness

1.	The Types of Curricula Examined	49
2.	Percentage Classification of Courses in 25 Two-Year and 25 Four-Year Curricula ..	54
3.	Evaluation	58
4.	Summary of Chapter Three	66
	SUMMARY AND CONCLUSIONS	69
	APPENDIX	75
	TABLE A (Series) Individual Placement of Requisites by 293 Individuals (Shown for Four Types of Teachers and for Four Groups of Those Cooperating)	76
	TABLE B (Series) The Foregoing Placements Compared, (Fractions and Per Cents)	88
	TABLE C (Series) The Foregoing Expressed in P. E. Numbers	102
	TABLE D (Series) - Rank Orders and Distances from an Arbitrary Zero or Point of Least Importance	108
	BIBLIOGRAPHY	110

Special Lists - References on Teachers' Rating
 Scales - References on Industrial and
 Vocational Teacher-Training, and
 Catalogue References for the Two-Year
 and Four-Year Curricula Examined

INDEX TO TABLES AND FIGURES

Table One -	Frequency of Mention of Characteristics in Teacher-Rating Scales	7
Table Two -	Unused Data, Replies Incorrectly Made But Modifying Conclusions	26
Table Three -	The Comparative Importance of Requisites for Manual Arts Teaching as Expressed by 54 Heads of Industrial and Vocational Teacher-Training Departments and Institutions. Individual Placement as Charted for Tabulation..	30
Table Four -	The Foregoing 54 Rankings Compared. Resultant Fractions	32
Table Five -	Fractional Comparisons (Table 4) Changed to Per Cents	32
Table Six -	Per Cents (Table 5) Changed to P. E. Values or Distances	33
Table Seven -	P. E. Values Used to Determine Relative Importance of Characteristics - Method Employed	34
Table Eight -	P. E. Values - Manual Arts Teacher	36
Table Nine -	P. E. Values - General Industrial Teacher.	37
Table Ten -	P. E. Values - Vocational Shop Teacher ...	37
Figure I -	Types of Teachers, Graphic Comparison - Four Rankings (Characteristics Assumed to be Equidistant, Rank Order Compared)	39
Figure II -	The Characteristics Compared	40
Table Eleven -	P. E. Values - Related Subjects Teacher ..	38
Table Twelve -	Rank Order of Characteristics	42
Table Thirteen -	The Ranking of Characteristics by Four Groups	44
Figure III -	Projection of Placements of Characteristics	46
Table Fourteen -	Percentage Distribution of Work in 25 Two-Year Curricula	55

Table Fifteen - Percentage Distribution of Work in 25 Four-Year Curricula	56
Table Sixteen - Two-Year and Four-Year Curricula Compared - Classes of Courses and the Percentage of Courses Required in Each Class	57

A P P E N D I X

Table A - Individual Placement of Characteristics by 293 Individuals	76
Table B - The Foregoing Placements Compared (Fractions and Per Cents)	88
Table C - The Foregoing Expressed in P. E. Numbers	102
Table D - Rank Orders and Distances from an Arbitrary Zero or Point of Least Importance	108

THE PROBLEM

The study here reported was made with purpose to clarify thought and to encourage more concerted action relative to the preparation of teachers of the industrial and vocational subjects of our school programs. The aims and the means are far from clearcut in these special fields. Teachers and administrators of manual subjects, as well as workers in more academic fields, discuss the work in terms not assigned exact meanings nor uniformly interpreted. There is difference of opinion among us regarding the objectives of the varying types of classwork. We are not committed to a common belief as to the requisites of teaching fitness for the varying class situations. The departments and institutions of training are found offering courses and curricula with little recognition of the fact that their output must be specially designed. The writer hoped to make possible the improvement of these conditions. He believes the facts and combined opinions here made available can serve, in some measure, to give to the special fields the trend toward definite preparation that has begun to be evident in the more academic specialities.

Chapter One reveals those characteristics and attainments thought to be necessary for success in this branch of our profession. It is an analysis of the literature dealing with the problem under consideration.

Chapter Two brings to our aid the combined judgments of 293 persons as to the relative importance of the characteristics named, the individuals consulted being those whose training and occupations constitute them a select group, prepared to judge.

Chapter Three summarizes typical curricular offerings in schools of training and affords us opportunity to compare them

in the light of our standards of fitness. These three pieces of work, by reason of their relationships, are easily unified and result in a number of definite conclusions. They open the way for standardization in so far as it may seem advisable.

C H A P T E R O N E

THE DETERMINATION OF CHARACTERISTICS

FOR USE IN

JUDGING TEACHING FITNESS

1. A MEASURING INSTRUMENT NEEDED

Judgment or measurement of anything presupposes a measuring instrument, more or less definitely conceived in its unit divisions and convenient of use. It is desired that the results of measurement be accurate and the process short. The quality or property to be judged determines in great degree the closeness with which we can evaluate it.

The ultimate basis of passing judgment on teaching fitness is, doubtless, the results of teaching, but we have yet made little progress in measurement of these results. It is unwise to delay action until the ultimate can be attained. We must arrive at tentative criteria, useful at once, in evaluation of the preparation and efforts of those in service or training.

The present study has to do with fitness for teaching in certain special fields of the school service and we are faced at the beginning with the necessity of choosing or devising an instrument of measurement. Just what natural and acquired characteristics a person should possess to be a successful teacher for the standard class and school has long been a question engaging the attention of students of education. There is an extensive literature of the subject. Much that has been written is mature opinion, the result of long and varied experience in teaching and in supervision. Some studies have been made through which there have been developed scales for the rating of teachers-in-service or for the assistance of those who must select a teacher from a group of candidates. The combined elements of the best of these printed scales would seem to be a convenient point of departure in the making of a list of qualities for use in the work upon the present problem.

2. WHAT 23 RATING SCALES INCLUDE

Examination was made of the scales presented in all of the references named below (1 to 17), and a count was made of the frequency of recurrence of the qualities and attainments included. These 23 scales are all that could be located, in form sufficiently definite to permit of classification of qualities. Writings which set forth negative qualities, that is, the causes of failure in teaching and class management, were not used, because they could not, with certainty, be translated into affirmative expressions. It was noted early in the canvass that the elements most nearly common to all scales are few in number and variously named. A characteristic given place, with five or six others, as a main head in one scale was found to be listed as a sub-head in another. The only way adequately to show what qualities are judged desirable seemed to be to chart those most often mentioned, in whatever rank of importance. (The present study was concerned only with the formulation of a list with which to work) Table One shows the frequency of mention of the characteristics most nearly common to all scales.

The combining of these various sets of desirable qualities was neither a simple nor an exact task. All scales were first examined to find, for the entire group, outstanding qualities which were common to all, even though variously expressed and variously classified as primary or secondary divisions. This preliminary canvass discovered nine main characteristics of teaching fitness or requisites for teaching success. They are (1) Adaptability and tact, (2) Executive ability and class management, (3) General scholarship, (4) Knowledge of the subject to be

taught, (5) Good Character, (6) Personality, (7) Health and appearance, (8) Methods, and (9) Professionalism. These nine were listed as the basis of a frequency table (Table One) and each scale was then given thorough examination with reference to each of the nine qualities. In this way it was determined how the twenty-three persons who have designed scales compared in their thought concerning the importance of these named attributes and attainments.

As illustrative of how a given scale was handled, we shall use the one by Boyce, presented in Number Two of the reference list which accompanies Table One, and follow it through the process of examination. We begin with I-a, General Appearance, and feel justified in crediting it to Number Seven of our listed characteristics, namely, Health and Appearance. Consideration is made in turn of each item of the scale and the numbers set opposite them cite the characteristics listed in the table which are credited with mention. In cases of clear correspondence the number is unmodified, while in cases of agreement less clear, when personal judgment was necessary, the numbers are followed by the minus sign or dash. For example, I-1, Integrity and Sincerity, corresponds closely with 5, Good Character, and bears a less close relation to 2, Executive Ability and Class Management, 6, Personality, and 9, Professionalism.

By this means we find that Boyce gives some attention to each of the nine characteristics listed, which fact is shown by the cross (x) after each in Column 2 of Table One. The totals are shown at the end of the Boyce array but the variance in importance is not transferred to Table One. In the table we simply

credit Boyce with having stressed each of the nine qualities. The 23 scales were treated in identical manner.

(From)

Efficiency Record

Boyce, in 14th Yearbook, Part Two, Page 44

I. Personal Equipment

a. General Appearance				7
b. Health				7
c. Voice			6-	
d. Intellectual Capacity		3-		
e. Adaptability and Resourcefulness	1			8-
f. Accuracy		3- 4-		
g. Industry		2-		9-
h. Enthusiasm and Optimism		2-		9-
i. Integrity and Sincerity		2-	5- 6-	9-
j. Self-Control		1-2-	6	
k. Promptness		2-	6-	9-
l. Tact		1 2-	6-	
m. Sense of Justice		2-	5- 6	

II Social and Professional Equipment

a. Academic Preparation		3 4		8-
b. Professional Preparation		2-	4-	8
c. Grasp of Subject Matter		3 4		
d. Understanding of Children		2-	6-	
e. Interest in the Life of the School			6-	9
f. Interest in the Life of the Community		1- 3-		

g.	Ability to Meet and Interest Patrons	1	3-	5	6- 7	
h.	Interest in Lives of Pupils			5-	6-	
i.	Cooperation and Loyalty	1-		5-	6-	9
j.	Professionalism and Growth		3- 4-			8- 9
k.	Daily Preparation		3- 4-			8 9-
l.	Use of English		3- 4-	6-		

III. School Management

a.	Care of Light, Heat, and Ventilation	2				9-
b.	Neatness of Room	2				8- 9-
c.	Care of Routine	2				8- 9-
d.	Discipline (Governing Skill)	1 2		6		8

IV. Technique of Teaching

a.	Definiteness and Clearness of Aim		3- 4-			8
b.	Skill in Habit Formation					8
c.	Skill in Stimulating Thought	1	3- 4-	6		8
d.	Skill in Teaching How to Study		3- 4-	6-		8
e.	Skill in Questioning					8
f.	Choice of Subject Matter		3 4			
g.	Organization of Subject Matter		3 4			8
h.	Skill and Care in Assignment		3 4			8
i.	Skill in Motivating Work	1	3- 4-	6-		8
j.	Attention to Individual Needs		3-	6-		8

V. Results

a.	Attention and Response of the Class		2- 3- 4-	6-		8
b.	Growth of Pupils in Subject Matter		3- 4-			8-

c. Moral Influence	1-	5	6																
d. General Development of Pupils	1	2-	3	4	5	6	7	8	9										
e. Stimulation of Community			3	5	6	7	9												
	11	15	21	17	8	21	5	20	13										

TABLE ONE

FREQUENCY OF MENTION OF CHARACTERISTICS
IN TEACHER-RATING SCALES

(A Reference List Accompanies the Table)

Characteristics	1	2	2a	2b	3	4	5	5a	5b	6	7	8	9	10	10a	10b	11	12	13	14a	14b	15	16	17	
1. Adaptability and Tact	x	x	x				x	x		x	x	x					x		x		x	x			
2. Executive Ability and Class Management	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3. General Scholarship	x	x		x	x	x	x		x	x		x		x	x	x	x	x	x		x	x		x	
4. Knowledge of the Subject to be Taught		x						x				x	x					x					x		
5. Good Character	x	x		x	x	x		x		x	x			x					x	x	x			x	
6. Personality	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x		x	
7. Health and Appearance	x	x		x	x		x	x	x	x	x	x		x				x	x	x	x			x	
8. Methods	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x		x	x	x	x	
9. Professionalism	x	x	x	x	x	x		x	x	x				x	x				x		x				

1, 2, 3, etc., at top of chart, refer to articles named in accompanying list.

2a - Hannibal, Missouri, and 2b, St. Louis, given in reference 2, Boyce

5a - Moses, and 5b Clapp, referred to by Coffman.

10a - Toledo, and 10b Cleveland, given in reference 10, Johnston

14a - Teacher Personality Score Card, New York, Institute for Public Service, and 14b Rugg, given in reference 14, Patterson.

These nine characteristics are found most often used in the 23 printed rating scales referred to and may be said to include nearly every element mentioned less frequently. Their average use is 19 plus out of a possible 23 times, i. e., each appeared, on the average, in 19 of the 23 scales. These nine characteristics, then, form a basic list and are to be increased in number, if necessary, by a analysis of the special literature on teaching fitness for industrial and vocational classwork.

REFERENCE LIST
of
TEACHER-RATING SCALES 1

1. Anderson, W. N. - "The Selection of Teachers" Educational Administration and Supervision, 3:83-90, February, 1917.
2. Boyce, A. C. - "Methods for Measuring Teachers' Efficiency," Fourteenth Yearbook of the National Society for the Study of Education, Part II, 1915.
3. Bradley, J. H. - "A Study of the Relative Importance of the Qualities of a Teacher and her Teaching in their Relation to General Merit." Educational Administration and Supervision, 4:358-63, Sept., 1918.
4. Clark, R. C. - "A Scale for Measuring Teachers", American School Board Journal, 62:39-40, February, 1921.
5. Coffman, L. D. - "The Rating of Teachers in Service," School Review Monographs, No. 5, pp. 13-24, 1914.
6. Cook, William A. - "Uniform Standards for Judging Teachers in South Dakota." Educational Administration and Supervision, 8:1-11, Jan., 1921.
7. Elliott, E. C. - "Provisional Plan for the Measure of Merit of Teachers. Wisconsin State Dept. of Education, 1912, Madison, Wis.

1. All articles cited were used for Table One. For a more complete list, not all usable in the present study, see Sears, J. B., "The Measurement of Teaching Efficiency," Journal of Educational Research, 4:81-94, September, 1921.

8. Foster, Frederick M. - "A Score Card for Rural Teachers" School and Society, 12: 131-132, August 21, 1920.
9. Johnston, Joseph H. "Scientific Supervision of Teaching" School and Society, 5:181-88, Feb., 17, 1917.
10. Johnston, Joseph H. - "Teacher Rating in Large Cities" School Review, 24:641-47, Nov., 1916.
11. Landsittel, F. C. - "A Score Card Method of Teacher Rating" Educational Administration and Supervision, 4:296-309, June, 1918.
12. Morton, Robert L. - "Qualities of Merit in Secondary Teachers." Educational Administration and Supervision, 5:225-38, May-June, 1919.
13. New York Rating System for Teachers Elementary School Journal 22:407-410, Feb., 1922.
14. Patterson, Herbert - How Can the Ability of Student Teachers Be Measured, Educational Administration and Supervision, 6:215-19, April, 1920.
15. Ruediger, William C. and Stroyer, G. D. - "The Quality of Merit in Teachers," Journal of Educational Psychology, 1:272-8, May, 1910.
16. Showalter, B. R. - "A Score Card for Rural Teachers" School and Society, 12:200 - Sept., 11, 1920.
17. Sprague, H. A. - "Score-Card for Rating Student-Teachers in Training and Practice." Pedagogical Seminary, 24:72-80, March, 1917.

3. ADDITIONAL REQUISITES MENTIONED

IN SPECIAL LITERATURE

Having summarized the qualities of teaching fitness most commonly employed in rating scales, we turn next to the literature of industrial and vocational education to determine whether for these special fields of work other attainments or qualities are desirable. Extracts from the writing of various specialists, as they appear in a mixed list of sources, and from the reports of special committees of national organizations in the Industrial and Vocational Education field, are here presented

as sampling the thought of administrators and others in this particular branch of the profession.

This section of the work is, doubtless, weak by reason of the absence of quantitative facts. It has been impossible, because of the great amount of the special literature, to present actual numerical and percentage frequencies of mention of either the requisites of teaching success or of the types of teaching positions. The qualitative statements seem justified by the high standing and the representativeness of the persons, committees, and sources to whom reference is made. Supplementing the footnotes supplied in connection with the extracts used, the reader is referred to the References on Industrial and Vocational Teacher-Training given in the Bibliography at the close of the paper.

Taylor,¹⁸ in setting forth the sources of supply of teachers for industrial and vocational classes, expresses himself as follows:

"For the sake of clearness, vocational teachers are divided by the committee (Special Committee of the National Society for the Promotion of Industrial Education who made a survey of the problem of training teachers in Industries) into (a) shop teachers and (b) teachers of related subjects. Three sources of supply are suggested for the former; namely: (a) the industries; (b) technical institutions; (c) normal and training schools. Each of these sources contributes desirable elements of a shop teacher's equipment, but none of them seems to be able to produce a sufficient and satisfactory supply of teachers. The industry gives the trade experience which is a fundamental prerequisite of a teacher of the trades, but this experience is not sufficient without some general education and teaching ability The

18. Taylor, Joseph S. - The Training of Vocational Teachers, p 114 of his Handbook in Vocational Education, Macmillan (1914)

conclusion is that the chief source of supply must be trades. For the supply of teachers of related subjects four sources are suggested: (a) the industry; (b) engineering schools of college grade; (c) the intermediate technical school; (d) the normal school."

Mr. K. G. Smith, writing in the Manual Training Magazine,¹⁹

aptly expresses similar judgment.

...."The raw material for the shop teacher is a skilled tradesman whose education up to the time he enters a teacher-training course, contains three elements: manual skill, technical knowledge, and trade intelligence (M.T.I.). In selecting the material for a shop teacher, we lay particular stress on the elements M. and I., that is, on the manual skill and the trade intelligence. The raw material for the teacher of related subjects is found in the teacher, the technician or the engineer, possessing in a different proportion the necessary elements M. T. and I In some cases non-vocational teachers have been found with sufficient technical knowledge to form a foundation for good related-subjects teachers. Practical experience is purposely emphasized here as a fundamental requirement for a vocational teacher The content of the training courses for industrial teachers is at the present time in a very unsettled state. However, the following facts do stand out:

"(1) A man who satisfies the prerequisites for entrance into a shop-teacher training class does not need to be taught the subject matter of his trade.

"(2) A related subjects teacher if he knows industry must be taught the related subjects as related to industry.

"(3) A related subjects teacher if he knows the related subjects must be taught industry in its relation to those subjects.

".... the first thing to be taught in any shop teachers' course is trade analysis; the determination of what is to be taught and then the proper arrangement of the material in teaching order. The second thing to be taught a shop teacher is teaching methods.

19. Smith, K. G. - The Development of Teacher-Training in Trade and Industry under the Smith-Hughes Act. Manual Training Magazine 20:193-197, February, 1919.

He knows little or nothing of lessons, of plans, of the difference between telling and showing and teaching, and all the underlying principles of the teaching process. Teaching is to him a new trade The third thing to be taught a shop instructor is instructional management, the details of handling classes, keeping records, making reports, the organization and management of industrial schools, history of industrial education and educational psychology, if you like, but not too much and of the right kind."

Dooley ²⁰, in like manner, urges the need of actual experience in the vocation in which one offers himself as prepared to instruct.

"Instructors in evening industrial classes should be practical men and women, with considerable trade experience; considerable shop practice should be used in applying the principles underlying the trade."

Perhaps, the best expression so far made of the difficulties faced by the mechanic who transfers his interest to the field of teaching is that by Ericson ²¹, extracts from which are here given for their worth in bringing before us a clear picture of industrial school service.

"What does a shop man who knows his trade thoroughly, and who is a first-class mechanic and a good man, need in addition to the knowledge of his craft in order to be a success in the school-room? After some further analysis of this question it would seem to be a fair statement to say that the success of a mechanic of this class in the teaching profession is almost wholly dependent upon his ability and willingness to make a number of changes in his mental attitude, and to readjust himself to the many conditions that must of necessity be new and radically different from those under which he has been working, perhaps for a large number of years The shop man is thoroughly accustomed to having his efficiency measured by the amount of the finished product he turns out. The efficiency

20. Dooley, William H., pp 109-110. Principles and Methods of Industrial Education. Houghton, Mifflin Company (1919).

21. Ericson, E. E. - The Readjustment of the Tradesman to the Business of Teaching. Man. Tr. Mag. 22:345-9, May, 1921.

The efficiency of an instructor in the school shop is not measured primarily by the weekly output of finished goods by his class....when a man works at the trade, he is held responsible for his own work only, both as to quantity and quality. When he becomes a shop teacher he must take upon himself the responsibility of the work of every student under his care He must understand that he has the last word in the matter of methods and procedure in the shop Boys expect to be disciplined. They will soon lose their respect for the teacher who has not firmness enough in his character to keep order in his shop There is a broad, general responsibility with reference to the welfare of the students of the entire school that all instructors must partake of."

The work of the various types of special teachers is set forth by Mr. Lewis Carris ²², agent in the service of the Federal Board for Vocational Education.

"For teachers of shop subjects in general industrial schools and in part-time schools when the shop work is of a general or elementary character, there are schools which give, to a considerable degree, the training required in shop subjects ... Certain schools for the preparation of manual arts teachers also give, to a large measure, the shop training required

"The related subjects teachers in the all-day, part-time, or evening classes give that part of the trade and industrial education which is an inherent part of the vocation taught. The subject matter is, however, of such a nature that it may be taught in the ordinary classroom or science laboratory - such as the drafting which goes with the trade, the mathematics which the master of a trade should know, the science which can be taught to the prospective trade worker. For this type of teacher a higher degree of scholastic preparation can be required"

Mr. Charles R. Allen,²³ author of two recent books of great merit in the field of vocational education (The Instructor,

22. Carris, Lewis H. - The Training of Vocational Teachers for Trades and Industries. pp 18-26 Proceedings of the National Society for Vocational Education. No. 26.

23. Allen, Charles R. - Evening Trade Teacher Training Courses, pp 62-64. Proceedings of the National Society for Vocational Education. (1919)

the Man, and the Job, and The Foreman and His Job) has expressed briefly and clearly the qualities of the trade instructor in a paper before the National Society for Vocational Education.

"The trade instructor requires two assets. First, a thorough command of the trade that he is to teach. Second, a command of the operations, methods, and processes of the teaching trade as they apply to his trade."

In manner very similar, we have from Mr. H. B. Smith ²⁴ a statement of the work of the teacher of related subjects.

"A highly skilled mechanic has acquired not only skill in the manipulation of machines and hand tools, but also a certain fund of information known as trade knowledge and technical knowledge much of which is absolutely necessary to the carrying on of his trade and part of which is only indirectly related or related in such a way as to make it possible for him to advance to a position of more importance. This fund of information which deals usually with drawing, mathematics, mechanics or science but which is not necessary for the acquiring of skill in manipulation, is called related subject matter

"In order to teach the related subject matter an instructor must have a sufficient acquaintance with actual trade conditions and trade work so as to understand fully how the related subject matter is used by the mechanic. He must have a thorough knowledge of the related subject matter itself, must understand the principles of teaching and must know something of the history and much of the principles of industrial education."

For more detailed and clearly outlined presentations of the special types of teachers and of work under consideration in this study attention is called to a monograph on Teacher Training ²⁵, issued by the Wisconsin State Board of Vocational

24. Smith, H. B. - Training Related Subjects Teachers. pp 65-67. Proceedings of National Society for Vocational Education (1919)

25. Teacher Training, Courses of Study, Monograph No. 5. State Board of Vocational Education, Madison, Wisconsin.

Education, and to a part of the Bureau of Education bulletin, entitled Vocational Secondary Education ²⁶ which is, in fact, the report of the Committee on Vocational Education of the National Education Association. A bulletin of the Federal Board ²⁷ suggests qualifications for classified positions as follows. These are extensive treatments and parallel closely the references quoted.

Unit Trade School

p55 General Qualifications of Shop Teachers

pp57-8 The Related Subjects Teacher

The General Industrial School

pp85-86 Qualifications of Teachers

Part-Time Schools or Classes

Trade Extension Type

p76 Qualifications of Teachers

Trade Preparatory Type

p82 Qualifications of Teachers

General Continuation Type

pp88-9 Qualifications of Teachers

Evening Industrial Schools or Classes

pp101-104 Qualifications of Teachers

Transcript is made in closing this series of a part of the report of a committee of the National Society for Vocational

26. Vocational Secondary Education, The Qualifications of Instructors. pp 83-85. Bu. of Ed. Bul. No. 21, 1918.

27. Fed. Bd. for Voc. Ed. Bul. 17, Trade and Industrial Education Series No. 1, October, 1918. Govt. Print. Office, Washington - Organization and Administration.

Education ²⁸ which deals specifically with teaching requisites.

"1. The qualifications of industrial school teachers must be determined by the special needs of the industrial school.

"2. The kinds of qualifications required are industrial, educational, personal, and teaching qualifications.

"3. Two classes of teachers are recognized in this report: (1) vocational teachers who are of two kinds: trade and technical; and (2) non-vocational teachers.

"4. Trade teachers should be masters of every department of their trade, and versed in its technical knowledge; graduates of at least the elementary school or its equivalent; possessed of good health, habits, and personality and the ability to deal with people as well as with boys or girls.....

"5. Technical teachers must have sufficient trade experience to enable them to make practical application of their instruction. They should have technical training in their special subjects equal to that represented by graduation from a secondary technical school. Their teaching and personal qualifications should be the same as those required of trade teachers."

These extracts being typical of the printed expression on the subject in question by specialists and committees of national organizations, one is led to conclude that the nine characteristics arrived at in the preceding section (Adaptability and tact, Executive ability and class management, General scholarship, Knowledge of the subject to be taught, Good character, Personality, Health and appearance, Methods, and Professionalism) are desirable but not quite sufficient for teachers of industrial and vocational classes. A tenth must be added which for

28. The Selection and Training of Teachers for State-Aided Industrial Schools. p. 15-Proc. National Society for Vocational Education. (1914) Bul. Vol. 19.

convenience we shall term Industrial Experience or Contact.

Search of the special literature has also brought out that there are recognized four large divisions of the industrial-vocational branch of the teaching profession. We find frequent reference to manual training work, general industrial training, vocational shopwork, and the teaching of the related subjects. Other terms appear and there are mentioned various sub-divisions specialities, but these four may be said to cover the full range of the special service.

The ten characteristics of fitness and the four teacher types will next be defined and an attempt will be made to determine which of the characteristics should be thought of as having greatest importance in the preparation of men for each of the four types of teaching.

4. DEFINITIONS FOR THE PURPOSES OF THIS WORK

The Types of Teachers

The following definitions were framed by the writer to be included in a questionnaire blank used for securing expert opinion of teaching fitness. It was desired to have the ten selected characteristics given rank order of importance for each of the four types of teachers, and it seemed necessary that all persons cooperating should have conceptions of the work of these teachers as nearly identical as possible. The type names, although clearly suggestive to those acquainted with the literature of industrial and vocational education, did present the possibility of varied interpretation. The definitions were made a part of the questionnaire blank.

A Manual Arts Teacher - one who teaches woodwork, metal work, drawing, etc., in an elementary or a high school, for general educational purposes (not for vocational training).

A General Industrial Teacher - one who teaches the elements of materials and processes in several lines (woodwork, sheet-metal, electricity, etc.) in small schools, the course being a composite one and presented by one person.

A Vocational Shop Teacher - one who teaches a trade or vocation in a junior or a senior high school, a vocational school, a part-time class, or an evening school, the aim being preparation for a life work.

A Related Subjects Teacher - one who teaches mathematics, science, drawing, safety, etc., as related strictly to vocations, incidentally or in scheduled class periods.

The Characteristics

The following ten definitions are likewise the work of the writer. Personal judgment was supplemented, in their making, by details offered in connection with some of the rating scales previously mentioned. These did not form a part of the questionnaire blank, but may well have been included. If confusion as to meaning of them existed in the minds of the persons cooperating, it was brought to my attention in but two instances. Two persons interpreted Professionalism to be an undesirable quality and expressed surprise to find it listed with nine other essential qualities of fitness.

Adaptability and Tact - the ability to adjust oneself to unusual class conditions and to the varying situations which face one in his professional and social contacts.

Executive Ability and Class Management - the quality of leadership and of persistent constructive effort as they may effect the conduct of students in the schoolroom, the supply and disposition of equipment and materials, and the physical condition of a given department.

General Scholarship - the grasp of information and values in a wide range of subjects, coupled with accuracy of oral or written expression.

Knowledge of the Subject to be Taught - the ready command of subject matter within a field, far in excess of what is expected to be acquired by the average student of the group. (For the teaching of shop processes this is assumed to be the possession of skill in handling tools, machines, and materials as they are handled in actual practice.)

Good Character - the condition of being above suspicion of immorality, vice, depravity, bitterness, etc., and of possessing such qualities as honesty, kindness, and fidelity.

Personality - the possession of the good traits that give one individuality in the minds of those who know him - mental and physical poise, earnestness, and the active and energetic support of what is seen to be for social betterment.

Health and Appearance - personal attractiveness as dependent upon a healthful, vigorous appearance and the absence of distracting conditions of body or dress.

Industrial Experience or Contact - the earning of one's livelihood for at least three years by some industrial work or the gaining of information about certain industrial experiences without actually participating in them for pay.

Methods - Knowledge of how to adapt one's means of presentation, drill, and testing to the abilities and needs of the groups concerned; skill in motivation and the certainty of gaining proper student activity.

Professionalism - the desire for growth in knowledge of the subject and in teaching power; a general attitude of helpful cooperation with all who endeavor to promote educational accomplishment.

5. SUMMARY OF CHAPTER ONE

1. The following ten characteristics are found to be sufficient in number and proper in kind for the designing of the questionnaire blank discussed in Chapter Two. They have been defined in the preceding section.

Adaptability and Tact

Executive Ability and Class Management

General Scholarship

Knowledge of the Subject to be Taught

Good Character

Personality

Health and Appearance

Methods

Professionalism, and

Industrial Experience or Contact

2. The following four kinds of teachers are most frequently mentioned in our literature and may be said to represent the chief classes of the industrial-vocational teaching service. (Quantitative data were not shown to support this statement but the replies to questionnaires in which they were defined entirely supported the qualitative judgment.)

Manual Arts Teacher

General Industrial Teacher

Vocational Shop Teacher

Related Subjects Teacher

CHAPTER TWO

The Consensus of Expert Opinion as to the
Requisites for Teaching Success in Each of
Four Types of Industrial and Vocational
Classes

1. THE QUESTIONNAIRE

Chapter One located ten qualities or attainments which seem uniformly to affect judgment when the fitness of a person for teaching any industrial or vocational subject is being considered. These ten were worked into a questionnaire blank so that a combined ranking might be secured and the relative importance of the qualities be known. Alphabetical arrangement was given to the ten characteristics in making up the check-sheet, except that those of very like kind were brought together for greater ease in ranking. Reference to the questionnaire blank, following this page, will show that the characteristics were placed in exactly the same order four separate times on the same blank. Above each list is the type name of a teacher with definite duties, and the persons cooperating were requested to think of the ten characteristics with special reference to each of the four kinds of classroom service. It was assumed that the varying aims of the school subjects necessitate varying preparations for teaching these subjects. The characteristics being common, it was reasonable to expect them to be unequally stressed for the four teacher types. (This expectation is borne out, as later pages will reveal.)

For each of the four teacher-types the person addressed was requested to consider the ten characteristics and to rank them in importance from 1 to 10 (1 to indicate greatest importance). Questionnaires were addressed (1) to all State and Federal Supervisors of Trade and Industrial Education, (2) to the Supervisors of Industrial and Vocational Education in the public schools of cities 50,000 and more in population, and (3) to the Heads of Industrial and Vocational Teacher-Training Departments

TO ASCERTAIN EXPERT OPINION ON TEACHING FITNESS FOR
INDUSTRIAL AND VOCATIONAL SCHOOL CLASSWORK

Definitions, for the purpose of this study

- A MANUAL ARTS TEACHER - one who teaches woodwork, metal-work, drawing, etc., in an elementary or high school for general educational purposes (not for vocational training).
- A GENERAL INDUSTRIAL TEACHER - one who teaches the elements of materials and processes in several lines (woodwork, sheet-metal, electricity, etc.) in small schools, the course being a composite one and presented by one person.
- A VOCATIONAL SHOP TEACHER - one who teaches a trade or vocation in junior or senior high school, vocational school, part-time class, or evening school, the aim being preparation for a life work.
- A RELATED SUBJECTS TEACHER - one who teaches mathematics, science, drawing, safety, etc., as related strictly to vocations, either incidentally or in scheduled class periods.

The ten qualities named below are found to be most frequently mentioned in the literature of the subject. Please rank them from 1 to 10 in the order of importance (1 to indicate greatest importance), for each of the four types of teachers.

Manual Arts Teacher	General Industrial Teacher	Vocational Shop Teacher	Related Subjects Teacher
---Adaptability and Tact	---Adaptability and Tact	---Adaptability and Tact	---Adaptability and Tact
---Executive Ability and Class Management	---Executive Ability and Class Management	---Executive Ability and Class Management	---Executive Ability and Class Management
---General Scholarship	---General Scholarship	---General Scholarship	---General Scholarship
---Knowledge of the Subject Taught	---Knowledge of the Subject Taught	---Knowledge of the Subject Taught	---Knowledge of the Subject Taught
---Good Character	---Good Character	---Good Character	---Good Character
---Personality	---Personality	---Personality	---Personality
---Health and Appearance	---Health and Appearance	---Health and Appearance	---Health and Appearance
---Industrial Experience or Contact	---Industrial Experience or Contact	---Industrial Experience or Contact	---Industrial Experience or Contact
---Methods	---Methods	---Methods	---Methods
---Professionalism	---Professionalism	---Professionalism	---Professionalism

NAME _____

POSITION _____

CITY _____ STATE _____

and Institutions. It is a matter of regret that lists of such officers are not available in more complete and convenient form. Many offices rather than officers were addressed, many communications were returned upopened, and the percentage of returns was thus affected in some measure. Despite these last-named considerations there is reason for satisfaction with the interest manifested in the study. The percentage of returns is not low; the total number is sufficiently large to give fairly reliable results.

2. THE REPLIES USED

Thirty-three (33) usable replies were received from State and Federal supervisors, this number being about 60 per cent of the possible number of replies. All of the persons addressed were not reached.

Seventy-five (75) usable replies came from city supervisors in towns of 50,000 and more population. This number is slightly in excess of one-half the number of such cities. The return is, however, to be considered as being about 70 per cent because some cities employ no such special officer and the office rather than the incumbent was addressed in a majority of these cases.

Fifty-four (54) usable replies were mailed by heads of teacher-training departments and institutions, which number is a return of about 75 per cent of those sent out.

In addition to these replies, specifically requested, 131 others were received through the interest of those to whose attention the work was called. Some administrators requested additional questionnaire blanks and had them filled out by teachers in their employ. In three or four cases teachers-in-

training were asked to fill blanks as a class exercise. This interest was gratifying, indeed, and the data so received were of much importance as they afforded a random sampling of opinion from within the ranks of another group closely concerned. After tabulation had been completed approximately 100 replies were received.

In all, then, 293 individual replies were used, which number is much in excess of the number of people first addressed. Insofar as a true percentage of returns may be calculated under such circumstances, it seems justifiable to set the number at 75 per cent returned and usable. The data seem in amount and source to be sufficient and worthy.

3. UNUSED DATA AND SUPPLEMENTAL NOTES

Nineteen of the persons cooperating in the study did not properly interpret the method of ranking or felt that it was impossible to assign unequal values to all characteristics named. Although these replies were not used, they are here shown for their value in influence upon the conclusions drawn later.

TABLE TWO

UNUSED DATA, REPLIES INCORRECTLY MADE
BUT MODIFYING CONCLUSIONS

MANUAL TRAINING TEACHER

Nineteen Cases, Left to Right

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
*a	1-	8-	4-	4-	2-10-	9-	4-	1-	6-10-	3-	1-	2-	2-	3-	5-	1-	1-		
*b	2-	5-	5-	2-	3-10-	9-	1-	1-	2-	8-	6-	1-	2-	2-	2-	4-	2-	1-	
c	2-	5-	1-	3-	5-	8-	6-	7-	4-	4-	9-	2-	3-	6-	3-	2-	8-	5-	5-
d	1-	7-	1-	1-	1-10-	9-	8-	1-	5-	8-	5-	2-	1-	2-	1-	2-	1-	1-	
e	1-	5-	6-	5-	8-10-	10-	6-	1-	1-10-	1-	1-	1-	1-	1-	1-	1-	1-	1-	
f	1-	6-	3-	4-	8-10-	8-	3-	1-	1-	9-	1-	1-	4-	2-	3-	1-	2-	1-	
g	2-	5-	7-	6-	8-10-	8-	9-	1-	1-	6-	1-	1-	5-	2-	3-	1-	3-	1-	
h	2-	5-	8-	1-	7-	7-	8-	5-	6-	3-	7-	8-	4-	3-	3-	3-	3-	5-	1-

MANUAL TRAINING TEACHER (continued)

i	1- 8- 2- 1- 4- 9- 6- 2- 1- 7- 9- 7- 4- 7- 3- 2- 2- 4- 1
j	2-10- 2- 2- 6-10- 5-10- 5- 8- 9- 4- 5- 8- 3- 4- 1-10- 5

GENERAL INDUSTRIAL TEACHER

a	1- 8- 4- 4- 3-10- 9- 4- 1- 6-10- 3- 1- 2- 2- 3- 2- 1- 1
b	2- 9- 6- 3- 5-10- 9- 1- 1- 2- 9- 7- 4- 2- 2- 2- 1- 2- 1
c	2- 5- 2- 3- 6- 8- 6- 7- 7- 1- 8- 2- 2- 5- 3- 2- 4- 5- 5
d	1- 8- 1- 1- 1-10- 9- 8- 1- 5- 9- 5- 3- 1- 2- 1- 1- 1- 1
e	1- 5- 8- 5- 8-10-10- 6- 2- 1-10- 1- 1- 1- 1- 1- 2- 1- 1
f	1- 8- 7- 4- 8-10- 8- 3- 3- 1- 8- 1- 1- 6- 2- 3- 1- 2- 1
g	2- 8- 9- 6- 8-10- 8- 9- 2- 1- 7- 1- 1- 4- 2- 3- 1- 3- 1
h	2- 8- 2- 2- 2- 7- 8- 2- 5- 3- 6-10- 5- 3- 3- 3- 1- 5- 1
i	1-10- 5- 2- 4- 9- 6- 5- 1- 7- 9- 8- 4- 7- 3- 2- 2- 4- 1
j	2- 5- 3- 2- 7-10- 5-10- 6- 8- 8- 4- 6- 8- 3- 4- 1-10- 5

VOCATIONAL SHOP TEACHER

a	1- 7- 4- 4- 3-10- 9- 4- 1- 6- 9- 3- 4- 2- 2- 3- 1- 1- 1
b	2-10- 6- 2- 5-10- 9- 1- 1- 3- 8- 6- 4- 2- 2- 3- 2- 2- 1
c	2- 5- 2- 3- 6- 8- 6-10-10- 5- 5- 2- 5- 6- 3- 4- 2- 8- 5
d	1- 9- 1- 1- 1-10- 9- 7- 1- 4-10- 5- 1- 1- 2- 1- 1- 1- 1
e	1- 5- 7- 5- 8-10-10- 6- 2- 1-10- 1- 2- 1- 1- 1- 2- 1- 1
f	1- 5- 8- 4- 8-10- 8- 3- 3- 1- 9- 1- 9- 4- 2- 3- 1- 2- 1
g	2- 5- 9- 6- 8-10- 8- 8- 2- 1- 7- 1- 8- 3- 2- 3- 4- 3- 1
h	2-10- 2- 2- 2- 7- 9- 2- 1- 2-10- 4- 2- 1- 2- 1- 1- 1- 1
i	1- 8- 5- 2- 4- 9- 6- 5- 1- 7- 8- 7- 3- 5- 3- 2- 2- 2- 1
j	2- 1- 3- 2- 7-10- 5- 9-10- 8- 5- 8- 9- 7- 3- 4- 1-10- 5

RELATED SUBJECTS TEACHER

a	1-10- 4- 4- 2-10- 9- 5- 1- 5- 9- 4- 2- 2- 2- 3- 3- 1- 1
b	2- 7- 5- 2- 3-10- 9- 3- 1- 3- 9- 3- 2- 2- 2- 3- 1- 2- 1
c	2- 8- 2- 2- 6- 8- 9- 6- 5- 6- 8- 2- 1- 3- 3- 1- 1- 5- 5
d	1- 8- 1- 1- 1-10- 9- 1- 1- 4- 9- 5- 3- 1- 2- 1- 2- 1- 1
e	1- 5- 6- 5- 8-10-10- 7- 2- 1-10- 1- 2- 1- 1- 1- 2- 1- 1
f	1- 7- 7- 4- 8-10- 8- 4- 3- 1- 9- 1- 2- 6- 2- 3- 1- 2- 1
g	2- 7- 8- 6- 8-10- 8- 8- 2- 1- 6- 1- 2- 7- 2- 3- 3- 3- 1
h	2- 9- 9- 1- 5- 7- 7- 9- 2- 2- 8- 6- 6- 4- 3- 3- 8- 7- 1
i	1- 8- 4- 2- 4- 4- 8- 2- 1- 7- 9- 7- 4- 5- 3- 2- 2- 4- 1
j	2- 4- 3- 2- 7-10- 5-10- 5- 8- 9- 8- 5- 8- 3- 4- 1-10- 5

* (a) Adaptability and tact, (b) Executive ability and class management, (c) General scholarship, (d) Knowledge of the subject to be taught (e) Good character (f) Personality (g) Health and appearance (h) Industrial experience or contact (i) Methods, and (j) Professionalism.

Table should be read as follows: (Manual Training Teacher, first vertical column) one individual, instead of ranking the above characteristics from 1 to 10, gave only two separate rankings, 1 and 2. He judged the characteristics to fall within two groups as to importance. Other individuals expressed various other judgments.

A few of those replying to the questionnaire gave expression, through notes written on the blanks or by letters, to the fact that they experienced difficulty in giving the ten characteristics a definite order of importance. Three or four persons said they were unable to rank them. Extracts are here given so that the thought of this group may be recorded. "It is difficult to number these in 1-2-3 order, as most of them are essential and one or two of them seem to be a reiteration of others in the list." "I do not rank health or good character because no teacher should teach without these prerequisites." "I do not underestimate good character, but it seems to me rather out of line with other qualifications mentioned." "I feel that the ratings are really too general to be of real service. Thus, adaptability and tact are definitely related to personality; health is a prerequisite for any work, as is also good character."

Two considerations are urged in reply to these suggestions. The ten characteristics used in the questionnaire are those most frequently mentioned in the literature of the subject. Thus, their use for this study will either bind us more or less firmly to them as attributes for judgment or it will lead us to more definite thinking and to the stressing of qualities other than those listed. There may have been misunderstanding as to the results expected from combining the various judgments. It was not intended to assign any one characteristic very great importance and then to place the other nine at equally-distant points below it, to the position of no importance. The statistical method next described makes it possible to assign a given characteristic any importance that we will and to arrange the others above or below

it at unequal distances. The line of projection turns out to be a scale of points placed at unequal distances from each other. The characteristics take a definite rank order but distribute themselves scatteringly, from the point of lowest importance. The exact position of each characteristic is subsequently shown in P. E. distances and by graphs.

4. Method of Handling Data

The data were requested with purpose to obtain a composite of expert opinion as to the relative importance of the characteristics named, all being considered to contribute in some measure to the teaching fitness of one in service or enrolled in a preparatory institution. The rank order of importance of the characteristics for each of the four types of teachers named was desired. The handling of data reveals these rank orders as well as affording comparison of the judgments of typical groups of those cooperating in the study.

Individual rankings were charted as received in the manner shown by Table Three, which follows. Each lateral column represents the place (1 to 10) assigned by an individual to each of the ten characteristics here named:- Adaptability and Tact, Executive Ability and Class Management, General Scholarship, Knowledge of the Subject to be Taught, Good Character, Personality, Health and Appearance, Industrial Experience or Contact, Methods, Professionalism. The table gives this detail as supplied by 54 Heads of Industrial and Vocational Teacher-Training Departments or Institutions.

TABLE THREE

The Comparative Importance of Requisites for Manual Arts Teaching as Expressed by 54 Heads of Industrial and Vocational Teacher-Training Departments and Institutions

Individual Placement as Charted For Tabulation

Adaptability and Tact	Executive Ability and Class Management	General Scholarship	Knowledge of the Subject to be Taught	Good Character	Personality	Health and Appearance	Industrial Experience or Contact	Methods	Professionalism
6	4	7	1	3	5	2	9	8	10
2	1	7	3	4	5	6	8	9	10
3	4	9	1	10	2	7	5	6	8
6	3	7	4	1	2	9	10	5	8
5	4	6	1	7	10	8	2	3	9
2	3	8	4	7	1	5	9	6	10
9	2	6	1	5	3	7	8	4	10
8	7	5	4	1	2	3	10	6	9
6	5	9	1	3	4	7	10	2	8
4	2	8	1	6	3	9	7	10	5
7	5	6	4	1	2	3	8	9	10
5	2	4	3	1	8	9	6	7	10
5	3	4	2	1	7	9	8	6	10
5	4	6	3	2	1	8	7	9	10
5	1	4	7	3	2	6	10	9	8
5	3	4	1	6	7	9	2	8	10
1	6	9	2	5	7	8	3	4	10
3	8	7	4	1	5	6	2	9	10
4	1	3	2	6	5	10	9	8	7
5	3	1	2	7	8	9	6	4	10
5	3	4	1	8	7	9	6	2	10
4	2	5	1	6	7	8	3	9	10
6	8	5	1	2	3	4	9	7	10
5	6	4	2	7	1	3	8	9	10
8	7	3	2	1	9	10	4	5	6
3	4	10	1	8	7	6	2	5	9
5	3	6	4	1	2	8	10	7	9
7	5	3	1	4	8	9	6	2	10
6	4	8	1	7	2	9	5	3	10
9	4	8	1	6	2	8	7	3	10
3	4	10	1	8	7	6	2	5	9
2	4	6	1	3	7	8	9	5	10

4	1	6	5	2	7	3	8	9	10
2	3	4	1	5	6	7	10	8	9
7	2	6	1	4	8	9	5	3	10
8	6	4	3	1	2	5	7	9	10
4	5	9	3	1	2	6	8	7	10
5	3	9	2	7	4	8	10	1	6
6	3	9	1	2	5	7	10	4	8
4	7	6	3	5	8	9	1	2	10
9	8	1	3	7	5	10	2	4	6
3	6	7	4	1	2	8	9	5	10
4	1	5	2	8	3	7	9	6	10
5	7	9	6	3	1	2	4	8	10
10	7	5	3	1	8	9	4	6	2
9	3	2	1	6	8	7	5	4	10
1	4	8	5	2	9	7	6	3	10
6	4	3	2	1	8	7	9	5	10
4	2	7	3	1	5	6	10	9	8
5	4	8	3	1	2	7	6	9	10
3	6	5	1	2	4	8	9	7	10
5	6	4	3	1	9	2	10	7	8
1	4	6	3	8	2	10	5	7	9
8	7	5	3	1	6	10	9	4	2

Note: Data for the total of 293 replies, concerning each of four types of teachers, are shown in the Appendix, Table A, Pages 76-87.

The individual rankings having been thus charted, the vertical columns were compared, two and two, to find the one column in each pair that showed the preponderance of large numbers and consequent lower importances. For example, following down vertical Columns One and Two, at the left of the table, we find that Column One has the larger number in 36 of the 54 pairs. Each column was similarly checked against each of those succeeding it from left to right - 1 with 2, 3, 4, etc.; 2 with 3, 4,9, etc. The measure of predominance was recorded as a fraction, resulting in Table Four.

TABLE FOUR

The Foregoing 54 Rankings ComparedResultant Fractions

	1	2	3	4	5	6	7	8	9	10
1 >	-----	34/54	-----	46/54	32/54	29/54	-----	-----	-----	-----
2 >	-----	-----	-----	43/54	-----	-----	-----	-----	-----	-----
3 >	31/54	36/54	-----	49/54	39/54	32/54	-----	-----	-----	-----
4 >	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
5 >	-----	30/54	-----	32/54	-----	-----	-----	-----	-----	-----
6 >	-----	33/54	-----	40/54	36/54	-----	-----	-----	-----	-----
7 >	41/54	43/54	32/54	38/54	45/54	44/54	-----	28/54	34/54	-----
8 >	36/54	43/54	36/54	50/54	39/54	36/54	-----	-----	31/54	-----
9 >	34/54	37/54	31/54	51/54	34/54	31/54	-----	-----	-----	-----
10 >	50/54	49/54	46/54	52/54	50/54	49/54	45/54	40/54	48/54	-----

The table should be read as follows: "Column 1 is greater than Column 5 in 32/54 of the cases; 7 > 4 in 48/54 of the cases, etc. (The larger number occurs more often in vertical Column 1 than in vertical Column 5, etc.)

Note: Tables of identical construction for the total of 293 replies are shown in the Appendix, Pages 88 -101.

The Fractional Comparisons shown in Table Four were next translated into per cents and the per cents were tabulated in positions corresponding to common fractional equivalents.

Table Five is thus a translation of Table Four.

TABLE FIVE

Fractional Comparisons (Table 4) Changed to Per Cents

	1	2	3	4	5	6	7	8	9	10
1 >	--	63	--	85	59	54	--	--	--	--
2 >	--	--	--	80	--	--	--	--	--	--
3 >	58	67	--	91	72	59	--	--	--	--
4 >	--	--	--	--	--	--	--	--	--	--
5 >	--	56	--	59	--	--	--	--	--	--
6 >	--	61	--	74	67	--	--	--	--	--
7 >	76	80	59	89	84	82	--	52	63	--
8 >	67	80	67	93	72	67	--	--	58	--
9 >	63	69	58	95	63	58	--	--	--	--
10 >	93	91	85	96	93	91	84	74	89	--

The table should be read as follows: Column 5 > Column 3 in 56 per cent of the cases. Note: Tables of identical construction for the total of 293 replies are shown in the Appendix, Pages 88- 101.

The per cents secured were next changed to P. E. values by use of the Table of P. E. Values Corresponding to Given Per Cents of the Normal Surface of Frequency. See Van Wagenen¹ Table 28, Page 32. Results are set forth in Table Six.

TABLE SIX

Per Cents (Table 5) Changed to P. E. Values or Distances

	1	2	3	4	5	6	7	8	9	10
1 >	-	.49	-	1.53	.33	.14	--	-	-	-
2 >	-	-	-	1.24	-	-	-	-	-	-
3 >	.29	.65	-	1.98	.86	.33	-	-	-	-
4 >	-	-	-	-	-	-	-	-	-	-
5 >	-	.22	-	.33	-	-	-	-	-	-
6 >	-	.41	-	.95	.65	-	-	-	-	-
7 >	1.04	1.24	.33	1.81	1.47	1.35	-	.07	.49	-
8 >	.65	1.24	.65	2.18	.86	.65	-	-	.29	-
9 >	.49	.73	.29	2.43	.49	.29	-	-	-	-
10 >	2.18	1.98	1.53	2.59	2.18	1.98	1.47	.95	1.81	-

Table should be read as follows: The P. E. distance from Column 1 down to Column 2 is .49; from 3 down to 4 is 1.98, etc. Note: Tables of identical construction for the total of 293 replies are shown in the Appendix, Pages 102-107.

Having obtained the P. E. distances from each characteristic to each other one lower in rank, it was necessary to compute their relative distances from the position of "number ten", the highest number and, therefore, the point lowest in the scale. This was done by securing, through averaging, the true meaning of the several relationships expressed by the P. E. values. The resultant values are really distances from 10 and permitted

1. VanWagenen, Marvin J. - Historical Information and Judgment in Pupils of Elementary Schools. Teachers College, Columbia University, Contributions to Education, No. 101, Teachers College, Columbia University, New York City, 1919.

placement in rank order of importance. The calculation is shown by Table Seven which follows. The work is shown in full for the sake of clarity and to obviate the necessity for explanation as results of other data are announced.

Just here it must be explained that to place the ten given characteristics in any certain rank order does not assign zero value to the first, exceedingly high value to the last, and definite and equally spaced intermediate values to the remaining eight. The characteristic given lowest rank may be said to be of any thinkable amount of desirability and all of those following it are to be thought of as more important still - relatively more important as indicated by their distances from it.

TABLE SEVEN

P. E. VALUES USED TO DETERMINE RELATIVE IMPORTANCE
OF CHARACTERISTICS - METHOD EMPLOYED

		Distance from ten
10 is largest and is, therefore, assigned rank 10		.00
From 10 to 8 is .95		8 is .95
From 10 to 9 is 1.81		
8 to 9 " 1.24 (.29+.75)		
Average		9 is 1.52
From 10 to 3 is 1.53		
8 to 3 " 1.60 (.65+.95)		
9 to 3 " 1.81 (.29+1.52)		
Average		3 is 1.64
From 10 to 1 is 2.18		
8 to 1 " 1.60 (.65+.95)		
9 to 1 " 2.01 (.49+1.52)		
3 to 1 " 1.93 (.29+1.93)		
Average		1 is 1.93
From 10 to 6 is 1.98		
8 to 6 " 1.60 (.65+.95)		
9 to 6 " 1.81 (.29+1.52)		
3 to 6 " 1.97 (.33+1.64)		
1 to 6 " 2.07 (.14+1.93)		
Average		6 is 1.88
From 10 to 2 is 1.98		
8 to 2 " 2.19 (1.24+.95)		

9 to 2	is	2.25	(.73 + 1.52)
3 to 2	"	2.29	(.65 + 1.64)
1 to 2	"	2.42	(.49 + 1.93)
6 to 2	"	2.29	(.41 + 1.88)

Average

2 is 2.23

From 10 to 4	is	2.59	
8 to 4	"	3.13	(2.18 + .95)
9 to 4	"	3.95	(2.43 + 1.52)
3 to 4	"	3.62	(1.98 + 1.64)
1 to 4	"	3.46	(1.98 + 1.64)
6 to 4	"	2.83	(.95 + 1.88)
2 to 4	"	3.47	(1.24 + 2.23)

Average

4 is 3.29

From 10 to 5	is	2.18	
8 to 5	"	1.81	(.86 + .95)
9 to 5	"	2.01	(.49 + 1.52)
3 to 5	"	2.50	(.86 + 1.64)
1 to 5	"	2.26	(.33 + 1.93)
6 to 5	"	2.53	(.65 + 1.88)
2 to 5	"	2.01	(2.23 + -.22)
4 to 5	"	2.96	(3.29 + -.33)

Average

5 is 2.28

From 10 to 7	is	1.47	
9 to 7	is	1.03	(1.52 + -.49)
8 to 7	"	.88	(.95 + -.07)
6 to 7	"	.53	(1.88 + -1.35)
5 to 7	"	.81	(2.28 + -1.47)
4 to 7	"	1.48	(3.29 + -1.81)
3 to 7	"	1.31	(1.64 + -.33)
2 to 7	"	.99	(2.23 + -1.24)
1 to 7	"	.89	(1.93 + -1.04)

Average

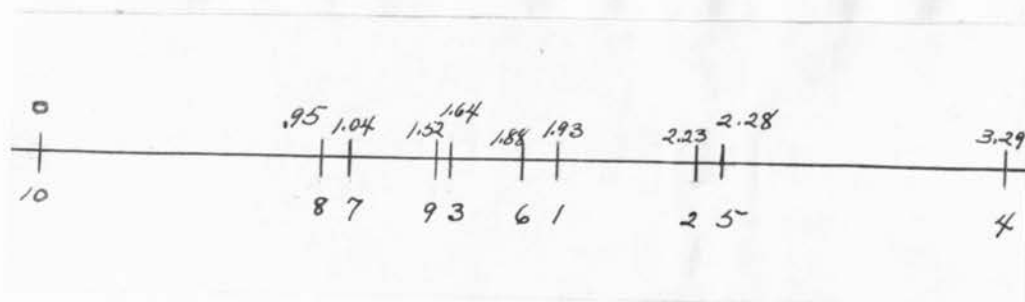
7 is 1.04

The Rank Order of Characteristics as Assigned by 54 Heads of Teacher-Training Departments and Institutions Follows.

10- 8- 7- 9- 3- 6- 1- 2- 5- 4

10	Professionalism	.....at Any Position	"x"
8	Industrial experience and contact	..... .95 above	X
7	Health and appearance	..... 1.04	" x
9	Methods	..... 1.52	" x
3	General Scholarship	..... 1.64	" x
6	Personality	..... 1.88	" x
1	Adaptability and Tact	..... 1.93	" x
2	Executive ability and class management	... 2.23	" x
5	Good character	..... 2.28	" x
4	Knowledge of the subject to be taught	.... 3.29	" x *

*For convenience, a line five and nine sixty-fourths inches is drawn to show this uneven spacing. There being 3.29 units of distance from x to the point farthest from it, we drop all decimal points and assume each unit to be one sixty-fourth of an inch in length. $329 \text{ (units)} \times \frac{1}{64} = \frac{329}{64}$ or 5 and $\frac{9}{64}$ inches. This line is divided to show the characteristics in their positions, according to the P. E. distances shown above.



The numbers 10, 8, 7, etc., have reference to the characteristics as listed above, which characteristics are now seen to be unevenly distributed. They are shown in rank order of importance and given the determined position from an arbitrary zero point of importance.

5. The Combined Judgments of 293 Individuals

The method of handling the data has been described in section four and only the combined judgments will be here treated. Opinion as to what order the named characteristics should take in our consideration of a teacher for a given type of service is shown by the table of P. E. distances and a statement of the rank order derived. The original ratings, together with other intermediate steps, will be found in the Appendix, Pages 75-116.

TABLE EIGHT

P. E. Values

Manual Arts Teacher

	1	2	3	4	5	6	7	8	9	10
1 >	-	-	-	.90	-	-	-	-	-	-
2 >	-	-	-	.73	-	-	-	-	-	-
3 >	.86	1.09	-	1.67	.41	.29	-	-	.11	-
4 >	-	-	-	-	-	-	-	-	-	-
5 >	.18	2.18	-	.49	-	-	-	-	-	-
6 >	.33	.41	-	.86	.37	-	-	-	-	-
7 >	1.24	1.30	.41	1.41	1.24	1.30	-	.03	.65	-
8 >	.82	1.41	.41	2.30	.73	.22	-	-	.49	-
9 >	.69	1.04	-	2.43	.14	.26	-	-	-	-
10 >	1.90	2.08	1.81	2.59	.77	1.19	.73	.90	1.67	-

The Table should be read as follows: Rank 10 to rank 5 is .77; rank 5 to rank 4 is .49, etc.

The order of characteristics, least to greatest importance, is 1- 7- 8- 9- 4- 5- 1- 6- 2- 3, i. e., Professionalism, Health and appearance, Industrial experience or contact, Methods, Knowledge of the subject to be taught, Good character, Adaptability and tact, Personality, Executive ability and class management, General scholarship.

TABLE NINE

P. E. Values

General Industrial Teacher

	1	2	3	4	5	6	7	8	9	10
1 >	-	.45	-	.69	-	-	-	-	-	-
2 >	-	-	-	.41	-	-	-	-	-	-
3 >	.73	1.00	-	.86	.37	.22	-	.45	.14	-
4 >	-	-	-	-	-	-	-	-	-	-
5 >	.29	.33	-	.61	-	-	-	.03	-	-
6 >	.57	.41	-	1.04	.41	-	-	.14	-	-
7 >	1.24	1.30	.57	1.53	1.30	1.35	-	.57	.65	-
8 >	.11	.29	-	1.53	-	-	-	-	-	-
9 >	.65	1.00	-	1.90	.14	.11	-	.61	-	-
10 >	1.98	2.18	1.47	1.74	1.35	1.35	.69	1.74	1.81	-

The order of characteristics in this case is, least to greatest importance, 10-3-2-9-7-4-1-8-6-5, i. e., Professionalism, General scholarship, Executive ability and class management, Methods, Health and appearance, Knowledge of the subject to be taught, Adaptability and tact, Industrial experience or contact, Personality, Good character.

TABLE TEN

P. E. Values

Vocational Shop Teacher

	1	2	3	4	5	6	7	8	9	10
1 >	-	.53	-	.95	-	-	-	1.00	-	-
2 >	-	-	-	1.53	-	-	-	.86	-	-
3 >	1.53	2.30	-	2.78	.73	1.30	.14	2.18	1.09	-
4 >	-	-	-	-	-	-	-	-	-	-
5 >	.03	.37	-	.86	-	-	-	.49	-	-
6 >	.29	.49	-	.35	.11	-	-	.82	-	-
7 >	1.14	1.19	-	1.80	1.41	1.24	-	1.30	.65	-
8 >	-	-	-	1.24	-	-	-	-	-	-
9 >	.49	.73	-	2.43	.11	.11	-	1.41	-	-
10 >	2.18	2.08	.45	2.78	1.30	1.47	.69	2.43	2.08	-

The order of characteristics is 10-6-2-8-5-7-1-9-3-4 i. e., Professionalism, Personality, Executive ability and class management, Industrial experience and contact, Good character, Health and appearance, Adaptability and tact, Methods, General scholarship, Knowledge of the subject to be taught.

TABLE ELEVEN

P. E. Values

Related Subjects Teacher

	1	2	3	4	5	6	7	8	9	10
1 >	-	-	-	1.19	-	-	-	-	-	-
2 >	.03	-	-	1.74	-	-	-	-	-	-
3 >	.77	.65	-	1.35	.03	.03	-	.03	-	-
4 >	-	-	-	-	-	-	-	-	-	-
5 >	.30	.18	-	.90	-	-	-	-	-	-
6 >	.53	.29	-	1.53	.53	-	-	-	-	-
7 >	1.35	1.19	.77	1.98	1.04	1.98	-	.41	.29	-
8 >	.41	.41	-	1.98	.03	.29	-	-	-	-
9 >	.53	.65	.18	2.78	.41	.03	-	.65	-	-
10 >	1.74	2.78	1.74	5.00	2.78	2.78	1.19	1.19	1.53	-

The order of characteristics is 10-8-9-7-6-5-1-4-2-3, i. e., Professionalism, Industrial experience or contact, Methods, Health and appearance, Personality, Good character, Adaptability and tact, Knowledge of the subject to be taught, Executive ability and class management, General scholarship.

The Four Teachers Compared

Assigned order of characteristics by 293 individuals
(Least to greatest importance)

Manual arts teacher	10-7-8-9-4-5-1-6-2-3
General industrial teacher	10-3-2-9-7-4-1-8-6-5
Vocational shop teacher	10-6-2-8-5-7-1-9-3-4
Related subjects teacher	10-8-9-7-6-5-1-4-2-3

These figures are almost impossible of interpretation as they stand but they show that the ten characteristics were not given the same order for the four types of teachers considered. Particulars are more readily shown by the accompanying charts. Figure I, brings out clearly the contrasts among the four types of teachers; and Figure II the comparative values of the several characteristics.

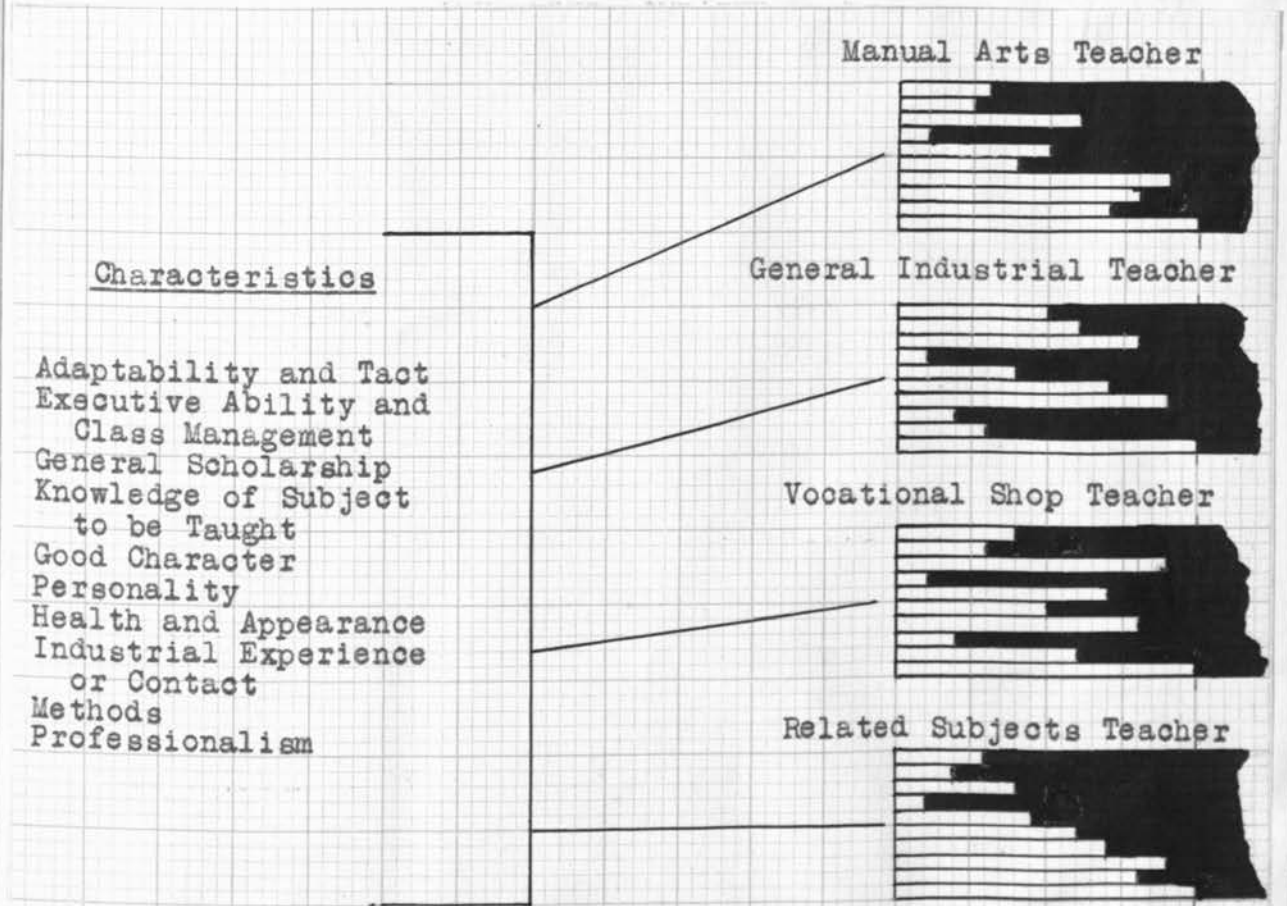
FIGURE I

TYPES OF TEACHERS

GRAPHIC COMPARISON - FOUR RANKINGS

(Characteristics Assumed to be Equidistant)

Rank Order Compared



KEY



Rank Assigned by 293 Persons

Below Arbitrary Zero,
Point of Importance

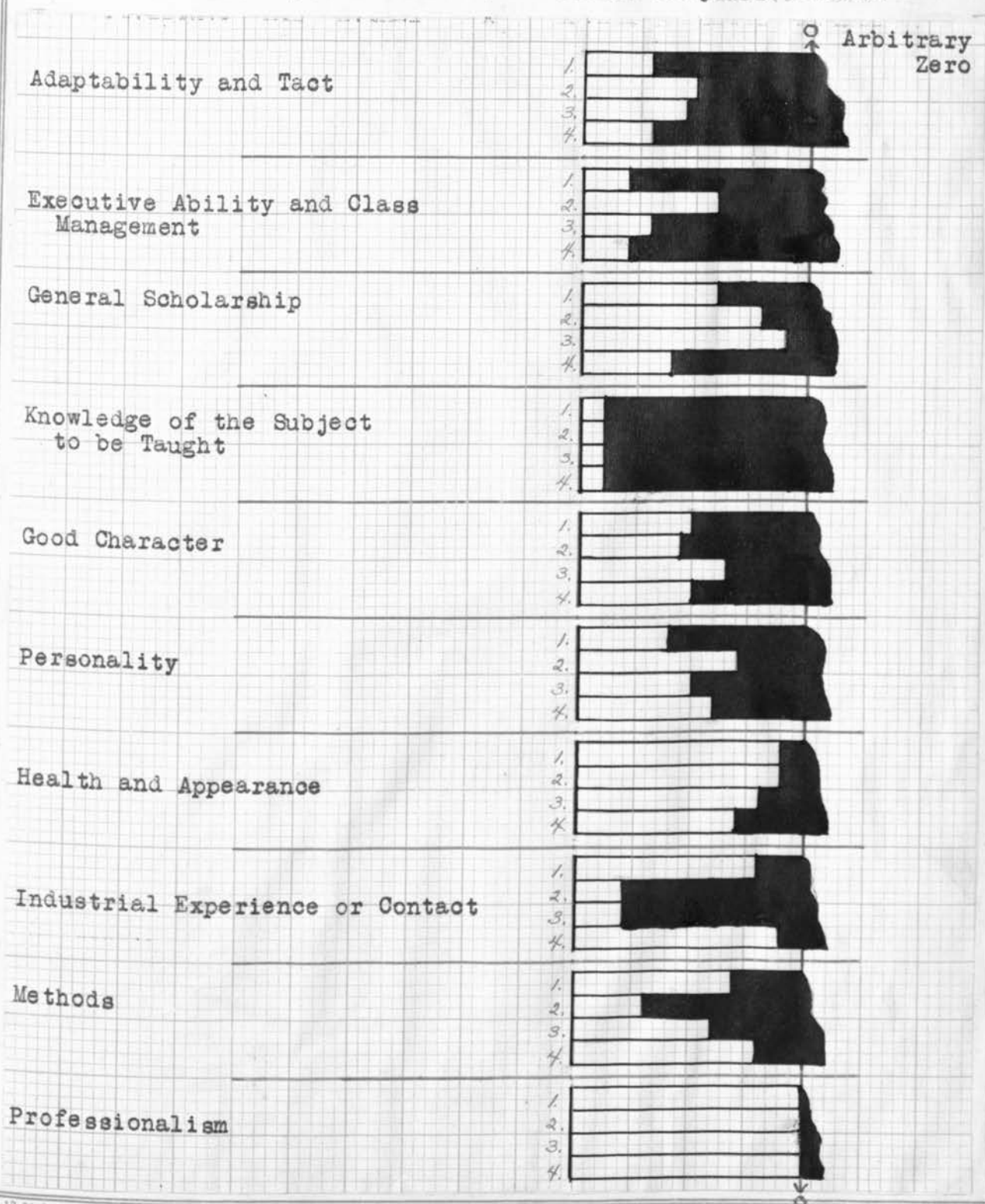
Relative Importance of the Characteristic

FIGURE II

THE CHARACTERISTICS COMPARED

□ Rank, One to Ten (One means first importance) ■ Importance

- 1. Manual Arts Teacher
- 2. General Industrial Teacher
- 3. Vocational Shop Teacher
- 4. Related Subjects Teacher



Adaptability and tact are seen to be about equally necessary for all four types of teachers concerned. (Shaded portions in chart show relative importance of characteristics)

Executive ability and class Management seems not to be quite so essential to success for general industrial work as for the three other types.

General scholarship is not given high rank except for the related subjects teacher.

Knowledge of the subject to be taught is seen to be most important of the ten characteristics for each of the four types of classwork.

Good character is equally important for all, and, as brought out previously, should, perhaps, not have been included in the list of characteristics prepared but, rather, assumed for all in greatest possible measure. Personality, and Health and appearance were credited with lesser importance, judgments being modified here, also, by difficult classification.

Industrial experience or contact are held as highly requisite for the general industrial and the vocational shop teacher.

Methods is given most prominence for the general industrial teacher but is of considerable importance for all.

Professionalism is given lowest rank for all. Here it should be again pointed out that the end position does not signify little or no importance. The scale may well begin at any chosen place, or amount of importance. As was previously mentioned two persons who returned questionnaires were confused

as to the meaning of Professionalism. It must also be borne in mind that this characteristic is comprehended to a considerable extent by several of the other attributes and attainments.

6. Differing Opinions of Four Groups of Persons

Cooperating in the Study

(See Appendix, Pages 102-107 or P. E. Tables from which these several rank orders are derived)

Group A includes 33 state and federal supervisors of industrial and vocational education.

Group B includes 75 city supervisors, cities of 50,000 and more population.

Group C includes 54 heads of industrial and vocational teacher-training departments and institutions.

Group D includes 131 teachers in service and teachers in training, a random sampling, throughout the country.

TABLE TWELVE

Rank Order of Characteristics

Manual Arts Teacher

Assigned by	Rank, least to greatest importance									
	10-	9-	8-	7-	6-	5-	4-	3-	2-	1
Group A	10-	7-	8-	9-	3-	5-	6-	2-	1-	4
" B	10-	8-	7-	9-	3-	5-	1-	2-	6-	4
" C	10-	8-	7-	9-	3-	6-	1-	2-	5-	4
" D	10-	7-	8-	6-	3-	9-	5-	1-	2-	4

General Industrial Teacher

Group A	10-	3-	7-	6-	8-	1-	5-	2-	9-	4
" B	10-	7-	8-	9-	3-	1-	2-	6-	5-	4
" C	10-	7-	3-	9-	6-	8-	1-	2-	5-	4
" D	10-	7-	6-	9-	5-	3-	8-	1-	2-	4

Vocational Shop Teacher

Group	A	10-	7-	3-	6-	2-	1-	5-	9-	8-	4
"	B	10-	3-	7-	9-	1-	5-	6-	2-	8-	4
"	C	10-	3-	7-	1-	6-	9-	5-	2-	8-	4
"	D	10-	7-	3-	6-	9-	1-	2-	8-	5-	4

Related Subjects Teacher

Group	A	10-	7-	6-	9-	8-	3-	1-	5-	2-	4
"	B	10-	7-	8-	9-	2-	3-	1-	5-	6-	4
"	C	10-	7-	8-	2-	6-	1-	9-	3-	5-	4
"	D	10-	7-	8-	6-	5-	9-	3-	2-	1-	4

TABLE THIRTEEN

The Ranking of Characteristics by Four Groups

Characteristics	Group	Manual Arts Teacher	General Industrial Teacher	Vocational Shop Teacher	Related Subjects Teacher
		Rank	Rank	Rank	Rank
Adaptability and tact	A	2	5	5	4
	B	4	5	6	4
	C	4	4	7	5
	D	3	3	5	2
Executive ability and class management	A	3	3	6	2
	B	3	4	3	6
	C	3	3	3	7
	D	2	2	4	3
General scholarship	A	6	9	8	5
	B	6	6	9	5
	C	6	8	9	3
	D	6	5	8	4
Knowledge of the Subject to be taught	A	1	1	1	1
	B	1	1	1	1
	C	1	1	1	1
	D	1	1	1	1
Good character	A	5	4	4	3
	B	5	2	5	3
	C	2	2	4	2
	D	4	6	2	6
Personality	A	4	7	7	8
	B	2	3	4	2
	C	5	6	6	6
	D	7	8	7	7
Health and Appearance	A	9	8	9	9
	B	8	9	8	9
	C	8	9	8	9
	D	9	9	9	9
Industrial experience or contact	A	8	6	2	6
	B	9	8	2	8
	C	9	5	2	8
	D	8	4	3	8
Methods	A	7	2	3	7
	B	7	7	7	7
	C	7	7	5	4
	D	5	7	6	5
Professionalism	A	10	10	10	10
	B	10	10	10	10
	C	10	10	10	10
	D	10	10	10	10

The chart should be read as follows: Adaptability and tact were ranked 2, 4, 4, and 3 in the case of the manual arts teacher by the four groups of those rating, etc.

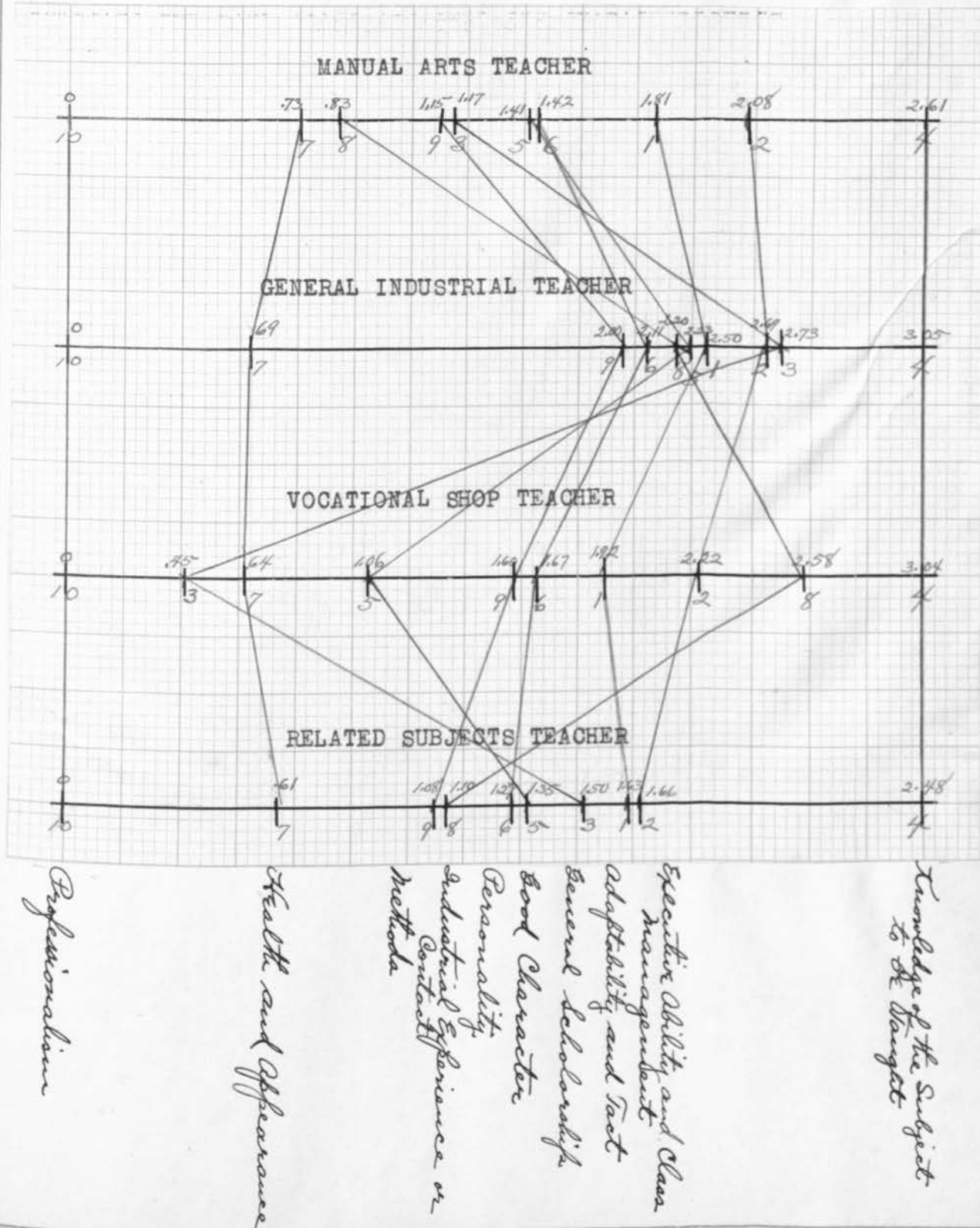
It is interesting to note that the four groups are so nearly in unison in their opinions of the requisites for success in the various kinds of class work that scrutiny of curricula designed by training institutions should find them concerted in attitude toward them. We are forced to the conclusion that curricula once scientifically built will be judged by all with similar standards and that teachers in these special fields are now probably elected and rated by standards approaching uniformity.

The statistical method here employed makes it possible for us to know the situation more definitely still. The figures previously given have assumed the characteristics to be equidistant when given a certain order. They are, however, not so spaced but distribute themselves unevenly. Judgments of placement reached above are not modified to any great extent by these minute findings but our feeling is strengthened that the qualities and attainments used for the means of judgment are such as may be thought of in terms of amount. The accompanying chart, Figure III, shows the requisites for four types of teachers projected on straight lines of equal length and virtually comprising scales, the distances between points being known. The opinions of the 293 judges are here recorded.

Characteristics 10 (Professionalism) and 4 (Knowledge of the subject to be taught) retain identical places throughout. 7 (Health and appearance) and 2 (Executive ability and class management) hold positions quite uniform, while all others travel through wide ranges. The four mentioned, then, are seen to be the most constant requisites for all at their approximate positions

**FIGURE III
PROJECTION OF PLACEMENTS
OF
CHARACTERISTICS**

Key: Figures above the black lines show P. E. distances from an arbitrary zero or the position of least importance; those below indicate the rank order assigned the characteristics.



7. SUMMARY OF CHAPTER TWO

The requisites for success in the various types of industrial and vocational teaching positions are not indetical; they are dissimilar.

The differences are such that standards of fitness may be expressed roughly in definite qualifies and attainments, each in terms of amount.

The requisites can be accurately located with reference to an arbitrary zero so that a scale for rating is possible, the distances between points being known.

All types of persons in this special branch of our profession, namely, supervisors, administrators, and heads of teacher-training departments and institutions think with considerable uniformity upon the qualifications for the various kinds of teachers.

It seems possible now to attempt to evaluate the typical offerings at institutions of training in terms of definite kinds and amounts of preparation. Chapter Three shows such an evaluation.

C H A P T E R T H R E E

Present Two-Year and Four-Year Curricula
for Industrial Teacher-Training Viewed in
the Light of Derived Standards of Fitness

1. THE TYPES OF CURRICULA EXAMINED

Numerous agencies are preparing teachers for industrial schools and classes or increasing the efficiency of men in industrial and vocational class teaching. Conferences are held in various parts of the country upon call of federal supervisory agents. State Boards plan programs of varying intensity and length at convenient points within states. Municipalities inaugurate short courses for evening enrollment by teachers and prospective teachers. Universities, colleges, and normal schools are assisting greatly in the work by regular and summer session offerings, by extension classes, and by correspondence courses. Beside these, there are special institutions of training conducted by private citizens and by organizations, all productive of more men more nearly prepared for these special types of service. It would be almost impossible to evaluate the services of these agencies, either in terms of numbers of persons aided or of the lengths of terms or the breadths of offerings. One has only to conclude that every attempt in some measure succeeds, and that the total effect is an increased interest in industrial classwork and increased understanding of the problems met by those who work in this branch of the profession.

The writer has expressed elsewhere ²⁹ his belief that "...ultimate success in a profession and the time necessary to attain one's greatest usefulness in it are dependent in large measure upon his initial training for the work. The lawyer, the

29. Smith, Homer J. - The Need of Training. pp 214-126
Industrial-Arts Magazine, Vol. 10, June, 1921.

physician, or the engineer who attracts the attention of his fellows is very often known to have been early well grounded in the principles basic to the field. It is appreciated that he rises rapidly through ability to study cases in practice and to make adaptations to new conditions without losing sight of fundamental truths and aims" These considerations point to training by means of well planned curricula and to the spending, by each recruit, of considerable time in an atmosphere of the methods and the problems of the schools. Conferences and courses help, but our schools need teachers of more thorough preparation than can be gained in limited time and through scattered courses. There must be breadth and fullness and unity. The curricula of our universities, normal schools, and special institutions of training should have our first endorsement, because they afford preparation of length and are designed for the attainment of definite ends.

In the following sections we shall attempt an evaluation of representative two-year and four-year curricula, in the light of the standards of fitness previously derived. Twenty-five offerings of each length have been chosen and they afford us knowledge of the typical requirements and make comparison possible. The institutions concerned are located in twenty-nine (29) states of the Union - Alabama, Arizona, Arkansas, Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Maine, Michigan, Minnesota, Mississippi, Nebraska, New Hampshire, New York, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, South Dakota, Tennessee, Texas, Virginia, Washington, West Virginia, and Wisconsin.

The twenty-five four-year curricula used for comparison

are scattered in nineteen states, eleven of them being offered in colleges and universities, eight in technical institutions and agricultural colleges, and six in normal schools. The curricula two years in length were drawn from twenty states, thirteen from normal schools, seven from colleges and universities, and five from technical institutions and agricultural colleges. Thus we are assured that they represent the types of institutions and all parts of the country.

Three-year and five-year curricula have been disregarded because they are few. Offerings less than two years in length have been allowed to pass as worthwhile but as not being designed with sufficient uniformity to permit of comparison. They are, in fact, sets of courses or suggested elective groups, not curricula from which we should expect much return.

Percentages seem best adapted to the purposes of this comparative work and are more easily derived than are total credits or class hours. Systems of credit vary greatly as do the lengths of terms and the corresponding values of the earnings of students toward graduation. In each instance, then, the total necessary hours or credits was found and used as a base for computation. As courses were classified, totals were found for each type of work and these totals were changed to whole per cents of the bases used. While one institution graduates with sixteen units of credit, another exacts 180 by reason of different accounting. Percentage classification gives convenient entries for trustworthy comparison.

The classes into which the courses were grouped for comparison were arbitrarily chosen as most nearly indicative of

the experiences required of candidates for the degree. They are Academic Content, Shop Content, Drawing Content, Methods and Supervision, Observation and Practice, Administration, Educational Psychology, Educational Sociology, and Electives. As an example of the method of classification, complete analysis of one curricula^{um} is here traced. Descriptions of courses, as given in the bulletin, were made use of in all cases where course numbers appeared.

FOUR YEAR CURRICULUM

INDUSTRIAL EDUCATION (ANNUAL TRAINING)

OHIO STATE UNIVERSITY, COLUMBUS, OHIO*

FIRST YEAR

FIRST SEMESTER

English (101)	2
Mathematics (121).....	3
Art (131)	2
American History (101)	3
Engineering Drawing (139)..	4
Survey of Education	1
Military Science	1
Physical Education	2

SECOND SEMESTER

English (104)	2
Mathematics (122)	3
Art (141)	2
American History (102)	3
Engineering Drawing (140) ..	3
Industrial Education (125)..	2
Military Science	1
Physical Education	1

SECOND YEAR

English (133,141, or 145)...	3
Chemistry (105 or 109)	4
Psychology (101)	3
Industrial Education (127)	3
Shopwork (105)	2
Military Science	1
Elective	2

English (142,146 or 133) ...	3
Chemistry (106 or 110)	4
Psychology (102)	3
Industrial Education (128)..	3
Shopwork (115)	2
Military Science	1
Elective	2

THIRD YEAR

Physics (103 or 105)	4
Sociology (101)	3
Psychology (107)	2

Physics (104 or 106)	4
Sociology (102)	3
Psychology (108)	2

* Bulletin of Ohio State University, Columbus, Ohio, Vol. 25, No. 23, April, 1921, pp 26-27.

THIRD YEAR (Continued)

Industrial Education (117) ..2	Industrial Education (118)... 2
" " (133) 2	Industrial Education (134)... 2
" " (129) 3	Elective 3

FOURTH YEAR

History of Education (101) 3	History of Education (102) 3
Prin. & Practice of Ed.(103) 3	Prin. & Practice of Ed.(104) 3
School Administration (101) 3	Industrial Education (112) 3
Industrial Education (111) 3	Industrial Education (132) 3
Shopwork (119) 3	Elective 3

(Total Credits, 133)

Academic Content - 60 credits, 45 per cent of 133 credits.

English 101, 104, 133, and 142 - Mathematics 131 and 122 -
 Art 131 and 141, American History 101 and 102 - Military Science -
 Physical Education - Chemistry 105 and 106 - Psychology 101 and
 102 - Physics 103 and 104 - Sociology 101 and 102.

Shop Content - 22 credits, 16 per cent

Industrial Education 125, 127, 128, 129, 133, and 134 -
 Shopwork 105, 115, and 119.

Drawing Content - 12 credits, 9 per cent

Engineering Drawing 139 and 140 - Industrial Education
 117 and 118.

Methods and Supervision - 10 credits, 8 per cent

Survey of Education - Industrial Education 111, 112,
 and 132.

Observation and Practice - none required.Administration - 15 credits, 12 per cent

History of Education 101 and 102 - Principles and
 Practice of Education 103 and 104 - School Administration 101.

Educational Psychology - 4 credits, 3 per cent

Educational Psychology 107 and 108

Educational Sociology - none requiredElectives - 10 credits, 7 per cent

2. PERCENTAGE CLASSIFICATION OF COURSES IN 25 TWO-YEAR AND 25 FOUR-YEAR CURRICULA

Tables fourteen and fifteen give the classification of courses comprising the fifty curricula that were examined. It will be noted that content courses are much in excess of the professional in all cases. Content Academic refers to work in English, History, Health and Sanitation, Citizenship, Mathematics, Science, Psychology, Economics, etc. Content Shop and Content Drawing mean courses in which theory and practice are given and skills developed through lectures, recitations, and shop and laboratory work. Where titles and descriptions of courses indicated discussion of the technique of teaching these various subjects, they were listed under either Methods and Supervision or Observation and Practice. Other headings are self-explanatory, except that it is necessary to say that the elective column lists both academic and manual courses used for the completion of required numbers of credits.

TABLE FOURTEEN
 PERCENTAGE DISTRIBUTION OF WORK
 IN TWENTY-FIVE
 TWO-YEAR CURRICULA

* No	Content Acad.	Content Shop	Content Draw. & Super.	Methods & Prac.	Obser.	Admin.	Ed. Psy.	Ed. Sociol.	Elect- ive
1	32	15	13	3	15	4	4	-	13
2	25	24	19	10	10	7	5	-	--
3	38	44	5	4	2	5	2	-	--
4	54	18	13	4	4	7	-	-	--
5	28	28	7	17	7	-	7	3	3
6	11	22	11	15	4	-	-	-	37
7	23	26	15	10	5	10	5	-	6
8	6	18	15	9	12	11	11	-	18
9	15	42	16	-	5	8	5	-	9
10	26	22	11	11	11	-	11	-	8
11	30	17	13	13	13	-	5	-	9
12	25	28	-	9	13	2	6	-	17
13	18	44	6	8	6	12	16	-	--
14	70	26	-	-	-	-	-	-	4
15	16	36	12	7	6	7	6	5	5
16	35	25	12	-	22	6	-	-	-
17	20	12	33	12	6	4	5	-	8
18	48	16	10	7	-	4	10	-	5
19	17	38	22	10	3	6	4	-	-
20	18	33	22	9	5	7	5	-	-
21	53	7	6	6	6	15	7	-	-
22	35	21	15	10	5	10	5	-	6
23	25	34	21	4	5	4	7	-	-
24	11	23	36	6	15	-	4	-	4
25	23	31	20	6	12	3	3	2	-
Ave.	28	26	14	7	8	5	5	1	6

*Numbers correspond to institutions listed by states; see Appendix, Pages 114-115. Definite reference to catalogues and bulletins is there made.

TABLE FIFTEEN
 PERCENTAGE DISTRIBUTION OF WORK
 IN TWENTY-FIVE
 FOUR-YEAR CURRICULA

* No	Content Acad.	Content Shop	Content Draw.	Methods & Super.	Obser. & Prac.	Admin.	Ed. Psych.	Ed. Sociol.	Elective
1	40	10	7	4	-	14	5	-	20
2	27	27	10	5	5	9	3	3	11
3	38	33	11	4	8	4	2	-	--
4	16	44	19	3	3	9	3	3	--
5	16	28	11	2	4	10	6	-	25
6	50	26	4	6	1	9	2	-	2
7	26	21	17	10	-	10	4	-	12
8	14	40	10	4	4	8	2	2	16
9	29	43	6	7	1	10	2	2	--
10	57	14	10	4	1	7	1	-	6
11	36	19	6	3	-	3	1	-	32
12	45	25	12	-	3	7	6	2	--
13	32	20	8	5	5	9	5	-	16
14	45	16	9	8	-	12	3	-	7
15	34	18	18	10	-	4	2	-	14
16	37	20	12	2	4	3	2	-	20
17	17	24	10	7	2	8	2	-	30
18	50	14	12	3	6	-	-	2	12
19	46	21	7	6	-	12	4	4	--
20	35	20	5	-	-	20	-	-	20
21	38	20	10	7	2	5	1	-	17
22	50	19	10	21	-	10	1	-	3
23	28	25	10	9	-	5	10	-	15
24	35	25	17	4	3	9	5	2	--
25	46	31	5	8	2	3	2	2	--
Ave.	35	24	10	6	2	8	3	1	11

*Numbers correspond to institutions listed by states; see Appendix, Pages 115-116 . Definite reference to catalogues and Bulletins is there made.

Table Sixteen permits of comparison of the two types of curricula. Averages of the twenty-five schools in each group afford a rough measure of the emphasis placed upon various classes of courses, but the ranges of percentages of each type of work serve further to make clear the differences which the training periods of unequal length make possible. Two-year offerings on the average require slightly less academic content, but we find a greater variance in practice than is found in four-year institutions. In shop content the two-year offering is greater both in average and in ranges, and the same is true of content drawing, observation and practice, and educational psychology. Almost double the amount of election is permitted in the four-year institutions.

TABLE SIXTEEN

Two-Year and Four-Year Curricula Compared

Classes of Courses and the Percentage of Credits Required of Each Class

Classes of Courses	Averages of Credits Required (Per Cents of Total Requirements)		Ranges of Credits Required (Per Cents of Total Requirements)	
	2-yr	4-yr	2-yr	4-yr
Content Academic	28	35	6-70	14-57
Content Shop	26	24	7-44	10-44
Content Drawing	14	10	0-36	4-19
Methods & Supervision	7	6	0-17	0-21
Observation & Practice	8	2	0-22	0- 8
Administration	5	8	0-15	0-20
Educ. Psychology	5	3	0-16	0-10
Electives	6	11	0-37	0-32

The first vertical column, Averages of Credits, is carried from Table Fourteen and the second from Table Fifteen. See distributions of Averages at the ends of these tables. The third and fourth columns, Ranges of Credits, are also derived from these two tables. The smaller and the larger number in each case is the least and the greatest percentage of credits, in the class

of courses named opposite, that is required in any of the twenty-five curricula examined. These ranges are shown so that comparison of the offering of an institution in any type of work may be compared with the average found by examination of twenty-five schools.

The table should be read as follows: The average two-year institution requires 28 per cent of Academic Content work in comparison with 35 per cent required by the average four-year institution. The lowest per cent of Academic Content required in any two-year institution is 6 and the highest 70; in the case of four-year institutions, 14 per cent is the least and 57 per cent is the greatest requirement for this class of courses.

Considering the averages, as modified by the corresponding ranges, we may say that two-year institutions give most stress to shop content, drawing content, methods and supervision, observation and practice, and educational psychology. Four-year institutions give most stress to academic content, administration, and electives. These would be significant facts were comparison being made of two kinds of curricula unlike in respects other than length, for example, offerings in the East and in the West. One having twice the duration of the other, however, we must conclude that the four-year preparatory period is best because it makes possible more experiences and broader training, both general and professional. It is interesting to note, in passing, that the typical offerings in these two definite lengths are very much alike. Our next step is to see in what measure they contribute to the teaching fitness brought out as desirable in earlier pages.

3. EVALUATION

The ten characteristics named as desirable throughout this paper are here listed. It will doubtless be appreciated that they are unequally affected by school training.

1. Adaptability and tact
2. Executive ability and class management
3. General scholarship
4. Knowledge of the subject to be taught
5. Good character
6. Personality
7. Health and appearance
8. Industrial experience or contact
9. Methods
10. Professionalism

Adaptability and tact are dependent upon social contacts and thorough understanding of the situations commonly faced in teaching work. Intercourse with instructors and with large numbers of experienced teachers and cadets, as well as class instruction and readings, modify the preparation of a man to conduct himself wisely when he has left the institution, but the extent of such preparation cannot be easily measured. Good character, personality, executive ability, and health and appearance are all likewise developed and strengthened through life in a school but we have not yet learned to measure them in terms of amount. Courses and counsel and associations contribute also to the growth of professionalism, but this attribute is similarly difficult to gage. It is certain, however, that courses in education are most significant in training for this quality.

The remaining characteristics - class management, general scholarship, knowledge of the subject to be taught, methods, and industrial experience or contact - can be quite readily checked with what a given school or the typical school exacts in training, but in their larger aspects only. We have not gone far yet in detailed evaluation of them. This checking we shall attempt to do with special reference to the four types of teachers under consideration in this study.

THE MANUAL ARTS TEACHER

For this teacher, the five measurable characteristics have been given the following order of importance, by approximately 300 competent individuals.

Knowledge of the subject to be taught
Class management
General scholarship
Methods
Industrial experience or contact

Knowledge of the subject to be taught, for this teacher, has long meant the ability to work with common tools and machines in wood and in some other media as well as a knowledge of the materials used in the school shop. It has meant, also, possession of skill in the use of drawing instruments and the ability to interpret sketches. Approximately 35 per cent of the credits required for graduation from the institutions considered are allotted to shopwork and drawing, which seems a proper recognition of this first-named characteristic.

Class management and Methods are well accounted for by a total of approximately 16 per cent of the time being given to educational psychology, to methods and supervision, and to observation and practice.

General scholarship, so necessary for the maintaining of proper standards of improvement and for desirable correlation of the industrial with the more academic phases of schoolwork, is well provided for by approximately 32 per cent of the time being given to academic content subjects.

Industrial experience or contact being not a school subject, is, however, provided by what may have been learned in institutions before the actual industrial experience was had.

On the other hand, experience gained before enrollment at an institution would make for greater progress in school shop work and for closer organization of materials selected later for courses. A tendency on the part of some schools to require some practical experience supplementary to institutional work is noted. It is wholly possible through cooperative schemes to offer courses rich in contacts with commerce and industry.

Considering the requirements of this special type of classwork we can say that existing curricula are fairly adequate.

GENERAL INDUSTRIAL TEACHER

For this teacher, the measurable characteristics are given a changed order and we have reason, therefore, to suggest a somewhat changed emphasis in the offerings of institutions.

Knowledge of the subject to be taught
 General scholarship
 Class management
 Industrial experience or contact
 Methods

Knowledge of the subject to be taught, for this teacher, presupposes a broader offering of shop and drawing content. The accumulation of credits in one type of shopwork will not give adequate preparation, for the general industrial teacher is expected to offer elementary experiences in a variety of industrial processes and mediums. The training institutions offer a variety of vocational experiences, but whether or not they are required or merely open to election could not be determined in most cases. The amounts of time allotted to shop and drawing courses seem adequate.

Likewise, General scholarship should be a strong factor

in his equipment. He is expected to give not only skills and the knowledge of materials, but his greatest responsibility is the giving of varied, practical experiences and the building up of connections such that his students will better understand the world about them and what men are doing in it. His is a service for social adaptiveness. His offering is generally educational, necessary for all students and sufficient of its kind for the great majority. This responsibility points to much mixed shop-work and drawing, much academic content, more psychology and more sociology than is now offered within the scope of the required courses. It points also to more courses in administration, because he must have a proper conception of the aims and organizations of the various institutions in which he may be employed. He needs to be acquainted with elementary, junior, and senior high school problems.

We may conclude that, for the general industrial teacher, present curricula are not so satisfactory as for the manual arts teacher. Percentages of administration, educational psychology, and educational sociology may well be raised. There must be assurance also of variety in the shop offering, a little of many rather than much of one type of industrial experiences being the ideal. Either the requirement must be more definitely made to this end or the student must choose electives to satisfy this special need.

VOCATIONAL SHOP TEACHER

For this teacher, we have still another order of characteristics and are led to see that emphasis must be placed on somewhat

different courses than in either of the two cases previously discussed.

Knowledge of the subject to be taught
 Industrial experience or contact
 Class management
 Methods
 General scholarship

Knowledge of the subject to be taught in the case of the vocational shop teacher, means that great stress must be laid upon shop and drawing courses. His great necessity is the possession of many skills within a given trade field and the ability quickly and accurately to interpret the most complicated working drawings which may be employed in that field. His preparation in both technical matter and skill, must be intensive, which fact suggests long-continued experiences in the types of work in question. His work is not general in any sense, for he confines his efforts to shopwork in advanced courses of vocational departments and vocational schools, day, evening and part-time. Industrial experience or contact are for him extremely essential and his school shop training fits him admirably to get quickly the additional viewpoints and new processes which the practical outside work has to contribute. If institutions continue to prepare this type of instructor, we may expect a continuance of ^{and} a great extension of a practice now beginning - that of requiring actual trade experience of named kind and quality in lieu of graduation. Cooperative schemes will make possible this same kind of preparation, if the agreements entered into with employers guarantee that the students shall have experiences nearly approaching actual work-world conditions. Class management is for the vocational shop teacher largely shop management, with which he may be familiar, because

he will commonly do more by way of individual instruction than by group teaching.

Methods needs to be less emphasized; not that ability in methods is less important for him, but because there is little variety in the teaching situations with which he can be confronted. His methods work should be definite, narrow in scope, but intensive.

General scholarship has been placed last in order of importance by the three hundred men cooperating in this study and we are, therefore, justified in placing this percentage, for this teacher, at a much lower figure than present curricula show. It should not be thought that vocational shop teachers are handicapped by scholastic attainment; the inference is rather that such attainment contributes little to the tangible results of his efforts. He being in all other respects well prepared for his work, his influence upon students and his value to the school and the profession will rise with the increase of this general scholarship.

RELATED SUBJECTS TEACHER

For this fourth type, we have still another rank order of the five measurable characteristics.

Knowledge of the subject to be taught
 Class management
 General scholarship
 Industrial experience or contact
 Methods

Knowledge of the subject to be taught means, in this case, grasp of mathematics, drawing, science, safety, and such other subjects as are necessary supplements to skill in trade occupations. Considerable time must be allotted for these content courses, because both theoretical and practical work must be taken. Not alone must the knowledge gained be both general and technical but it must

be selected from many fields, including courses in all of the branches of engineering. This means laboratory and shop requirements in addition to text and lecture courses. It involves prerequisites and the exaction of credit in groups of courses, so that the percentages in academic content, shop content, and drawing content must all be high. All technical knowledge must be interpreted in the light of specific vocational demands, industrial experience or contact being, therefore, highly desirable.

Methods, supervision and practice, and administration are more important for the related subjects teacher than for the vocational shop teacher.

The four types of classroom service being widely different in purpose and in the nature of the teacher's duties, hour by hour, at his work, we feel that the typical curriculum of our training institutions is not adequate for the preparation of the four kinds of men needed. It seems well designed for the training of manual arts teachers, because it has been a development toward this definite end. There have been considered, also, the possibilities of election, and the fact that students come to the training institutions with varying amounts of equipment in each field. Still special curricula seem advisable. In view of these judgments it seems proper to suggest the following unequal distributions of coursework for the four types of teachers. The numbers are to be read as per cents of the total credits required for completion under any system of credit accounting. No one is able definitely to state what a proper balance of training should be; neither do the combined opinions set forth in this study render the following percentages worthy of blind

acceptance. To suggest curricular content based upon facts, in some measure scientifically arrived at, is all that was attempted. It is not within the province of this study to recommend details of content for any of the lines of work suggested for the curricula.

MANUAL ARTS TEACHER

Content Acad.	Content Shop	Content Draw.	Methods Super.	Obser. Prac.	Admin.	Ed. Psy.	Ed. Soc.	Electives
25	20	10	10	10	10	3	2	10
GENERAL INDUSTRIAL TEACHER								
28	20	10	5	5	12	6	4	10
VOCATIONAL SHOP TEACHER								
20	35	20	3	3	4	3	2	10
RELATED SUBJECTS TEACHER								
35	20	15	5	5	5	3	2	10

4. SUMMARY OF PART THREE

1. The initial training for any type of industrial or vocational classwork should be of considerable duration. Mixed courses are valuable as agencies for upkeep, but well designed curricula are necessary for introduction to the profession.

2. The percentage distribution of the various classes of courses in present two-year and four-year curricula are similar, more election being permitted at four-year institutions and more attention being given in the two-year schools to methods and practice. Content courses are allotted much more time than

professional courses, in all cases.

3. Present curricula seem adequate and the courses properly stressed for the preparation of manual arts teachers.

4. There seems to be not enough emphasis upon administration and upon related psychology and sociology for the general industrial teacher. There is need also of assurance of extensive rather than intensive offerings in shopwork. Printed curricula do not make this definite requirement nor suggest that electives be chosen to get extensive preparation.

5. For the vocational shop teacher there must be intensive skilled and technical experiences within narrow limits. Methods needs less emphasis, because the teaching later to be done will be largely individual presentation and follow-up-work. General scholarship does not receive a high premium in this instance.

6. For the related subjects teacher we urge much content work, - shop, drawing, and academic - in numerous technical fields. There should be a preponderance of laboratory courses and all theoretical and practical knowledge must be organized for specific vocational needs.

7. One standard curriculum, even though there be generous provision for elective work, will not insure us teachers adequately prepared for four distinct kinds of school service.

8. Suggestive percentage classifications of courses for four types of teaching are listed below. These have been derived by thorough consideration of the service expected of each type of teacher and of the function of the various courses in the training experience.

Classes of Courses	Manual Arts Teacher	General Industrial Teacher	Vocational Shop Teacher	Related Subjects Teacher
Acad. content	25%	26%	20%	35%
Shop "	20	20	35	20
Draw. "	10	10	20	15
Methods and Super.	10	5	3	5
Obser. and Practice	10	5	3	5
Administration	10	12	4	5
Ed. Psy.	3	6	3	3
Ed. Sociol.	2	4	2	2
Electives	10	10	10	10

SUMMARY AND CONCLUSIONS

SUMMARY AND CONCLUSIONS

1. There is confusion among industrial and vocational teachers and administrators, shared, naturally, by their fellow workers in more academic fields, regarding the preparation of teachers of industrial subjects in our schools. We do not think uniformly about the requirements of the varying types of classwork. Until we do reach conclusions more definite and similar, we cannot design correct training experiences so necessary for the right conduct of our courses and for their justification as worthwhile preparation for the young.

2. The following four types of teachers are recognized and most frequently referred to in our literature, and brief explanation of the service of each is made a part of this study.

Manual arts teacher
 General industrial teacher
 Vocational shop teacher
 Related subjects teacher

3. Nine characteristics of fitness are thought to be necessary, in some degree, for all teachers. Brief definitions of these attributes will be found in an earlier section of the study.

Adaptability and tact
 Executive ability and class management
 General scholarship
 Knowledge of the subject to be taught
 Good character
 Personality
 Health and appearance
 Methods
 Professionalism

A tenth characteristic, Industrial experience or contact, was found to be necessary in the consideration of the various

divisions of industrial and vocational classwork. It is a highly desirable characteristic for some types of teachers and cooperative schemes may be employed to give experiences closely paralleling actual, full-time employment.

4. The degree to which any of the foregoing characteristics should be possessed by a teacher is dependent upon the type of work which that teacher is to perform in the schools. The requisites for success in the four kinds of service are not identical. They are sufficiently dissimilar to warrant different kinds and amounts of teacher preparation.

5. All ten characteristics are essential but of varying importance and have been given rank order and relative position, from an arbitrary point of importance, for each of the four kinds of teachers. These rank orders and positions are the combined judgments of almost three hundred persons competent, by reason of experience and positions, to give expert opinions.

6. The differences are such that standards of fitness may be expressed roughly in amounts of the ten characteristics previously named. The orders in which one who is called upon to select a person for a type position should consider these qualifications are given below, the numbers referring to the characteristics as here listed.

1. Adaptability and tact
2. Executive ability and class management
3. General scholarship
4. Knowledge of the subject to be taught
5. Good character
6. Personality
7. Health and appearance
8. Industrial experience or contact
9. Methods,
10. Professionalism

Manual arts teacher	4- 2- 1- 6- 5- 3- 9- 8- 7-10
General industrial teacher	4- 3- 2- 1- 5- 8- 6- 9- 7-10
Vocational shop teacher	4- 8- 2- 1- 6- 9- 5- 7- 3-10
Related subjects teacher	4- 2- 1- 3- 5- 6- 8- 9- 7-10

7. The judgments of groups of individuals similarly employed are found to be in close agreement.

These groups are as follows:

State and federal supervisors of industrial and vocational education.

Supervisors of industrial education in cities of 50,000 and more population

Heads of industrial teacher-training departments and institutions

Teachers-in-service and teachers-in-training

8. The initial training for any type of industrial or vocational teaching should be of considerable duration. Mixed courses are valuable as agencies for upkeep and help on immediate problems, but well-designed curricula are necessary for introduction to the profession.

9. The distribution of varying kinds of courses in present two-year and four-year offerings are similar. More election is permitted at four-year institutions and more attention is given in the two-year curricula to methods and practice. Content courses are allotted much more time than professional courses in all cases.

10. Present curricula do not seem equally well adapted for the preparation of each of the four types of teachers and one standard curriculum, even though generous in elections, seems not to be sufficient.

The needs of manual arts teachers seem to be most closely met at present, probably because existing curricula have been developed with this special end in view.

For the general industrial teacher we feel that more emphasis is necessary upon administration and upon related psychology and sociology. There should be assurance, also, that the shop offering is extensive rather than intensive for this teacher. Present curricula do not make this definite requirement nor suggest that electives be chosen to this end.

The vocational shop teacher may well be offered intensive training within one field or within two allied fields. General scholarship does not receive a high premium in this case and methods may be given in less time because the teaching later to be done will be largely individual presentation rather than group work.

The related subjects teacher seems to need much lecture and laboratory work scattered in various engineering fields so that there would be, in his special curricula, a preponderance of credit in content courses,- academic, shop, and drawing.

11. Suggestive percentage classifications of courses for four types of teaching are shown below for comparison and for checking against present two-year and four-year offerings. The classes of courses were chosen arbitrarily and are the ones used in evaluation of the fifty curricula examined and tabulated in earlier pages. These percentages have been set with full consideration of the service expected from teachers of each type and of the worth of the various kinds of courses in providing needed experience. Quantitative analysis supporting these suggestions was not attempted, as little is now known about the technique of evaluating courses of study in terms of amount of given qualities of fitness. These suggestive amounts of the different kinds of work

seem adapted to curricula of any length.

Kinds of Courses	Manual Arts Teacher	General Industrial Teacher	Vocational Shop Teacher	Related Subjects Teacher	Present Curricula	
					2yr	4yr
Acad. Content	25%	28%	20%	35%	28%	35%
Shop Content	20	20	35	20	26	24
Draw. Content	10	10	20	15	14	10
Methods and Super.	10	5	3	5	7	6
Obser. and Practice	10	5	3	5	8	2
Administration	10	12	4	5	5	8
Ed. Psy.	3	6	3	3	5	3
Ed. Sociol.	2	4	2	2	1	1
Electives	10	10	10	10	6	11

The numbers are to be read as per cents of the total credits required, under any system of credit accounting. The distributions suggested are not worthy of blind acceptance. They are based upon the combined opinions of three hundred competent persons and are to that extent more reliable than personal judgment.

A P P E N D I X

TABLE A

Individual Placement of Characteristics

By 293 Individuals

(As Assigned by State and Federal Supervisors)

Manual Arts Teacher										General Industrial Teacher									
*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
1	6-	1-	9-	2-	4-	7-	3-	8-	5-10	1	10-	1-	8-	3-	6-	5-	4-	7-	2- 9
2	3-	2-	4-	1-	4-	5-	6-10-	7-	8	2	3-	5-	8-	1-	9-	2-	6-	4-	7-10
3	6-	4-	9-	2-	1-	7-	3-10-	5-	8	3	5-	4-	10-	2-	1-	6-	3-	7-	8- 9
4	4-	5-	6-	7-	1-	2-	3-	8-	9-10	4	4-	5-	6-	7-	1-	2-	3-	8-	9-10
5	6-	7-10-	4-	1-	3-	2-	5-	8-	9	5	4-	3-	1-	2-	6-	9-	8-	5-	7-10
6	5-	4-	2-	1-	9-	6-	8-	3-	7-10	6	4-	3-	8-	1-	9-	5-	7-	2-	6-10
7	4-	3-	7-	1-	9-	5-	8-	2-	6-10	7	8-	5-	4-	3-	1-	7-	2-	6-10-	9
8	9-	8-	7-	1-	2-	3-	6-10-	5-	4	8	1-	4-	7-	3-	8-	2-	9-	5-	6-10
9	1-	4-	7-	3-	8-	2-	9-	5-	6-10	9	2-	5-	8-	4-	3-	7-10-	1-	6-	9
10	4-	8-	1-	3-	2-	5-10-	6-	7-	9	10	8-	5-	3-	2-	1-	7-	9-	6-	4-10
11	6-	4-	9-	2-	1-	3-	7-	8-	5-10	11	3-	4-	8-	2-	5-	7-	9-	1-	6-10
12	5-	6-	4-	1-	8-	7-10-	3-	2-	9	12	3-	5-	6-	1-	7-	8-	4-	2-	9-10
13	3-	5-	4-	1-	7-	2-	6-	8-	9-10	13	2-	6-	5-	3-	1-	7-	9-	4-	8-10
14	2-	6-	4-	3-	1-	7-	9-	5-	8-10	14	2-	4-	5-	1-	4-	7-	8-10-	3-	6
15	3-	4-	6-	1-	7-	8-	9-10-	2-	5	15	3-	4-10-	1-	2-	5-	6-	7-	8-	9
16	4-	3-	6-	1-	2-	5-10-	7-	8-	9	16	5-	3-	6-	1-	7-	8-10-	2-	4-	9
17	6-	2-	3-	1-	7-	8-10-	4-	5-	9	17	4-	3-	9-	1-	2-	7-	8-	5-	6-10
18	4-	3-	6-	1-	2-	7-	8-	9-	5-10	18	5-	7-10-	2-	1-	3-	6-	8-	9-	4
19	5-	7-10-	2-	1-	3-	6-	8-	9-	4	19	8-	2-	4-	5-	9-	1-10-	3-	7-	6
20	8-	2-	3-	4-	9-	1-10-	7-	6-	5	20	7-	6-	1-	2-	9-	3-10-	8-	4-	5
21	7-	6-	1-	2-	9-	3-10-	8-	4-	5	21	1-	7-	6-	2-	8-	3-	9-10-	5-	4
22	1-	3-	5-	2-	7-	4-	9-10-	3-	6	22	8-	7-	9-	5-	3-	2-	1-	4-	6-10
23	8-	7-	9-	4-	3-	2-	1-	5-	6-10	23	6-	3-	7-	1-	5-	8-	9-	2-	4-10
24	7-	2-	4-	1-	6-	8-	9-	3-	5-10	24	1-	3-	8-	2-	4-	5-	9-	7-	6-10
25	2-	6-	7-	1-	3-	4-	9-	8-	5-10	25	7-	8-10-	1-	2-	4-	6-	5-	3-	9
26	7-	6-10-	1-	2-	4-	8-	5-	3-	9	26	6-	4-10-	1-	5-	7-	8-	3-	2-	9
27	3-	4-	7-	1-	5-	6-	8-10-	2-	9	27	5-	9-	8-	2-	1-	4-	7-	3-	9-10
28	6-	7-	4-	2-	1-	5-	8-	3-	9-10	28	6-	5-	7-	4-	8-	9-10-	3-	1-	2
29	4-	6-	7-	5-	8-	9-10-	3-	1-	2	29	5-	6-	7-	1-	9-	4-	8-	2-	3-10
30	2-	6-	5-	1-	8-	3-	7-	9-	4-10	30	5-	4-	6-	3-	1-	7-	8-	2-	9-10
31	7-	3-	6-	2-	1-	5-	8-	4-	9-10	31	2-	9-	8-	1-	7-	6-	5-	3-	4-10
32	2-	5-	6-	1-	7-	8-	9-	3-	4-10	.....								

*** etc.- The ten requisites, left to right.

(1) Adaptability and Tact, (2) Executive Ability and Class Management, (3) General Scholarship, (4) Knowledge of the Subject to be Taught, (5) Good Character, (6) Personality, (7) Health and Appearance, (8) Industrial Experience or Contact, (9) Methods, and (10) Professionalism.

(As Assigned by City Supervisors of Industrial and Vocational Education, Cities of 50,000 population)

1	5-3-4-1-6-2-8-7-9-10	1	2-3-5-4-6-1-8-7-9-10
2	4-3-6-5-2-1-8-9-7-10	2	4-3-8-5-2-1-9-6-7-10
3	2-6-4-3-5-1-7-8-10-9	3	2-4-9-3-7-1-8-5-6-10
4	4-2-8-1-5-3-6-9-7-10	4	4-2-8-1-5-3-6-9-7-10
5	7-2-3-1-4-5-6-9-8-10	5	1-2-7-6-3-4-5-9-8-10
6	1-4-6-3-7-2-8-10-5-9	6	3-4-6-1-7-8-9-2-5-10
7	2-1-8-6-4-3-7-9-5-10	7	2-1-10-7-5-4-8-6-3-9
8	5-3-7-1-6-2-8-4-9-10	8	1-2-6-4-8-3-9-5-7-10
9	2-3-4-5-6-1-7-8-9-10	9	3-6-7-4-8-1-9-2-10-5
10	6-7-4-1-5-2-8-9-3-10	10	3-6-2-1-7-8-9-5-4-10
11	3-4-6-1-7-5-8-9-2-10	11	5-4-8-1-7-6-9-2-3-10
12	5-4-3-6-2-1-7-10-9-8	12	5-4-3-6-2-1-7-10-9-8
13	6-5-2-3-1-4-7-10-8-9	13	6-5-2-3-1-4-7-10-8-9
14	7-10-9-6-1-2-3-8-5-4	14	6-7-10-8-1-2-3-5-9-4
15	6-4-5-8-1-2-3-10-7-9	15	4-5-8-6-1-2-3-7-9-10
16	3-1-7-9-4-6-5-10-2-8	16	2-1-7-9-4-3-5-10-6-8
17	4-2-5-1-10-9-7-5-3-8	17	2-1-6-3-7-5-9-8-4-10
18	4-6-7-1-5-2-8-3-9-10	18	2-6-8-1-4-3-9-5-7-10
19	4-7-8-5-2-1-3-6-9-10	19	8-7-4-6-2-1-3-5-9-10
20	6-4-2-1-9-8-7-5-3-10	20	1-2-3-4-5-6-7-8-9-10
21	1-2-3-4-5-6-7-8-9-10	21	4-3-10-1-5-6-8-2-7-9
22	5-1-10-2-4-3-6-7-9-8	22	3-2-7-1-8-5-9-4-6-10
23	6-3-9-8-1-2-7-4-5-10	23	6-2-4-1-5-3-7-8-9-10
24	5-3-9-1-6-7-8-2-4-10	24	5-4-3-2-7-8-6-1-9-10
25	6-2-1-3-9-7-8-10-5-4	25	4-7-10-3-1-8-5-6-9-2
26	8-7-10-3-1-5-4-6-9-2	26	7-6-3-2-1-5-8-4-10-9
27	5-4-8-3-1-2-7-9-6-10	27	2-1-4-3-9-8-10-6-5-7
28	7-6-3-2-1-5-8-9-10-4	28	7-3-6-2-1-10-9-4-5-8
29	2-1-4-6-9-8-10-7-3-5	29	1-2-3-6-7-4-10-5-9-8
30	4-7-2-3-1-10-9-8-5	30	5-4-10-1-9-6-8-2-3-7
31	1-8-3-2-10-4-5-6-9-8	31	7-2-4-1-6-9-8-10-3-5
32	5-3-8-1-10-4-9-6-2-7	32	5-6-7-1-2-3-4-8-9-10
33	7-2-4-1-6-9-8-10-3-5	33	1-5-7-6-8-2-9-4-3-10
34	5-6-7-1-2-3-4-8-9-10	34	2-8-6-1-9-4-7-3-5-10
35	1-4-7-6-8-2-9-5-3-10	35	7-2-5-1-4-9-6-10-3-8
36	3-6-8-1-9-5-7-4-2-10	36	2-8-5-6-1-3-4-7-9-10
37	7-2-5-1-4-9-6-10-3-8	37	5-3-6-2-7-1-10-4-8-9
38	2-7-5-6-1-3-4-8-9-10	38	2-5-4-3-6-1-7-9-8-10
39	4-3-5-2-6-1-10-9-7-8	39	5-3-6-1-7-8-10-2-4-9
40	3-2-4-5-6-1-7-10-8-9	40	4-5-3-9-1-2-6-10-7-8
41	3-2-6-1-8-9-10-5-4-7	41	5-4-8-6-1-2-3-7-9-10
42	4-3-7-6-1-2-5-9-8-10	42	7-4-8-2-1-6-9-3-5-10
43	5-4-6-7-1-2-3-8-9-10	43	10-4-8-2-1-3-9-7-6-5
44	8-5-4-2-1-7-9-6-3-10	44	6-7-5-4-1-3-2-8-9-10
45	10-4-8-2-1-3-9-7-6-5	45	8-9-7-1-2-3-4-10-5-6
46	6-5-7-4-1-3-2-9-8-10	46	6-2-5-3-1-8-7-4-9-10
47	8-7-6-1-2-3-4-10-5-9	47	5-6-8-4-1-2-3-7-10-9
48	5-2-4-3-1-7-6-8-9-10	48	9-7-5-1-3-2-10-4-6-8
49	3-2-5-1-8-7-9-4-10-6	49	4-5-6-1-3-2-7-8-9-10
50	5-7-4-3-1-2-9-6-8-10	50	2-1-10-4-6-7-9-5-3-8
51	9-8-4-1-3-2-10-5-6-7	51	2-7-6-4-9-5-10-1-3-8
52	4-5-6-1-3-2-7-10-8-9	52	4-2-6-3-1-7-8-9-5-10

53	3-2-10-1-6-7-9-5-4-8
54	3-7-6-4-9-5-10-2-1-8
55	4-2-6-3-1-7-8-9-5-10
56	5-4-6-2-7-1-9-10-3-8
57	7-3-8-1-5-2-6-10-4-9
58	2-6-9-4-3-1-8-7-5-10
59	7-3-5-1-2-8-9-4-6-10
60	2-3-4-1-5-6-8-10-7-9
61	5-6-4-7-1-3-2-8-9-10
62	4-5-7-2-3-1-6-9-8-10
63	1-2-5-3-7-4-6-10-8-9
64	6-4-7-5-1-2-3-8-9-10
65	9-8-7-2-1-3-6-4-5-10
66	2-1-9-3-8-4-10-5-6-7
67	3-2-6-5-1-4-9-7-10-8
68	2-3-4-1-6-7-8-9-5-10
69	8-4-5-2-7-1-9-6-3-10
70	7-8-4-9-1-6-5-10-3-2
71	5-2-3-1-8-9-7-4-6-10
72	10-6-4-2-1-5-9-3-7-8
73	7-1-3-2-9-6-8-4-5-10
74	4-5-3-2-1-6-7-8-10-9
75	4-5-7-6-1-2-3-10-8-9

53	5-4-6-2-7-1-9-10-3-8
54	2-8-9-3-4-1-7-6-5-10
55	7-4-5-1-2-8-9-3-6-10
56	2-3-4-1-7-6-10-5-8-9
57	6-8-7-4-1-3-2-5-9-10
58	6-7-5-2-3-1-9-4-8-10
59	2-1-9-3-8-6-7-4-5-10
60	7-4-8-5-1-2-3-6-9-10
61	8-5-2-6-1-3-7-9-4-10
62	3-2-5-1-9-8-10-4-6-7
63	3-2-6-5-1-4-9-7-10-8
64	5-6-4-1-7-8-9-3-2-10
65	7-10-6-9-1-4-5-8-3-2
66	10-6-4-2-1-5-9-3-7-8
67	7-1-3-2-9-6-8-4-5-10
68	4-5-3-2-1-6-7-8-10-9
69	5-4-6-7-1-2-3-10-8-9

(As Assigned by Heads of Industrial and Vocational Teacher-Training Departments and Institutions)

1	6-4-7-1-3-5-2-9-8-10
2	2-1-7-3-4-5-6-8-9-10
3	3-4-9-1-10-2-7-5-6-8
4	6-3-7-4-1-2-9-10-5-8
5	5-4-6-1-7-10-8-2-3-9
6	2-3-8-4-7-1-5-9-6-10
7	9-2-6-1-5-3-7-8-4-10
8	8-7-5-4-1-2-3-10-6-9
9	6-5-9-1-3-4-7-10-2-8
10	4-2-8-1-6-3-9-7-10-5
11	7-5-6-4-1-2-3-8-9-10
12	5-2-4-3-1-8-9-6-7-10
13	5-3-4-2-1-7-9-8-6-10
14	5-4-6-3-2-1-8-7-9-10
15	5-1-4-7-3-2-6-10-9-8
16	5-3-4-1-6-7-9-2-8-10
17	1-6-9-2-5-7-8-3-4-10
18	3-8-7-4-1-5-6-2-9-10
19	4-1-3-2-6-5-10-9-8-7
20	5-3-1-2-7-8-9-6-4-10
21	5-3-4-1-8-7-9-6-2-10
22	4-2-5-1-6-7-8-3-9-10
23	6-8-5-1-2-3-4-9-7-10
24	5-6-4-2-7-1-3-8-9-10
25	8-7-3-2-1-9-10-4-5-6
26	3-4-10-1-8-7-6-2-5-9
27	5-3-6-4-1-2-8-10-7-9
28	7-5-3-1-4-8-9-6-2-10
29	6-4-8-1-7-2-9-5-3-10

1	6-4-7-1-3-5-2-9-8-10
2	1-2-6-7-3-4-5-8-9-10
3	6-3-7-4-1-2-9-10-5-8
4	4-3-5-1-7-10-8-2-6-9
5	4-5-8-1-7-3-6-9-2-10
6	2-5-7-1-6-3-8-2-4-10
7	8-7-5-4-1-2-3-9-6-10
8	7-6-10-1-3-4-8-5-2-9
9	5-2-8-1-6-4-9-3-10-7
10	7-5-4-6-1-2-3-9-8-10
11	5-3-4-2-1-8-9-6-7-10
12	2-5-4-3-1-7-9-8-6-10
13	5-3-9-4-2-1-4-6-8-10
14	8-1-2-4-3-6-7-5-9-10
15	1-5-4-2-6-7-9-3-5-10
16	1-6-9-2-5-7-8-3-4-10
17	4-2-3-1-6-5-10-7-8-9
18	4-2-3-1-6-5-10-7-8-9
19	4-5-1-3-8-9-6-2-9-10
20	5-4-7-1-9-8-10-3-2-6
21	4-2-5-1-6-7-8-3-9-10
22	7-9-5-1-2-3-4-6-8-10
23	6-5-2-1-4-3-8-9-7-10
24	6-5-3-2-1-9-10-4-7-8
25	4-5-3-1-9-6-7-2-8-10
26	5-3-6-4-1-2-8-10-7-9
27	8-4-7-1-5-9-6-2-3-10
28	4-5-9-1-8-6-7-2-3-10
29	9-6-4-1-7-5-8-3-2-10

30	9- 5- 4- 1- 6- 2- 8- 7- 3-10	30	4- 5- 3- 1- 9- 6- 7- 2- 8-10
31	3- 4-10- 1- 8- 7- 6- 2- 5- 9	31	2- 4- 6- 1- 3- 5- 8- 9- 7-10
32	2- 4- 6- 1- 3- 7- 8- 9- 5-10	32	4- 1- 8- 6- 2- 7- 3- 5- 9-10
33	4- 1- 6- 5- 2- 7- 3- 8- 9-10	33	6- 5- 3- 2- 7- 8- 9- 1- 4-10
34	2- 3- 4- 1- 5- 6- 7-10- 8- 9	34	5- 3- 2- 1- 4- 8- 9- 7- 6-10
35	7- 2- 6- 1- 4- 8- 9- 5- 3-10	35	8- 6- 4- 3- 1- 2- 5- 7- 9-10
36	8- 6- 4- 3- 1- 2- 5- 7- 9-10	36	5- 4- 7- 6- 1- 2-10- 8- 3- 9
37	4- 5- 9- 3- 1- 2- 6- 8- 7-10	37	4- 5-10- 1- 7- 6- 9- 3- 2- 8
38	5- 3- 9- 2- 7- 4- 8-10- 1- 6	38	6- 3- 9- 1- 2- 5- 7-10- 4- 8
39	6- 3- 9- 1- 2- 5- 7-10- 4- 8	39	4- 3- 8- 5- 6- 7- 9- 1- 2-10
40	4- 7- 6- 3- 5- 8- 9- 1- 2-10	40	9- 8- 3- 1- 7- 6-10- 2- 5- 4
41	9- 8- 1- 3- 7- 5-10- 2- 4- 6	41	3- 7- 9- 4- 1- 2- 8- 5- 6-10
42	3- 6- 7- 4- 1- 2- 8- 9- 5-10	42	4- 1- 5- 2- 8- 3- 7- 9- 6-10
43	4- 1- 5- 2- 8- 3- 7- 9- 6-10	43	5- 6- 9- 7- 3- 1- 2- 4- 8-10
44	5- 7- 9- 6- 3- 1- 2- 4- 8-10	44	10- 9- 6- 3- 1- 5- 8- 4- 7- 2
45	10- 7- 5- 3- 1- 8- 9- 4- 6- 2	45	4- 3- 1- 2- 7- 9-10- 5- 6- 8
46	9- 3- 2- 1- 6- 8- 7- 5- 4-10	46	1- 4- 6- 5- 2- 9- 8- 7- 3-10
47	1- 4- 8- 5- 2- 9- 7- 6- 3-10	47	4- 3- 9- 2- 1- 7- 8- 5- 6-10
48	6- 4- 3- 2- 1- 9- 7- 9- 5-10	48	4- 2- 7- 3- 1- 5- 6-10- 9- 8
49	4- 2- 7- 3- 1- 5- 6-10- 9- 8	49	6- 7- 4- 3- 1- 2- 8- 5- 9-10
50	5- 4- 8- 3- 1- 2- 7- 6- 9-10	50	2- 7- 6- 1- 4- 5- 9- 3- 8-10
51	3- 6- 5- 1- 2- 4- 8- 9- 7-10	51	5- 6- 8- 3- 1- 9- 2- 4- 7-10
52	5- 6- 4- 3- 1- 9- 2-10- 7- 8	52	1- 5- 7- 3- 8- 2-10- 4- 6- 9
53	1- 4- 6- 3- 8- 2-10- 5- 7- 9	53	9- 7- 8- 3- 1- 6-10- 5- 4- 2
54	8- 7- 5- 3- 1- 6-10- 9- 4- 2	54	.....

(As Assigned by Teachers in Service and Teachers in Training. Random Sampling, throughout the Country)

1	5- 2- 6- 4- 1- 7- 3-10- 8- 9	1	7- 3-10- 2- 1- 8- 4- 5- 6- 9
2	7- 4- 5- 1- 9- 8-10- 3- 2- 6	2	6- 3- 5- 2- 9- 8-10- 4- 1- 7
3	7-10- 5- 9- 3- 6- 4- 8- 2- 1	3	5- 2- 8- 3- 7- 1- 6- 4-10- 9
4	9- 7- 6- 5- 2- 4- 1-10- 8- 3	4	10- 6- 5- 9- 2- 3- 1- 7- 8- 4
5	5- 8- 7- 2- 1- 4-10- 3- 6- 9	5	5- 8- 7- 2- 1- 4-10- 3- 6- 9
6	9- 7- 8- 5- 1- 4- 2-10- 6- 3	6	9- 7- 8- 5- 1- 4- 2-10- 6- 3
7	6- 4- 9- 2- 1- 3- 7- 8- 5-10	7	4- 8- 9- 2- 1- 5-10- 3- 6- 7
8	3- 2- 6- 1- 8- 9-10- 5- 4- 7	8	5- 3- 6- 1- 7- 8-10- 2- 4- 9
9	3- 2- 6- 1- 8- 9-10- 5- 4- 7	9	5- 3- 6- 1- 7- 8-10- 2- 4- 9
10	3- 2- 6- 1- 8- 9-10- 5- 4- 7	10	9- 6- 8- 2- 4- 1- 5- 7- 3-10
11	0- 6- 8- 2- 4- 1- 5- 7- 3-10	11	4- 3- 5- 1- 8- 9-10- 2- 6- 7
12	5- 4- 6- 2- 7- 9- 8- 1- 3-10	12	9- 4- 8- 2- 6- 1- 5- 7- 3-10
13	6- 8- 3- 2- 5- 1- 4-10- 7- 9	13	2- 4- 6- 5- 8- 1-10- 7- 3- 9
14	3- 2- 6- 1- 8- 9-10- 5- 4- 7	14	5- 3- 6- 1- 7- 8-10- 2- 4- 9
15	5- 1- 6- 3- 8- 2- 9- 4- 7-10	15	4- 1- 7- 2- 8- 9-10- 3- 5- 6
16	5- 1- 4- 2-10- 8- 9- 3- 6- 7	16	4- 3- 2- 1- 9- 8- 7- 5- 6-10
17	5- 3- 1- 2- 8- 9- 7- 4- 6-10	17	5- 3- 6- 1- 7- 8-10- 2- 4- 9
18	5- 3- 4- 1- 8- 7- 9- 2- 6-10	18	4- 3- 2- 1- 9- 8- 7- 5- 6-10
19	3- 2- 6- 1- 8- 9-10- 5- 4- 7	19	5- 2- 3- 1- 9- 6- 8- 7- 4-10
20	4- 1- 3- 2- 5- 7- 9- 6- 8-10	20	5- 2- 3- 1- 9- 6- 8- 7- 4-10
21	5- 1- 7- 2- 3- 4-10- 9- 6- 8	21	5- 3- 6- 1- 7- 8-10- 2- 4- 9
22	5- 2- 3- 1- 8- 7- 9- 4- 6-10	22	4- 3- 2- 1- 9- 8- 7- 5- 6-10
23	4- 1- 5- 2- 6- 7- 8- 9- 3-10	23	7- 3- 2- 1- 9- 8- 4- 5- 6-10
24	3- 2- 6- 1- 8- 9-10- 5- 4- 7	24	6- 2- 4- 1- 8- 9- 7- 3- 5-10
25	3- 4- 8- 1- 2- 5- 7- 9- 6-10	25	4- 3- 2- 1- 8- 7-10- 5- 9- 6
26	6- 5- 7- 1- 2- 3- 4- 9- 6-10	26	5- 1- 2- 4- 8- 7- 9- 6- 3-10
27	3- 4- 2- 1- 7- 6- 8- 9- 5-10	27	7- 1- 9- 2- 3- 4- 6- 5- 8-10

28	4- 3- 6- 2- 1- 5- 9- 8- 7-10	28	5- 3- 6- 1- 7- 8-10- 2- 4- 9
29	3- 2- 6- 1- 8- 9-10- 5- 4- 7	29	5- 2- 3- 1- 9- 6- 8- 7- 4-10
30	3- 4- 5- 2- 1- 8- 9- 6- 7-10	30	4- 3- 2- 1- 9- 7- 8- 5- 6-10
31	4- 3- 5- 2- 1-10- 7- 6- 9- 8	31	5- 3- 4- 1- 8- 7- 9- 2- 6-10
32	4- 8- 5- 1-10- 9- 8- 6- 3- 7	32	4- 2- 9- 1- 6- 7- 8- 5- 3-10
33	3- 2- 6- 1- 8- 9-10- 5- 4- 7	33	5- 3- 6- 1- 7- 8-10- 2- 4- 9
34	2- 6-10- 1- 3- 4- 5- 7- 8- 9	34	5- 2- 3- 1- 9- 6- 8- 7- 4-10
35	1- 4- 3- 2- 8- 9-10- 5- 6- 7	35	3- 5- 8- 1- 2- 6- 9- 4- 7-10
36	7- 3-10- 4- 1- 2- 8- 9- 5- 6	36	8- 6- 9- 1- 2- 3- 4- 5- 7-10
37	5- 1-10- 2- 6- 8- 9- 3- 4- 7	37	2- 4- 5- 1- 9- 6-10- 3- 7- 8
38	3- 2- 6- 1- 8- 9-10- 5- 4- 7	38	5- 4- 7- 2- 1- 6- 9- 3- 8-10
39	3- 6- 7- 4- 8- 9-10- 1- 2- 5	39	5- 2- 7- 4- 1- 3- 8- 6- 9-10
40	2- 1- 5- 3- 8- 7- 9- 6- 4-10	40	5- 3- 6- 1- 7- 8-10- 2- 4- 9
41	4- 2- 6- 1- 8- 3- 7- 5- 9-10	41	5- 2- 3- 1- 9- 6- 8- 7- 4-10
42	2- 1- 6-10- 7- 5- 8- 9- 3- 4	42	8- 3- 6- 2- 1- 7- 5- 4-10- 9
43	6- 1- 7- 2- 9- 8-10- 4- 3- 5	43	5- 3- 9- 1-10- 8- 7- 2- 4- 6
44	3- 2- 6- 1- 8- 9-10- 5- 4- 7	44	7- 6-10- 1- 3- 4- 5- 2- 8- 9
45	4- 2- 3- 1- 8- 5-10- 9- 7- 6	45	7- 2- 5- 1- 6- 8- 9- 3- 4-10
46	2- 8-10- 9- 7- 6- 3- 5- 1- 4	46	5- 3- 6- 1- 7- 8-10- 2- 4- 9
47	3- 1- 6- 2- 8- 5-10- 4- 7- 9	47	1- 4- 6- 2- 8- 9-10- 3- 5- 7
48	2- 3- 9- 1- 5- 8-10- 6- 4- 7	48	8- 5- 9- 2- 1- 3-10- 4- 6- 7
49	4- 1- 9- 3- 8- 2- 5-10- 7- 6	49	2- 1- 9- 4- 6- 8-10- 5- 3- 7
50	3- 1- 6- 4- 5- 7- 8- 2- 9-10	50	4- 3- 5- 6- 8- 9-10- 1- 2- 7
51	4- 1- 9- 2- 7- 3-10- 8- 5- 6	51	3- 1- 9- 4- 6- 7- 8- 5- 2-10
52	2- 1- 8- 3- 7- 5- 6- 9- 4-10	52	4- 2- 6- 1- 8- 3- 7- 5- 9-10
53	3- 2- 6- 1- 8- 9-10- 5- 4- 7	53	5- 3- 6- 1- 7- 8-10- 2- 4- 9
54	2- 1- 7- 3- 6- 4- 5- 9- 8-10	54	3- 1-10- 2- 8- 7- 6- 4- 9- 5
55	1-10- 5- 2- 4- 7- 8- 9- 3- 6	55	6- 5- 1- 3- 8- 7-10- 2- 4- 9
56	5- 3- 9- 1- 8- 2-10- 7- 4- 6	56	6- 8- 1- 2- 4- 3- 9-10- 5- 7
57	9-10- 5- 3- 6- 8- 7- 2- 4- 1	57	3- 1- 2-10- 8- 5- 4- 7- 6- 9
58	3- 2- 6- 1- 8- 9-10- 5- 4- 7	58	4- 1- 5- 2- 8- 9-10- 3- 7- 6
59	4- 3- 5- 1- 7- 2- 8-10- 6- 9	59	4- 3- 7- 2- 5- 9-10- 8- 6- 4
60	5- 1- 6- 3- 8- 9-10- 2- 4- 7	60	6- 1- 8- 3- 7- 2- 9- 4- 5- 6
61	3- 2- 9- 1- 5- 6- 7-10- 4- 8	61	5- 3- 6- 1- 7- 8-10- 2- 4- 9
62	1- 3- 4- 2- 6- 5- 7- 8-10- 9	62	3- 1- 5- 4- 6- 7- 8- 2- 9-10
63	1- 3-10- 2- 9- 6- 8- 4- 7- 5	63	7- 3- 9- 2- 5- 4-10- 1- 8- 6
64	3- 2- 6- 1- 8- 9-10- 5- 4- 7	64	2- 1- 4- 3- 7- 8- 6- 9- 5-10
65	3- 4-10- 1- 6- 5- 3- 7- 2- 9	65	5- 3- 6- 1- 7- 8-10- 2- 4- 9
66	1- 3-10- 2- 9- 6- 8- 4- 7- 5	66	2- 1- 9- 4- 5- 3- 6- 7- 8-10
67	1- 2- 3- 9- 4-10- 8- 5- 6- 7	67	1- 6-10- 2- 3- 8- 7- 3- 5- 9
68	1- 3- 4- 5- 2- 8- 9- 7- 6-10	68	1- 8- 9- 7- 6- 2-10- 8- 4- 5
69	4- 5- 3- 2- 1-10- 9- 7- 6- 8	69	9-10- 5- 3- 6- 8- 7- 2- 4- 1
70	3- 2- 6- 1- 8- 9-10- 5- 4- 7	70	5- 3- 6- 1- 7- 8-10- 2- 4- 9
71	1- 3- 6- 4- 5- 7- 8- 9- 2-10	71	5- 3- 6- 1- 7- 8-10- 2- 4- 9
72	1- 3- 7- 2- 6- 4- 9- 8- 5-10	72	2- 3- 7- 4- 6- 5- 9- 1- 8-10
73	1- 3- 7- 4- 2- 5- 8- 9- 6-10	73	4- 2- 5- 6- 8- 9-10- 1- 3- 7
74	3- 2- 6- 1- 8- 9-10- 5- 4- 7	74	1- 2- 5- 3- 6- 7- 8- 9- 4-10
75	2- 3- 9- 1- 6- 5- 8- 7- 4-10	75	5- 3- 6- 1- 7- 8-10- 2- 4- 9
76	1- 2- 9- 3- 6- 5- 7- 8- 4-10	76	1- 2- 3- 4- 5- 6- 7- 8- 9-10
77	2- 1- 7- 4- 8- 5- 9- 8- 3-10	77	2- 1-10- 4- 9- 5- 8- 3- 6- 7
78	3- 1- 6- 2- 4- 5- 8- 9- 7-10	78	2- 1-10- 4- 6- 5- 3- 1- 7-10
79	2- 3- 5- 1- 4- 7- 6- 9- 8-10	79	2- 1-10- 4- 9- 5- 8- 3- 6- 7
80	1- 3- 6- 2- 5- 8-10- 4- 7- 9	80	1- 3- 5- 2- 6- 7- 8- 4- 9-10
81	1- 3- 5- 2- 6- 8-10- 4- 7- 9	81	2- 5- 8- 6- 3- 9-10- 1- 4- 7

82	3- 1- 9- 2- 4- 5- 6- 8- 7-10	82	5- 4- 7- 2- 1- 6- 9-10- 3- 8
83	8- 5- 2- 3- 1- 9-10- 4- 6- 7	83	1- 2- 8- 9- 7- 4- 5- 3- 6-10
84	5- 6- 8- 1- 4- 7- 9- 2- 3-10	84	1- 2- 5- 3- 6- 4- 9- 8- 7-10
85	4- 5- 3- 2- 1- 6- 8- 9- 7-10	85	2- 1- 8- 3- 4- 6- 7- 9- 5-10
86	7- 4- 6- 5- 3- 2- 1- 8- 9-10	86	2- 3- 9- 1- 6- 8- 7- 5- 4-10
87	8- 6- 5- 4- 2- 3- 1- 7- 9-10	87	2- 1- 3- 4- 5- 4- 7-10- 8- 9
88	5- 7- 9- 3- 1- 6- 2- 4- 8-10	88	2- 1- 6- 3- 7- 8- 9- 4- 5-10
89	2- 3- 5- 1- 7- 6- 9- 8- 4-10	89	2- 1- 7- 3- 4- 5- 8- 9- 6-10
90	1- 4- 6- 5- 2- 3- 8- 7- 9-10	90	2- 3- 7- 1- 4- 5- 8- 9- 6-10
91	2- 1- 6- 4- 5- 3- 7- 9- 8-10	91	5- 3- 1- 2-10- 9- 8- 4- 6- 7
92	5- 4- 7- 3- 1- 2- 9-10- 6- 8	92	5- 3- 1- 2- 8- 7-10- 4- 6- 9
93	2- 1- 4- 3-10- 5- 1- 9- 8- 6	93	3- 9- 1- 2- 4- 7- 6- 5- 8-10
94	6- 1- 3- 2- 8- 7- 9- 5- 4-10	94	7- 5- 3- 2- 1- 9-10- 4- 6- 8
95	3- 4- 7- 2- 1- 9- 8- 5- 6-10	95	4- 5- 9- 2- 8- 7- 6- 1- 3-10
96	4- 1- 3- 2- 7- 8-10- 9- 5- 6	96	6- 5- 7- 3- 1- 8- 9- 2- 4-10
97	5- 3- 6- 2- 8- 7-10- 9- 1- 4	97	3- 2- 6- 1- 8- 7- 9- 5- 4-10
98	1- 2- 7- 3- 8- 4- 9- 5- 6-10	98	1- 6- 7- 5- 2- 3-10- 9- 4- 8
99	4- 2- 9- 1- 6- 7- 8- 5- 3-10	99	1- 4- 5- 2- 6- 3- 8- 7- 9-10
100	4- 1- 8- 2-10- 5- 9- 6- 3- 7	100	6- 5- 4- 3- 2- 1- 9-10- 7- 8
101	4- 5- 7- 6- 1- 3- 2- 8- 9-10	101	7- 1- 5- 2- 8- 6- 9- 3- 4-10
102	4- 5- 7- 6- 1- 3- 2- 8- 9- 10	102	4- 1- 6- 3- 8- 7- 9- 2- 5-10
103	4- 5- 7- 8- 1- 3- 2-10- 6- 9	103	3- 4- 7- 2- 1- 9- 8- 5- 6-10
104	4- 3- 2- 6- 1- 5- 7- 8- 9-10	104	4- 1- 5- 2- 9- 8-10- 3- 6- 7
105	4- 5- 8- 7- 2- 1- 6- 9- 3-10	105	6- 3- 8- 1-10- 5- 9- 4- 2- 7
106	7- 6- 5- 3- 2- 1- 4-10- 9- 8	106	1- 2- 7- 3- 9- 4- 8- 6- 5-10
107	4- 5- 7- 6- 1- 3- 2- 9- 8-10	107	5- 4- 9- 1- 6- 7- 8- 2- 3-10
108	5- 4- 7- 8- 1- 3- 2-10- 6- 9	108	2- 3- 9- 4-10- 1- 8- 6- 5- 7
109	7- 6- 5- 3- 1- 2- 4-10- 9- 8	109	3- 5- 8- 6- 1- 4- 2- 9- 7-10
110	2- 1- 9- 4- 6- 5- 7-10- 3- 8	110	3- 5- 8- 6- 1- 4- 2- 9- 7-10
111	1- 2- 5- 8- 3- 4- 6-11- 7- 9	111	3- 5- 8- 6- 1- 4- 2- 7-10- 9
112	2- 3- 7- 1- 4- 5- 6- 9- 8-10	112	5- 9- 8- 4- 2- 6- 1- 3- 7-10
113	7- 8- 5- 3- 1- 6- 2-10- 4- 9	113	4- 5- 7- 6- 2- 1- 3- 9- 8-10
114	4- 5- 9- 1- 8-10- 6- 2- 3- 7	114	6- 7- 5- 4- 1- 2- 3- 8-10- 9
	.....	115	3- 5- 8- 6- 1- 4- 2- 7-10- 9
	.....	116	3- 5- 8- 6- 1- 4- 2- 8- 9-10
	.....	117	6- 7- 5- 4- 1- 2- 3- 8-10- 9
	.....	118	2- 1- 9- 3- 8- 5- 7- 6- 4-10
	.....	119	1- 2- 3- 8- 4- 5- 6- 9- 7-10
	.....	120	4- 9- 2- 1- 6- 5- 7- 3- 8-10
	.....	121	8- 6- 9- 3- 1- 7- 2- 5- 4-10
	.....	122	2- 5- 9- 1- 8-10- 6- 4- 3- 7
	.....	123	2- 1- 4- 3- 6- 7- 8- 9- 5-10
	.....	124	2- 1- 6- 3- 7- 8-10- 4- 5- 9

TABLE A (Continued)
 INDIVIDUAL PLACEMENT OF REQUISITES
 By 293 INDIVIDUALS
 (As Assigned by State and Federal Supervisors)

Vocational Shop Teacher										Related Subjects Teacher									
1	7-	3-10-	1-	6-	5-	4-	2-	8-	9	1	7-	1-10-	2-	4-	5-	6-	3-	8-	9
2	3-	5-	8-	1-	9-	2-	6-	4-	7-10	2	3-	7-	4-	1-	9-	2-	5-	6-	8-10
3	4-	5-	9-	2-	1-	8-10-	3-	6-	7	3	8-	3-	9-	2-	1-	6-	4-10-	5-	7
4	4-	5-	6-	7-	1-	2-	3-	8-	9-10	4	4-	5-	6-	7-	1-	2-	3-	8-	9-10
5	4-	3-	9-	2-	6-	5-	7-	1-	8-10	5	7-	5-	8-	4-	1-	3-	2-	6-10-	9
6	5-	3-	8-	1-	9-	6-	7-	2-	4-10	6	5-	2-	1-	3-	8-	4-	7-	6-	9-10
7	9-	8-	7-	2-	3-	4-	5-	1-10-	6	7	5-	3-	8-	1-	7-	4-	6-	9-	2-10
8	1-	4-	7-	3-	8-	2-	9-	5-	6-10	8	3-	4-	1-	2-	5-	6-	7-10-	9-	8
9	4-	3-10-	1-	6-	3-	9-	2-	8-	7	9	1-	4-	6-	3-	8-	2-	9-	5-	7-10
10	8-	7-	6-	1-	2-	5-10-	3-	4-	9	10	5-	3-	4-	1-	6-	8-	9-	2-	7-10
11	6-	5-	9-	2-	1-	7-	8-	3-	4-10	11	6-	7-	2-	3-	4-	8-10-	1-	5-	9
12	3-	4-10-	1-	5-	7-	9-	2-	6-	8	12	7-	3-	4-	2-	1-	9-10-	8-	6-	5
13	3-	7-	8-	1-	6-	5-	4-	2-	8-10	13	3-	4-	7-	1-	8-	5-10-	2-	6-	9
14	2-	5-	6-	3-	1-	7-	9-	4-	8-10	14	3-	8-	4-	1-	5-	6-	7-	2-	9-10
15	4-	6-10-	1-	5-	7-	9-	2-	3-	8	15	2-	6-	7-	3-	1-	8-	9-	5-	4-10
16	5-	4-	3-	1-	2-	7-	6-	8-	9-10	16	4-	5-	2-	1-	6-	7-	8-10-	3-	9
17	5-	3-	6-	1-	7-	8-10-	2-	4-	9	17	5-	4-	3-	1-	2-	6-	7-	8-	9-10
18	5-	4-	9-	1-	3-	8-	7-	2-	6-10	18	6-	3-	5-	1-	7-	8-10-	2-	4-	9
19	5-	7-10-	2-	1-	4-	6-	3-	9-	4	19	4-	3-	5-	1-	2-	8-	9-	6-	7-10
20	8-	2-	4-	5-	9-	1-10-	3-	7-	6	20	5-	7-10-	2-	1-	3-	6-	8-	9-	4
21	6-	5-	7-	1-	9-	4-10-	2-	3-	8	21	8-	2-	3-	5-	9-	1-10-	4-	7-	6
22	4-	9-	5-	6-	1-	2-	3-	7-	8-10	22	5-	4-	2-	1-	9-	3-10-	8-	6-	7
23	3-	6-	8-	1-	9-	5-	4-	2-	7-10	23	1-	5-	8-	2-	9-	4-	6-	3-	4-10
24	8-	7-	9-	5-	3-	2-	1-	4-	6-10	24	8-	7-	9-	5-	3-	2-	1-	4-	6-10
25	9-	4-	6-	2-	5-	7-	8-	1-	3-10	25	6-	5-	7-	1-	4-	8-	9-	2-	3-10
26	3-	8-	7-	2-	5-	4-	9-	1-	6-10	26	1-	6-	3-	2-	5-	4-	9-	7-	8-10
27	6-	7-10-	1-	8-	4-	5-	2-	3-	9	27	6-	7-10-	1-	8-	3-	5-	4-	2-	9
28	6-	4-10-	1-	5-	7-	8-	3-	2-	9	28	4-	3-	7-	1-	5-	6-	8-10-	3-	9
29	4-	6-10-	2-	1-	5-	9-	3-	7-	8	29	2-	6-	3-	4-	1-	7-	8-	5-	9-10
30	2-	5-10-	1-	7-	6-	9-	3-	4-	8	30	1-	4-	8-	3-	5-	6-	7-	9-	2-10
31	4-	5-	8-	1-	9-	7-	6-	2-	3-10	31	4-	7-	5-	1-	9-	6-	8-	2-	3-10
32	6-	4-	8-	2-	1-	5-	7-	3-	9-10	32	4-	3-	7-	2-	1-	5-	8-	6-	9-10
33	4-	3-	6-	2-	7-	8-	9-	1-	5-10	33	2-	4-	5-	1-	7-	3-	6-	8-	9-10

(As Assigned by City Supervisors of Industrial and Vocational Education, Cities of 50,000 population)

1	5- 2- 6- 1- 7- 4- 8- 3- 9-10	1	3- 6- 5- 1- 7- 2- 8- 9- 4-10
2	2- 5- 8- 3- 7- 1- 9- 4- 6-10	2	5- 6- 2- 1- 4- 3- 7- 8- 9-10
3	4- 2- 8- 1- 5- 3- 6- 9- 7-10	3	5- 6- 4- 7- 2- 1-10- 8- 3- 9
4	8- 6- 7- 1- 3- 4- 5- 2- 9-10	4	7- 4- 5- 1- 2- 8- 9- 3- 6-10
5	6- 3- 9- 1- 7- 5- 8- 2- 4-10	5	2- 3- 5- 1- 8- 9-10- 4- 6- 7
6	4- 5-10- 1- 7- 6- 9- 2- 3- 8	6	6- 8- 4- 5- 1- 3- 2- 7- 9-10
7	3- 4- 9- 1- 8- 5- 6- 2- 7-10	7	5- 6- 8- 2- 3- 1- 9- 4- 7-10
8	2- 6- 7- 4- 9- 1-10- 3- 8- 5	8	2- 1- 5- 3- 9- 6- 8- 4- 7-10
9	2- 5- 7- 1- 6- 8- 9- 4- 3-10	9	8- 6- 4- 5- 1- 2- 3- 7- 9-10
10	4- 5- 7- 3- 8- 6- 9- 1- 2-10	10	8- 6- 2- 4- 1- 3- 7- 9- 5-10
11	4- 5- 3- 6- 2- 1- 7-10- 9- 8	11	5- 2- 6- 1- 9- 8-10- 7- 4- 3
12	6- 5- 2- 3- 1- 4- 7-10- 8- 9	12	3- 2- 6- 5- 1- 4- 8-10- 9- 7
13	7- 9-10- 5- 1- 2- 3- 6- 8- 4	13	4- 5- 2- 1- 7- 8- 9- 3- 6-10
14	6- 8-10- 4- 1- 2- 3- 5- 7- 9	14	4- 7- 3- 2- 8- 1- 9- 6- 5-10
15	2- 1- 9- 3- 4- 8- 6- 5-10- 7	15	1- 8- 3- 2- 4- 7- 6-10- 5- 8
16	5- 3- 7- 2- 9- 8- 6- 1- 4-10	16	3- 4- 5- 6- 7- 2- 8- 1- 9-10
17	3- 4- 7- 1- 5- 8- 8- 2- 9-10	17	2- 7- 6- 3- 8- 1- 9- 4- 5-10
18	8- 6-10- 4- 2- 1- 3- 5- 7- 9	18	4- 2- 8- 1- 5- 3- 6- 9- 7-10
19	4- 3- 9- 2- 8- 5- 7- 1- 6-10	19	4- 3- 1- 2- 5- 6- 7-10- 8- 9
20	1- 3- 7- 2- 5- 4- 8- 6- 9-10	20	1- 5- 3- 2- 6- 7- 8- 4- 9-10
21	5- 2-10- 1- 6- 7- 8- 3- 4- 9	21	2- 1- 9- 7- 5- 4-10- 6- 3- 8
22	6- 2-10- 4- 7- 5- 8- 1- 3- 9	22	3- 4- 1- 5- 8- 6- 7- 2- 9-10
23	6- 2-10- 1- 5- 7- 8- 3- 4- 9	23	2- 6- 7- 4- 9- 1-10- 3- 8- 5
24	10- 2- 7- 1- 9- 6- 8- 3- 4- 5	24	3- 4- 6- 1- 7- 5- 9- 8- 2-10
25	7- 4-10- 6- 1- 8- 5- 3- 9- 2	25	2- 4- 5- 1- 6- 7- 8- 9- 3-10
26	5- 6-10- 2- 1- 4- 8- 3- 7- 9	26	4- 5- 3- 6- 2- 1- 7-10- 9- 8
27	4- 2- 7- 1- 9- 6-10- 3- 5- 8	27	6- 5- 2- 3- 1- 4- 7-10- 8- 9
28	6- 3- 8- 2- 1-10- 9- 4- 5- 7	28	10- 7- 5- 6- 1- 2- 3- 8- 9- 4
29	1- 4- 9- 2-10- 5- 6- 3- 7- 8	29	7- 4- 5- 6- 1- 2- 3-10- 9- 8
30	6- 5- 4- 1- 3- 2- 9-10- 7- 8	30	1- 8- 3- 2- 4- 7- 6-10- 5- 8
31	7- 2- 6- 1- 5- 9- 8- 3- 4-10	31	8- 5- 2- 1-10- 9- 7- 6- 3- 4
32	5- 6- 7- 1- 2- 3- 4- 8- 9-10	32	6- 5- 9- 1- 7- 8-10- 4- 3- 2
33	3- 6- 8- 2- 7- 5- 9- 1- 4-10	33	7- 6- 4- 8- 2- 1- 3- 5- 9-10
34	3- 6- 8- 1- 9- 4- 7- 2- 5-10	34	3- 4- 9- 1- 8- 5- 7- 2- 6-10
35	7- 2- 5- 1- 4- 9- 6-10- 3- 8	35	1- 8- 2- 5- 6- 3- 7- 4- 9-10
36	2- 7- 8- 6- 1- 3- 4- 5- 9-10	36	3- 2-10- 1- 6- 7- 8- 4- 5- 9
37	6- 4- 8- 2- 5- 1-10- 3- 7- 9	37	4- 1-10- 3- 9- 5- 8- 2- 6- 7
38	3- 4- 9- 2- 6- 1- 7- 5- 8-10	38	8- 7- 2- 1- 3- 4- 5- 9- 6-10
39	5- 3- 8- 1- 9- 7-10- 2- 4- 6	39	10- 3- 1- 4- 9- 6- 7- 2- 8- 5
40	6- 5- 7- 4- 1- 2- 9- 3- 8-10	40	7- 8- 4- 5- 1- 9- 6- 3-10- 2
41	5- 4- 9- 6- 1- 2- 3- 7- 8-10	41	5- 7- 2- 3- 1- 4-10- 6- 9- 8
42	7- 4- 9- 2- 1- 6- 8- 3- 5-10	42	1- 5- 7- 4- 9- 3-10- 6- 2- 8
43	10- 4- 8- 2- 1- 3- 9- 7- 6- 5	43	2- 5- 7- 3- 1-10- 9- 4- 6- 8
44	6- 7- 8- 4- 1- 3- 2- 5- 9-10	44	1- 2- 3- 6-10- 4- 5- 9- 7- 8
45	7- 8- 9- 1- 2- 3- 4- 5- 6-10	45	8- 7- 6- 1- 4- 3- 9-10- 2- 5
46	5- 2- 7- 3- 1- 8- 6- 4- 9-10	46	9- 2- 4- 1- 5- 8- 7- 6- 3-10
47	6- 4- 7- 1- 4- 3-10- 2- 5- 9	47	5- 6- 7- 1- 2- 3- 4- 8- 9-10
48	5- 6- 9- 3- 1- 2- 8- 4- 7-10	48	3- 6- 1- 4- 8- 2- 9- 7- 5-10
49	7- 3-10- 1- 6- 5- 8- 2- 4- 9	49	4- 7- 2- 1- 9- 5- 8- 6- 3-10
50	5- 6- 7- 1- 3- 4- 8- 2- 9-10	50	7- 2- 5- 1- 4- 9- 6-10- 8

51	4- 3-10- 1- 6- 7- 9- 2- 5- 8	51	2- 8- 5- 6- 1- 3- 4- 7- 9-10
52	2- 7- 6- 3- 9- 5-10- 1- 4- 8	52	7- 4- 6- 3- 9- 1-10- 2- 5- 8
53	7- 4- 6- 2- 1- 8- 9- 3- 5-10	53	5- 3- 4- 2- 6- 1- 7-10- 8- 9
54	4- 3- 8- 1- 6- 7- 5- 2- 9-10	54	5- 2- 4- 1- 9- 7-10- 3- 6- 8
55	3- 6- 8- 1- 7- 5- 9- 2- 4-10	55	5- 4- 8- 7- 1- 2- 3- 6- 9-10
56	3- 8- 9- 2- 4- 7- 5- 1- 6-10	56	8- 7- 4- 2- 1- 6- 9- 5- 3-10
57	5- 6-10- 1- 3- 2- 8- 4- 7- 9	57	10- 4- 8- 2- 1- 3- 9- 7- 6- 5
58	6- 4- 7- 1- 3- 8- 9- 2- 5-10	58	7- 8- 6- 4- 1- 3- 2- 5- 9-10
59	2- 3- 4- 1- 8- 5- 9- 6- 7-10	59	7- 6- 5- 1- 2- 3- 4- 9- 8-10
60	6- 8- 7- 5- 1- 3- 2- 4- 9-10	60	4- 2- 5- 3- 1- 8- 6- 7- 9-10
61	5- 6- 9- 2- 4- 1- 8- 3- 7-10	61	1- 5- 4- 2- 9- 6-10- 3- 8- 7
62	3- 4-10- 1- 9- 5- 6- 2- 7- 8	62	5- 6- 7- 4- 1- 2- 8- 3- 9-10
63	7- 6- 8- 5- 1- 2- 3- 4- 9-10	63	9- 8- 5- 1- 7- 6-10- 2- 3- 4
64	8- 7- 9- 2- 1- 3- 6- 4- 5-10	64	6- 7- 2- 1- 4- 5- 8- 3- 9-10
65	6- 1- 7- 3- 9- 8-10- 2- 4- 5	65	2- 1-10- 4- 6- 7- 9- 5- 3- 8
66	3- 2- 6- 5- 1- 4- 9- 7-10- 8	66	3- 7- 6- 2- 9- 5-10- 4- 1- 8
67	3- 4- 6- 1- 7- 8- 9- 2- 5-10	67	4- 2- 5- 3- 1- 7- 8-10- 6- 9
68	6- 5- 7- 3- 8- 1- 9- 2- 4-10	68	6- 4- 8- 1- 2- 7- 3- 5- 9-10
69	6- 4- 8- 1- 2- 7- 3- 5- 9-10	69	7- 8- 5- 6- 1- 3- 4-10- 9- 2
70	6- 9- 8- 7- 1- 3- 5- 4-10- 2	70	10- 6- 4- 2- 1- 5- 9- 3- 7- 8
71	10- 6- 4- 2- 1- 5- 9- 3- 7- 8	71	6- 1- 7- 2- 9- 5- 8- 3- 4-10
72	6- 1- 7- 2- 9- 5- 8- 3- 4-10	72	5- 6- 2- 3- 1- 8- 9-10- 4- 7
73	6- 5- 4- 2- 1- 7- 8- 3-10- 9	73	5- 6- 7- 4- 1- 2- 3- 9- 8-10
74	7- 6- 8- 9- 1- 2- 3- 4- 5-10	74	5- 4- 7- 1- 8- 2-10- 3- 6- 9
75	5- 4- 6- 1- 8- 3- 9- 2- 7-10		.....

(As assigned by Heads of Industrial and Vocational Teacher-Training Departments and Institutions)

1	6- 4- 9- 1- 3- 7- 2- 5- 8-10	1	7- 4- 5- 1- 3- 6- 2- 9- 8-10
2	6- 3-10- 1- 4- 5- 7- 2- 8- 9	2	1- 3- 7- 2- 4- 5- 6- 8- 9-10
3	8- 4- 9- 1-10- 5- 6- 2- 3- 7	3	4- 9- 8- 1-10- 5- 6- 2- 3- 7
4	6- 3- 8- 1-10- 4- 7- 2- 5- 9	4	3- 2- 8- 5- 4- 1- 9-10- 6- 7
5	4- 6- 7- 3-10- 5- 9- 1- 2- 8	5	4- 5- 9- 1- 6- 3- 7- 8- 2-10
6	5- 6-10- 1- 7- 4- 8- 2- 3- 9	6	4- 5- 9- 1- 6- 3- 7- 8- 2-10
7	6- 4-10- 2- 7- 5- 8- 1- 3- 9	7	5- 6- 7- 1- 8- 4- 9- 3- 2-10
8	7- 6- 9- 4- 1- 2- 3- 5- 8-10	8	8- 9- 5- 4- 1- 2- 3-10- 6- 7
9	7- 6-10- 1- 3- 5- 8- 4- 2- 9	9	6- 5- 7- 1- 8- 3-10- 4- 2- 9
10	6- 3- 8- 1- 7- 5-10- 2- 4- 9	10	5- 2- 8- 1- 7- 4-10- 6- 3- 9
11	6- 7- 9- 3- 1- 5- 2- 4- 8-10	11	7- 8- 6- 3- 1- 2- 5- 4- 9-10
12	7- 2- 6- 1- 5- 8- 9- 4- 3-10	12	5- 2- 6- 1- 7- 8- 9- 4- 3-10
13	5- 6- 8- 2- 1- 7- 9- 3- 4-10	13	4- 5- 3- 2- 1- 6- 9- 8- 9-10
14	5- 6-10- 3- 2- 1- 9- 7- 4- 8	14	4- 6- 3- 5- 2- 1- 8- 7- 9-10
15	5- 3- 4- 1- 7- 6- 8- 2- 9-10	15	8- 7- 6- 1- 3- 2- 9- 4- 5-10
16	3- 5- 4- 1- 6- 7- 9- 2- 8-10	16	2- 8- 3- 1- 5- 7- 6- 4- 9-10
17	1- 6- 9- 2- 5- 7- 8- 3- 4-10	17	1- 8- 4- 2- 5- 6- 7- 9- 3-10
18	6- 8-10- 1- 3- 4- 5- 2- 7- 9	18	7- 8- 2- 4- 1- 5- 6- 3- 9-10
19	3- 4- 6- 1- 7- 5-10- 2- 8- 9	19	3- 7- 2- 1- 6- 5-10- 4- 8- 9
20	4- 5- 3- 1- 8- 9-10- 2- 6- 7	20	6- 5- 1- 2- 8- 9-10- 7- 3- 4
21	4- 3- 7- 2- 9- 8-10- 1- 5- 6	21	4- 5- 9- 1- 8- 7-10- 2- 3- 6
22	6- 4- 5- 2- 7- 8- 9- 1- 3-10	22	6- 5- 3- 1- 7- 8- 9- 2- 4-10
23	6- 8- 9- 1- 3- 4- 5- 2- 7-10	23	8- 9- 7- 1- 2- 3- 4- 5- 6-10
24	2- 3- 5- 1- 6- 4- 9- 7- 8-10	24	8- 7- 5- 4- 6- 1- 2- 3- 9-10
25	7- 8- 4- 2- 1- 9-10- 3- 5- 6	25	8- 7- 3- 2- 1- 9-10- 4- 5- 6

26	3- 4-10- 1- 8- 7- 6- 2- 5- 9	26	4- 3- 9- 1- 8- 7- 6- 2- 5-10
27	6- 3- 8- 4- 1- 2- 9- 5- 7-10	27	7- 3- 5- 4- 1- 2- 9- 6- 8-10
28	5- 4- 9- 1- 6- 7- 8- 2- 3-10	28	9- 8- 5- 1- 4- 7- 6- 2- 3-10
29	4- 6- 9- 1- 8- 5- 7- 2- 3-10	29	3- 6- 8- 1- 7- 4- 9- 5- 2-10
30	9- 4- 6- 1- 7- 5- 8- 2- 3-10	30	9- 6- 2- 1- 7- 5- 8- 3- 4-10
31	3- 4-10- 1- 8- 7- 6- 2- 5- 9	31	4- 3- 9- 1- 8- 7- 6- 2- 5-10
32	2- 4- 8- 1- 3- 5- 9- 6- 7-10	32	2- 4- 6- 1- 3- 7- 8- 9- 5-10
33	4- 1- 9- 5- 2- 7- 3- 6- 8-10	33	4- 1- 5- 7- 2- 6- 3- 9- 8-10
34	6- 5- 4- 1- 7- 8- 9- 2- 3-10	34	8- 3- 4- 1- 6- 7- 5- 2- 9-10
35	7- 4- 8- 1- 5- 6- 9- 2- 3-10	35	7- 4- 5- 1- 6- 8- 9- 2- 3-10
36	8- 6- 7- 3- 1- 2- 5- 4-10- 9	36	7- 8- 6- 1- 4- 3- 5- 2- 9-10
37	6- 5- 8- 3- 1- 2- 9- 7- 4-10	37	7- 5- 6- 3- 1- 2- 4- 9- 8-10
38	5- 4-10- 1- 7- 6- 9- 3- 2- 8	38	4- 3- 9- 1- 7- 6-10- 5- 2- 8
39	6- 3- 9- 1- 2- 5- 8- 4- 7-10	39	7- 3- 4- 1- 2- 6- 8- 5- 9-10
40	6- 4- 8- 2- 5- 7- 9- 1- 3-10	40	3- 6- 4- 1- 7- 8- 9- 5- 2-10
41	9- 6- 5- 2- 8- 7-10- 1- 3- 4	41	8- 6- 1- 2- 5- 9-10- 6- 4- 3
42	4- 1- 6- 2- 8- 3- 9- 5- 7-10	42	3- 6- 7- 4- 1- 2- 8- 9- 5-10
43	5- 6- 9- 7- 3- 1- 2- 4- 8-10	43	4- 1- 5- 2- 8- 3- 7- 9- 6-10
44	7- 9- 8- 2- 1- 4-10- 3- 5- 6	44	4- 6- 5- 7- 3- 1- 2- 9- 8-10
45	5- 4- 3- 2- 7- 8- 9- 1- 6-10	45	10- 8- 4- 3- 1- 7- 9- 5- 6- 2
46	1- 4- 8- 5- 2- 9- 7- 6- 3-10	46	4- 3- 1- 2- 7- 8- 9- 6- 5-10
47	6- 4- 9- 2- 1- 8- 7- 3- 5-10	47	1- 4- 6- 5- 2- 7- 8- 9- 3-10
48	3- 4-10- 2- 1- 7- 8- 5- 9- 6	48	5- 4- 3- 2- 1- 8- 9- 6- 7-10
49	4- 5- 9- 1-10- 2- 7- 3- 6- 8	49	3- 2- 4- 5- 1- 6- 7-10- 8- 9
50	3- 7- 6- 1- 4- 5- 9- 2- 8-10	50	9- 7- 6- 1- 5- 2- 9- 3- 4-10
51	6- 7- 9- 3- 1- 8- 2- 4- 5-10	51	2- 8- 3- 1- 5- 7- 9- 4- 6-10
52	1- 5- 7- 3- 8- 2-10- 4- 6- 9	52	6- 7- 5- 3- 1- 9- 2- 4- 8-10
53	9- 7- 8- 3- 1- 6-10- 4- 5- 2	53	1- 3- 6- 4- 8- 9-10- 7- 5- 9
54	5- 4- 9- 2- 7- 6- 8- 1- 3-10	54	9- 8- 5- 3- 1- 6-10- 7- 4- 2

(AsAssigned by Teachers in Service and Teachers in Training. Random Sampling throughout the Country)

1	7- 3-10- 2- 1- 8- 4- 5- 6- 9	1	5- 3- 7- 2- 1- 6- 4-10- 8- 9
2	5- 4- 9- 1- 6-10- 8- 2- 3- 7	2	7- 5- 6- 2- 8- 4-10- 1- 3- 9
3	4- 9-10- 1- 6- 5- 7- 2- 3- 8	3	7- 8- 4- 6- 1- 3- 2- 9- 5-10
4	7- 5-10- 4- 1- 6- 2- 3- 9- 8	4	6-10- 5- 2- 1- 3- 8- 4- 7- 9
5	5- 8- 7- 3- 1- 4-10- 2- 6- 9	5	10- 9- 8- 5- 1- 4- 2- 7- 6- 3
6	10- 9- 8- 5- 1- 4- 2- 7- 6- 3	6	6- 7- 4- 2- 1- 5-10- 9- 3- 8
7	4- 5- 6- 1- 8- 9-10- 2- 3- 7	7	5- 2- 4- 1- 9- 7-10- 3- 6- 8
8	4- 3- 8- 1- 9- 7-10- 2- 5- 6	8	9- 3- 7- 2- 6- 1- 4- 5- 8-10
9	9- 5- 8- 3- 7- 1- 6- 2- 4-10	9	4- 3- 5- 1- 8- 9-10- 2- 6- 7
10	6- 3- 5- 2- 9-10- 8- 1- 4- 7	10	5- 2- 4- 1- 9- 7-10- 3- 6- 8
11	9- 5- 8- 2- 7- 1- 6- 3- 4-10	11	6- 5- 7- 2- 9- 1- 8- 4- 3-10
12	4- 3- 8- 1- 9- 7-10- 2- 5- 6	12	5- 4- 1- 3- 8- 6- 7- 9- 2-10
13	4- 5- 7- 1- 9- 2-10- 3- 6- 8	13	2- 1- 5- 3- 8- 9-10- 4- 6- 7
14	2- 7- 8- 1- 6- 9-10- 3- 4- 5	14	5- 2- 4- 1- 9- 7-10- 3- 6- 8
15	4- 3- 9- 1- 6- 5- 7- 2- 8-10	15	3- 4- 6- 1- 8- 5- 9- 7- 2-10
16	4- 3- 9- 1- 6- 5- 7- 2- 8-10	16	2- 5- 6- 1- 8- 4- 9- 7- 3-10
17	5- 2- 9- 1- 6- 4- 8- 3- 7-10	17	2- 5- 6- 1- 8- 4- 9- 7- 3-10
18	4- 3- 8- 1- 9- 7-10- 2- 5- 6	18	5- 2- 4- 1- 9- 7-10- 3- 6- 8
19	4- 3- 9- 1- 6- 5- 7- 2- 8-10	19	3- 4- 6- 1- 8- 5- 9- 7- 2-10
20	3- 4- 9- 1- 6- 5- 7- 2- 8-10	20	2- 5- 6- 1- 8- 4- 9- 7- 3-10
21	7- 3- 8- 4- 5- 1- 6- 2- 9-10	21	3- 4- 5- 1- 8- 7- 9- 6- 2-10

22	4-3-9-1-10-8-7-5-2-6	22	2-3-4-1-6-5-9-8-7-10
23	5-2-9-1-6-4-8-3-7-10	23	5-2-4-1-9-7-10-3-6-8
24	4-5-6-1-8-7-10-3-2-9	24	3-4-6-1-8-5-9-7-2-10
25	4-2-3-1-8-6-9-5-7-10	25	2-5-6-1-8-4-9-7-3-10
26	4-3-8-1-9-7-10-2-5-6	26	5-4-1-3-8-7-6-9-2-10
27	3-1-7-2-6-4-5-8-9-10	27	5-6-4-1-8-7-9-2-3-10
28	5-2-9-1-6-4-8-3-7-10	28	5-2-4-1-9-7-10-3-6-8
29	5-3-4-2-8-7-9-1-6-10	29	2-5-6-1-8-4-9-7-3-10
30	5-3-9-1-7-8-6-2-4-10	30	2-3-10-1-7-6-8-4-5-9
31	5-6-9-1-2-4-7-3-8-10	31	4-1-2-3-8-7-9-6-5-10
32	5-2-9-1-6-4-8-3-7-10	32	5-2-4-1-9-7-10-3-6-8
33	7-6-9-1-2-3-4-5-8-10	33	3-1-5-2-4-7-8-6-10-9
34	4-6-8-1-9-5-7-9-8-10	34	5-4-3-1-8-7-9-2-6-10
35	5-4-8-2-1-6-9-3-7-10	35	6-4-5-1-7-9-8-3-2-10
36	5-2-9-1-6-4-8-3-7-10	36	5-2-4-1-9-7-10-3-6-8
37	5-4-7-2-1-6-8-3-10-9	37	6-5-9-1-2-3-4-8-7-10
38	8-3-6-2-1-7-5-4-10-9	38	2-8-4-1-9-6-10-3-7-5
39	4-3-9-1-10-8-7-2-5-6	39	2-5-7-1-6-3-4-8-9-10
40	4-3-8-1-9-7-10-2-5-6	40	5-2-4-1-9-7-10-3-6-8
41	4-1-9-2-5-3-6-8-7-10	41	5-3-4-2-1-7-9-6-8-10
42	7-2-5-1-6-8-9-3-4-10	42	4-3-8-2-1-6-7-5-9-10
43	2-5-6-1-8-9-10-3-4-7	43	8-3-6-2-1-7-5-4-10-9
44	4-5-9-1-8-8-6-2-3-10	44	1-2-9-4-10-8-7-3-5-6
45	7-3-4-2-1-7-8-6-5-10	45	5-2-4-1-9-7-10-3-6-8
46	6-3-9-7-2-8-1-4-5-10	46	5-4-10-2-6-1-3-7-8-9
47	4-3-8-1-9-7-10-2-5-6	47	3-5-6-1-8-9-10-2-4-7
48	8-5-7-4-3-2-1-6-9-10	48	6-7-3-2-8-5-9-1-4-10
49	4-3-8-6-2-5-1-7-9-10	49	6-5-2-3-1-7-9-10-4-8
50	6-5-8-4-2-3-1-7-9-10	50	5-2-4-1-9-7-10-3-6-8
51	5-8-9-3-1-6-4-2-7-10	51	4-5-2-1-8-7-9-6-3-10
52	5-4-9-2-8-7-6-1-3-10	52	1-7-6-5-2-3-10-9-4-8
53	4-3-8-1-9-7-10-2-5-6	53	6-3-2-5-7-1-8-9-4-10
54	5-7-8-6-2-1-10-3-4-9	54	7-6-4-3-2-1-8-9-5-10
55	2-6-7-1-8-3-9-4-5-10	55	5-2-4-1-9-7-10-3-6-8
56	8-6-9-2-1-5-7-3-4-10	56	3-2-1-4-9-5-8-10-7-6
57	4-3-8-1-9-7-10-2-5-6	57	6-3-1-2-8-5-9-7-4-10
58	2-6-10-3-8-7-9-4-2-5	58	8-6-7-3-1-2-10-5-4-9
59	5-3-6-4-8-9-10-1-2-7	59	3-2-1-6-7-9-8-10-4-5
60	7-6-5-1-9-8-10-2-4-3	60	5-2-4-1-9-7-10-3-6-8
61	4-2-6-1-8-3-7-5-9-10	61	4-2-5-1-8-9-10-6-3-7
62	4-3-8-1-9-7-10-2-5-6	62	2-3-1-5-10-7-8-6-4-9
63	4-1-8-3-9-10-5-2-6-7	63	4-2-6-1-8-3-7-5-9-10
64	6-2-5-1-7-9-10-3-4-8	64	4-1-7-2-9-6-10-3-8-5
65	6-2-1-3-10-4-7-8-5-9	65	6-3-1-2-7-9-10-4-5-8
66	3-6-7-10-5-6-4-9-2-8	66	6-2-1-3-10-4-7-8-5-9
67	4-3-8-1-9-7-10-2-5-6	67	5-2-4-1-9-7-10-3-6-8
68	4-2-7-1-9-3-10-5-8-6	68	10-8-7-4-5-6-2-3-1-9
69	4-3-6-1-10-8-9-2-5-7	69	2-3-1-4-9-10-8-7-6-5
70	10-8-9-2-7-4-5-1-3-6	70	3-4-6-2-8-7-9-10-5-1
71	3-1-5-4-6-7-8-2-9-10	71	5-6-1-2-10-3-7-9-8-4
72	6-3-9-1-5-4-10-2-8-7	72	4-2-6-1-5-7-8-3-9-10
73	4-3-8-1-9-7-10-2-5-6	73	5-2-9-1-6-4-10-3-7-8
74	2-1-5-3-8-6-7-4-9-10	74	2-1-3-4-10-6-7-8-5-9
75	2-1-9-3-6-5-7-4-8-10	75	2-1-4-3-6-7-8-10-5-9

76 1- 8-10- 2- 5- 9- 7- 4- 3- 6
77 3- 2- 9- 1- 5- 4- 7- 6- 8-10
78 4- 3- 8- 1- 9- 7-10- 2- 5- 6
79 9-10- 5- 3- 6- 8- 7- 2- 4- 1
80 4- 2- 8- 1- 5- 3- 9- 6- 7-10
81 5- 3- 6- 4- 8- 9-10- 1- 2- 7
82 6- 5- 7- 1- 3- 2- 4-10- 8- 9
83 4- 3- 8- 1- 9- 7-10- 2- 5- 6
84 1- 2- 8- 3- 5- 6- 7- 4- 9-10
85 1- 6-10- 2- 8- 7- 9- 3- 4- 5
86 1- 6-10- 2- 8- 7- 9- 3- 4- 5
87 4- 3- 5- 1- 6- 7-10- 2- 8- 9
88 4- 6- 7- 8- 3- 9-10- 2- 5- 1
89 4- 3- 8- 1- 9- 7-10- 2- 5- 6
90 1- 6-10- 2- 8- 7- 9- 3- 4- 5
91 6- 5- 7- 2- 1- 9-10- 3- 4- 8
92 1- 2-10- 3- 8- 7- 9- 4- 5- 6
93 1- 3-10- 2- 6- 4- 9- 5- 8- 7
94 1- 3-10- 4- 5- 6- 9- 2- 7- 8
95 3- 2- 9- 1- 6- 8- 7- 5- 4-10
96 1- 2- 7- 3- 8- 4- 9- 5- 6-10
97 3- 5- 6- 1- 7- 8- 9- 2- 4-10
98 5- 1- 8- 2- 3- 4- 9- 7- 6-10
99 5- 3- 6- 1- 4- 8- 7-10- 2- 9
100 1- 2- 7- 3- 6- 9-10- 4- 8- 5
101 1- 2- 6- 4- 7- 8-10- 3- 5- 9
102 3- 1- 8- 2- 4- 7- 6- 5- 9-10
103 7- 6- 5- 2- 1- 9-10- 3- 4- 8
104 7- 5- 8- 3- 1- 2-10- 4- 6- 9
105 4- 3- 5- 2- 7- 5- 9- 1- 6-10
106 6- 2- 9- 4- 7- 5- 8- 1- 3-10
107 3- 5- 7- 2- 1- 9- 8- 4- 6-10
108 6- 4- 8- 1- 5- 9-10- 2- 3- 7
109 6- 4- 8- 3-10- 5- 9- 1- 2- 7
110 1- 2- 7- 3- 9- 8- 8- 4- 5-10
111 5- 4- 9- 1- 6- 7- 8- 2- 3-10
112 1- 2- 7- 3- 8- 4- 9- 5- 6-10
113 6- 5- 8- 4- 1- 3- 2- 7- 9-10
114 6- 5- 8- 4- 1- 3- 2- 7- 9-10
115 8- 6- 9- 4- 1- 3- 2- 5- 7-10
116 7- 8-10- 3- 1- 6- 2- 4- 5- 9
117 6- 5- 7- 4- 2- 1- 8- 3- 9-10
118 7- 6-10- 3- 2- 1- 4- 5- 8- 9
119 6- 7-10- 2- 1- 4- 5- 3- 8- 9
120 8- 6- 9- 5- 1- 3- 2- 4- 7-10
121 7- 6-10- 3- 2- 1- 4- 5- 8- 9
122 6- 4-10- 1- 8- 3- 7- 2- 5- 9
123 4- 3- 8- 1- 6- 5- 7- 2- 9-10
124 3- 8- 9- 1- 5- 4- 6- 2- 7-10
125 9- 6- 8- 3- 1- 7- 2- 4- 5-10
126 9- 4- 7- 1- 8-10- 6- 2- 3- 5
127 2- 1- 4- 3- 5- 7- 8- 9- 6-10
128 6- 3- 5- 1- 8- 9-10- 2- 4- 7
129 2- 1- 8- 3- 6- 5- 7- 9- 4-10
130 1- 2- 4- 5- 6- 8- 9-10- 3- 7

76 1-10- 5- 2- 3- 8- 7- 9- 4- 6
77 1- 4- 8- 3- 7- 2- 9- 5- 6-10
78 10- 3- 4- 9- 5- 8- 7- 2- 6- 1
79 4- 3- 1- 2- 9- 5-10- 6- 7- 8
80 3- 2- 1- 6- 8- 9-10- 7- 5- 4
81 5- 3- 7- 1- 4- 8- 6-10- 2- 9
82 1- 2- 4- 3- 5- 6- 7- 8- 9-10
83 5- 1- 6- 2- 8- 3- 9-10- 7- 4
84 4- 1- 7- 2- 6- 3- 9-10- 8- 5
85 5- 1- 7- 2- 6- 3- 9-10- 8- 4
86 4- 3- 2- 1- 6- 7- 8-10- 5- 9
87 3- 5- 2- 4- 1- 8-10- 9- 6- 7
88 4- 5- 3- 2- 1- 9- 8-10- 6- 7
89 1- 2- 3- 5- 7- 6-10- 4- 8- 9
90 1- 3- 7- 2- 6- 4- 9- 8- 5-10
91 1- 2- 9- 3- 4- 5- 9- 8- 6-10
92 2- 3- 9- 1- 6- 7- 5- 8- 4-10
93 2- 3- 1- 9- 7- 5- 8- 4- 6-10
94 5- 4- 6- 2- 7- 8- 9- 1- 3-10
95 2- 1- 6- 3- 4- 5- 8- 9- 7-10
96 3- 5- 6- 1- 4- 8- 7- 2- 9-10
97 1- 4- 2- 3- 7- 8- 9- 5- 6-10
98 1- 4- 2- 3- 7- 8- 9- 5- 6-10
99 3- 1- 5- 2- 4- 6- 7- 8- 9-10
100 7- 4- 3- 2- 1- 9-10- 5- 6- 8
101 3- 6- 4- 2- 1- 9- 8- 5- 7-10
102 6- 2- 8- 1- 7- 9-10- 5- 3- 4
103 6- 4- 8- 1-10- 5- 9- 2- 3- 7
104 1- 2- 4- 3- 9- 6- 8- 7- 5-10
105 4- 2- 6- 1- 8- 7- 9- 5- 3-10
106 2- 6- 5- 3- 9- 1- 8- 7- 4-10
107 8- 6- 5- 7- 1- 3- 2- 4- 9-10
108 8- 6- 5- 7- 1- 3- 2- 4- 9-10
109 8- 6- 7- 4- 1- 3- 2- 5- 9-10
110 7- 6- 3- 8- 1- 5- 2- 4-10- 9
111 3- 4- 8- 6- 2- 1- 5- 9- 7-10
112 6- 7- 4- 3- 2- 1- 5-10- 9- 8
113 7- 8- 9- 2- 1- 3- 5- 6- 9-10
114 8- 7- 6- 5- 1- 3- 2- 4- 9-10
115 6- 7- 4- 3- 2- 1- 5-10- 9- 8
116 7- 2- 4- 1-10- 6- 8- 3- 9- 5
117 2- 3- 4- 1- 5- 6- 7-10- 8- 9
118 2- 9- 3- 1- 6- 5- 7- 4- 8-10
119 10- 8- 6- 3- 1- 7- 2- 4- 5- 9
120 2- 4- 7- 1- 5-10- 6- 9- 3- 7
121 2- 1- 3- 5- 6- 7- 8- 9- 4-10
122 3- 4- 1- 2- 8- 9-10- 7- 5- 6
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TABLE B

The Foregoing Placements Compared

(Fractions and Per Cents)

Each vertical column checked with each of those that follows it (Column 1 with 2, 3, 4, etc.; 2 with 3, 4, 5, etc.)

Resultant Fractions and their Per Cent EquivalentsMANUAL ARTS TEACHER

As characteristics were placed by 32 state and federal supervisors.

	1	2	3	4	5	6	7	8	9	10
1 >	-----	16/32	-----	27/32	16/32	-----	-----	-----	-----	-----
2 >	16/32	-----	-----	29/32	-----	-----	-----	-----	-----	-----
3 >	22/32	23/32	-----	28/32	16/32	19/32	-----	-----	19/32	-----
4 >	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
5 >	16/32	17/32	16/32	20/32	-----	-----	-----	-----	-----	-----
6 >	20/32	17/32	-----	27/32	21/32	21/32	-----	-----	-----	-----
7 >	26/32	25/32	23/32	29/32	25/32	24/32	-----	17/32	22/32	-----
8 >	21/32	20/32	17/32	31/32	22/32	22/32	-----	-----	16/32	-----
9 >	18/32	10/32	-----	31/32	17/32	20/32	-----	16/32	-----	-----
10 >	26/32	28/32	25/32	31/32	26/32	30/32	21/32	22/32	29/32	-----

This table should be read "Column 1 is greater than 2 in 16/32 of the cases; 7 is greater than 4 in 29/32 of the cases. (The larger number occurs more often in vertical Column 1 than in vertical Column 5, etc. Table A, Appendix, Pages 75-87.

Subsequent fraction tables following refer likewise to Table A)

The Foregoing Expressed in Per Cents

	1	2	3	4	5	6	7	8	9	10
1 >	--	50	--	84	50	--	--	--	--	--
2 >	50	--	--	90	--	--	--	--	--	--
3 >	68	71	--	87	50	59	--	--	59	--
4 >	--	--	--	--	--	--	--	--	--	--
5 >	50	53	50	62	--	--	--	--	--	--
6 >	62	53	--	84	65	--	--	--	--	--
7 >	81	78	71	90	78	75	--	53	68	--
8 >	65	62	53	96	68	68	--	--	50	--
9 >	56	59	--	96	53	62	--	50	--	--
10 >	61	67	78	96	81	93	65	68	90	--

As characteristics were placed by 75 city supervisors of industrial and vocational education - cities of 50,000 and more population.

	1	2	3	4	5	6	7	8	9	10
1 >	-----	48/75	-----	49/75	41/75	43/75	-----	-----	-----	-----
2 >	-----	-----	-----	50/75	39/75	44/75	-----	-----	-----	-----
3 >	58/75	54/75	-----	60/75	47/75	50/75	-----	-----	-----	-----
4 >	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
5 >	-----	-----	-----	44/75	-----	-----	-----	-----	-----	-----
6 >	-----	-----	-----	46/75	38/75	-----	-----	-----	-----	-----
7 >	57/75	59/75	49/75	62/75	66/75	64/75	-----	-----	41/75	-----
8 >	58/75	63/75	53/75	72/75	57/75	60/75	45/75	-----	45/75	-----
9 >	49/75	48/75	42/75	66/75	49/75	54/75	-----	39/75	-----	-----
10 >	66/75	68/75	67/75	70/75	66/75	64/75	56/75	51/75	63/75	-----

The Foregoing Expressed in Per Cents

	1	2	3	4	5	6	7	8	9	10
1 >	--	64	--	65	55	57	--	--	--	--
2 >	--	--	--	67	52	59	--	--	--	--
3 >	78	72	--	80	63	67	--	--	--	--
4 >	--	--	--	--	--	--	--	--	--	--
5 >	--	--	--	59	--	--	--	--	--	--
6 >	--	--	--	61	51	--	--	--	--	--
7 >	76	79	65	83	88	85	--	--	55	--
8 >	78	84	71	96	76	80	60	--	60	--
9 >	65	64	56	88	65	72	--	52	--	--
10 >	88	91	89	93	88	85	75	68	84	--

As characteristics were placed by 54 heads of industrial and vocational teacher-training departments and institutions.

	1	2	3	4	5	6	7	8	9	10
1 >	-----	34/54	-----	46/54	32/54	29/54	-----	-----	-----	-----
2 >	-----	-----	-----	43/54	-----	-----	-----	-----	-----	-----
3 >	31/54	36/54	-----	49/54	39/54	32/54	-----	-----	-----	-----
4 >	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
5 >	-----	30/54	-----	32/54	-----	-----	-----	-----	-----	-----
6 >	-----	33/54	-----	40/54	36/54	-----	-----	-----	-----	-----
7 >	41/54	43/54	32/54	48/54	45/54	44/54	-----	28/54	34/54	-----
8 >	36/54	43/54	36/54	50/54	39/54	36/54	-----	-----	31/54	-----
9 >	34/54	37/54	31/54	51/54	34/54	31/54	-----	-----	-----	-----
10 >	50/54	49/54	46/54	52/54	50/54	49/54	45/54	40/54	48/54	-----

As characteristics were placed by 275 different individuals, the total number replying.

	1	2	3	4	5	6	7	8	9	10
1 >	-----	168/275	-----	201/275	-----	-----	-----	-----	-----	-----
2 >	-----	-----	-----	192/275	-----	-----	-----	-----	-----	-----
3 >	199/275	213/275	-----	240/275	169/275	159/275	-----	-----	145/275	-----
4 >	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
5 >	153/275	253/275	-----	175/275	-----	-----	-----	-----	-----	-----
6 >	162/275	167/275	-----	192/275	166/275	-----	-----	-----	-----	-----
7 >	221/275	223/275	180/275	231/275	234/275	223/275	-----	139/275	182/275	-----
8 >	209/275	229/275	170/275	259/275	189/275	183/275	-----	-----	172/275	-----
9 >	189/275	210/275	-----	249/275	149/275	158/275	-----	-----	-----	-----
10 >	242/275	253/275	232/275	262/275	222/275	218/275	19/275	200/275	242/275	-----

Per Cents

	1	2	3	4	5	6	7	8	9	10
1 >	--	61	--	73	--	--	--	--	--	--
2 >	--	--	--	69	--	--	--	---	--	--
3 >	72	77	--	87	61	58	--	--	53	--
4 >	--	--	--	--	--	--	--	--	--	--
5 >	55	93	--	63	--	--	--	--	--	--
6 >	59	61	--	72	60	--	--	--	--	--
7 >	80	81	61	83	80	81	--	51	67	--
8 >	71	83	61	94	69	66	--	--	63	--
9 >	68	76	--	95	54	57	--	--	--	--
10 >	90	92	89	96	80	79	69	73	87	--

GENERAL INDUSTRIAL TEACHER

As characteristics were placed by 31 state and federal supervisors.

	1	2	3	4	5	6	7	8	9	10
1 >	-----	16/31	-----	25/32	-----	-----	-----	19/31	-----	-----
2 >	-----	-----	-----	28/31	-----	-----	-----	16/31	-----	-----
3 >	25/31	24/31	-----	28/31	19/31	20/31	-----	24/31	21/31	-----
4 >	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
5 >	16/31	17/31	-----	20/31	-----	-----	-----	-----	-----	-----
6 >	30/31	19/31	-----	27/31	20/31	-----	-----	17/31	-----	-----
7 >	25/31	23/31	16/31	28/31	24/31	24/31	-----	-----	21/31	-----
8 >	-----	-----	-----	25/31	16/31	-----	17/31	-----	-----	-----
9 >	20/31	21/31	-----	29/31	17/31	17/31	-----	22/31	-----	-----
10 >	25/31	27/31	25/31	30/31	26/31	29/31	23/31	26/31	28/31	-----

Per Cents

	1	2	3	4	5	6	7	8	9	10
1 >	--	51	--	80	--	--	--	62	--	--
2 >	--	--	--	90	--	--	--	51	--	--
3 >	80	77	--	90	62	65	--	77	68	--
4 >	--	--	--	--	--	--	--	--	--	--
5 >	51	55	--	65	--	--	--	--	--	--
6 >	65	62	--	87	65	--	--	55	--	--
7 >	80	74	51	90	77	77	--	--	68	--
8 >	--	--	--	80	51	--	55	--	--	--
9 >	65	68	--	94	55	55	--	71	--	--
10 >	80	87	80	97	84	94	74	84	90	--

As characteristics were placed by 69 city supervisors of industrial and vocational education - cities of 50,000 and more population.

	1	2	3	4	5	6	7	8	9	10
1 >	-----	36/69	-----	41/69	-----	35/69	-----	-----	-----	-----
2 >	-----	-----	-----	42/69	-----	35/69	-----	-----	-----	-----
3 >	45/69	47/69	-----	58/69	43/69	47/69	-----	37/69	-----	-----
4 >	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
5 >	-----	35/69	-----	40/69	-----	-----	-----	-----	-----	-----
6 >	-----	-----	-----	44/69	37/69	-----	-----	-----	-----	-----
7 >	53/69	52/69	45/69	55/69	64/69	61/69	-----	40/69	39/69	-----
8 >	44/69	43/69	-----	60/69	46/69	45/69	-----	-----	-----	-----
9 >	57/69	54/69	38/69	61/69	57/69	48/69	-----	45/69	-----	-----
10 >	61/69	63/69	59/69	64/69	63/69	62/69	50/69	57/69	56/69	-----

Per Cents

	1	2	3	4	5	6	7	8	9	10
1 >	--	52	--	59	--	51	--	--	--	--
2 >	--	--	--	61	--	51	--	--	--	--
3 >	65	68	--	84	62	68	--	54	--	--
4 >	--	--	--	--	--	--	--	--	--	--
5 >	--	51	--	58	--	--	--	--	--	--
6 >	--	--	--	64	54	--	--	--	--	--
7 >	77	75	65	80	93	88	--	58	56	--
8 >	64	62	--	87	67	65	--	--	--	--
9 >	75	78	55	88	83	69	--	65	--	--
10 >	88	91	85	93	91	90	72	74	85	--

As characteristics were placed by 53 heads of industrial and vocational teacher-training departments and institutions.

	1	2	3	4	5	6	7	8	9	10
1 >	-----	33/53	-----	41/53	32/53	-----	-----	-----	-----	-----
2 >	-----	-----	-----	41/53	30/53	-----	-----	29/53	-----	-----
3 >	42/53	31/53	-----	40/53	46/53	32/53	-----	32/53	-----	-----
4 >	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
5 >	-----	-----	-----	29.53	-----	-----	-----	-----	-----	-----
6 >	29/53	29/53	-----	40/53	37/53	-----	-----	32/53	-----	-----
7 >	40/53	43/53	33/53	45/53	44/53	36/53	-----	35/53	36/53	-----
8 >	27.53	-----	45/53	30/53	-----	-----	-----	-----	-----	-----
9 >	36/53	33/53	30/53	50/53	32/53	27/53	-----	33/53	-----	-----
10 >	50/53	50/53	46/53	51/53	51/53	44/53	39/53	46/53	49/53	-----

Per Cents

	1	2	3	4	5	6	7	8	9	10
1 >	--	62	--	77	60	--	--	--	--	--
2 >	--	--	--	77	57	--	--	55	--	--
3 >	79	59	--	76	87	60	--	60	--	--
4 >	--	--	--	--	--	--	--	--	--	--
5 >	--	--	--	55	--	--	--	--	--	--
6 >	55	55	--	76	70	--	--	60	--	--
7 >	76	81	62	85	83	68	--	66	68	--
8 >	51	--	85	57	--	--	--	--	--	--
9 >	68	62	57	95	60	51	--	62	--	--
10 >	95	95	86	96	96	83	74	87	93	--

As characteristics were placed by 123 teachers in service and teachers in training.

	1	2	3	4	5	6	7	8	9	10
1 >	-----	85/123	-----	83/123	-----	-----	-----	-----	-----	-----
2 >	-----	-----	-----	77/123	-----	-----	-----	-----	-----	-----
3 >	89/123	104/123	-----	64/123	-----	-----	-----	79/123	75/123	--
4 >	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
5 >	89/123	86/123	66/123	94/123	-----	-----	-----	79/123	69/123	--
6 >	97/123	94/123	67/123	98/123	72/123	-----	-----	75/123	69/123	--
7 >	102/123	105/123	86/123	107/123	91/123	94/123	-----	91/123	89/123	--
8 >	63/123	80/123	-----	105/123	-----	-----	-----	-----	-----	-----
9 >	76/123	98/123	-----	109/123	-----	-----	-----	81/123	-----	-----
10 >	116/123	117/123	101/123	118/123	101/123	104/123	75/123	110/123	109/123	--

Per Cents

	1	2	3	4	5	6	7	8	9	10
1 >	--	69	--	67	--	--	--	--	--	--
2 >	--	--	--	63	--	--	--	--	--	--
3 >	72	85	--	52	--	--	--	64	61	--
4 >	--	--	--	--	--	--	--	--	--	--
5 >	72	70	54	77	--	--	--	64	56	--
6 >	79	77	54	80	59	--	--	61	56	--
7 >	83	85	70	87	74	76	--	74	72	--
8 >	51	65	--	85	--	--	--	--	--	--
9 >	62	80	--	89	--	--	--	66	--	--
10 >	94	95	82	96	82	85	61	90	89	--

As characteristics were placed by 276 different individuals, the total number replying.

	1	2	3	4	5	6	7	8	9	10
1 >	-----	170/276	-----	190/276	-----	-----	-----	-----	-----	-----
2 >	-----	-----	-----	168/276	-----	-----	-----	-----	-----	-----
3 >	191/276	206/276	-----	200/276	185/276	155/276	-----	172/276	150/276	-----
4 >	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
5 >	160/276	161/276	-----	183/276	-----	-----	-----	141/276	-----	-----
6 >	180/276	167/276	-----	209/276	166/276	-----	-----	148/276	-----	-----
7 >	220/276	223/276	180/276	235/276	223/276	225/276	-----	180/276	185/276	-----
8 >	146/276	161/276	-----	235/276	-----	-----	-----	-----	-----	-----
9 >	184/276	206/276	-----	249/276	150/276	146/276	-----	181/276	-----	-----
10 >	253/276	257/276	231/276	243/276	241/276	239/276	187/276	242/276	245/276	-----

Per Cents

	1	2	3	4	5	6	7	8	9	10
1 >	--	62	--	68	--	--	--	--	--	--
2 >	--	--	--	61	--	--	--	--	--	--
3 >	69	75	--	72	60	56	--	62	54	--
4 >	--	--	--	--	--	--	--	--	--	--
5 >	58	59	--	66	--	--	--	57	--	--
6 >	65	61	--	76	61	--	--	54	--	--
7 >	80	81	65	85	81	82	--	65	67	--
8 >	53	58	--	85	--	--	--	--	--	--
9 >	67	75	--	90	54	53	--	66	--	--
10 >	91	93	84	88	82	82	68	88	89	--

VOCATIONAL SHOP TEACHER

As characteristics were placed by 33 state and federal supervisors.

	1	2	3	4	5	6	7	8	9	10
1 >	-----	17/33	-----	29/33	-----	-----	-----	27/33	-----	-----
2 >	-----	-----	-----	31/33	-----	17/33	-----	29/33	-----	-----
3 >	28/33	28/33	-----	30/33	24/33	28/33	22/33	30/33	26/33	-----
4 >	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
5 >	17/33	17/33	-----	24/33	-----	-----	-----	22/33	-----	-----
6 >	20/33	-----	-----	28/33	18/33	-----	-----	26/33	-----	-----
7 >	27/33	25/33	-----	30/33	25/33	25/33	-----	29/33	21/33	-----
8 >	-----	-----	-----	26/33	-----	-----	-----	-----	-----	-----
9 >	20/33	21/33	-----	33/33	19/33	18/33	-----	32/33	-----	-----
10 >	30/33	31/33	22/33	33/33	32/33	31/33	20/33	33/33	29/33	-----

Per Cents

	1	2	3	4	5	6	7	8	9	10
1 >	--	51	--	88	--	--	--	82	--	--
2 >	--	--	--	94	--	51	--	88	--	--
3 >	85	85	--	91	73	85	67	91	79	--
4 >	--	--	--	--	--	--	--	--	--	--
5 >	51	51	--	73	--	--	--	67	--	--
6 >	61	--	--	85	55	--	--	79	--	--
7 >	82	76	--	91	76	76	--	88	64	--
8 >	--	--	--	79	--	--	--	--	--	--
9 >	61	64	--	100	58	55	--	97	--	--
10 >	91	94	67	100	97	94	61	100	88	--

As characteristics were placed by 75 city supervisors of industrial and vocational education - cities of 50,000 and more population.

	1	2	3	4	5	6	7	8	9	10
1 >	-----	44/75	-----	-----	41/75	39/75	-----	59/75	-----	-----
2 >	-----	-----	-----	64/75	-----	38/75	-----	53/75	-----	-----
3 >	64/75	67/75	-----	72/75	58/75	60/75	41/75	67/75	50/75	-----
4 >	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
5 >	-----	39/75	-----	50/75	-----	-----	-----	51/75	-----	-----
6 >	-----	-----	-----	52/75	41/75	-----	-----	45/75	-----	-----
7 >	47/75	59/75	-----	64/75	66/75	63/75	-----	58/75	43/75	-----
8 >	-----	-----	-----	58/75	-----	-----	-----	-----	-----	-----
9 >	48/75	61/75	-----	72/75	43/75	48/75	-----	66/75	-----	-----
10 >	68/75	69/75	53/75	72/75	67/75	67/75	58/75	67/75	68/75	-----

Per Cents

	1	2	3	4	5	6	7	8	9	10
1 >	--	59	--	--	55	52	--	79	--	--
2 >	--	--	--	87	--	51	--	71	--	--
3 >	85	89	--	96	78	50	55	89	87	--
4 >	--	--	--	--	--	--	--	--	--	--
5 >	--	52	--	67	--	--	--	68	--	--
6 >	--	--	--	69	55	--	--	60	--	--
7 >	63	79	--	85	88	84	--	78	57	--
8 >	--	--	--	78	--	--	--	--	--	--
9 >	64	81	--	96	57	64	--	88	--	--
10 >	91	92	69	96	89	89	78	89	91	--

As characteristics were placed by 54 heads of industrial and vocational teacher-training departments and institutions.

	1	2	3	4	5	6	7	8	9	10
1 >	-----	35/54	-----	51/54	-----	-----	-----	48/54	-----	-----
2 >	-----	-----	-----	49/54	-----	-----	-----	43/54	-----	-----
3 >	43/54	46/54	-----	54/54	37/54	43/54	28/54	53/54	44/54	-----
4 >	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
5 >	28/54	31/54	-----	38/54	-----	-----	-----	43/54	27/54	-----
6 >	30/54	35/54	-----	47/54	31/54	-----	-----	43/54	30/54	-----
7 >	43/54	46/54	-----	40/54	45/54	46/54	-----	49/54	43/54	-----
8 >	-----	-----	-----	45/54	-----	-----	-----	-----	-----	-----
9 >	28/54	29/54	-----	52/54	27/54	-----	-----	48/54	-----	-----
10 >	49/54	51/54	37/54	53/54	47/54	48/54	42/54	53/54	51/54	-----

Per Cents

	1	2	3	4	5	6	7	8	9	10
1 >	--	65	--	95	--	--	--	82	--	--
2 >	--	--	--	91	--	--	--	80	--	--
3 >	80	85	--	100	69	80	52	98	82	--
4 >	--	--	--	--	--	--	--	--	--	--
5 >	52	58	--	70	--	--	--	80	50	--
6 >	56	65	--	87	58	--	--	80	56	--
7 >	80	85	--	91	84	85	--	91	80	--
8 >	--	--	--	84	--	--	--	--	--	--
9 >	52	54	--	96	50	--	--	89	--	--
10 >	91	95	69	98	87	89	78	98	95	--

As characteristics were placed by 131 teachers in service and teachers in training.

	1	2	3	4	5	6	7	8	9	10
1 >	-----	93/131	-----	107/131	-----	-----	-----	90/131	-----	-----
2 >	-----	-----	-----	104/131	-----	-----	-----	85/131	-----	-----
3 >	114/131	125/131	-----	79/131	82/131	96/131	68/131	121/131	105/131	-----
4 >	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
5 >	84/131	88/131	-----	100/131	-----	-----	-----	87/131	-----	-----
6 >	83/131	97/131	-----	112/131	-----	-----	-----	94/131	-----	-----
7 >	101/131	101/131	-----	117/131	107/131	96/131	-----	101/131	88/131	-----
8 >	-----	-----	-----	105/131	-----	-----	-----	-----	-----	-----
9 >	88/131	90/131	-----	121/131	82/131	68/131	-----	96/131	-----	-----
10 >	125/131	119/131	83/131	126/131	96/131	87/131	79/131	126/131	121/131	-----

Per Cents

	1	2	3	4	5	6	7	8	9	10
1 >	--	71	--	82	--	--	--	69	--	--
2 >	--	--	--	79	--	--	--	65	--	--
3 >	87	95	--	60	63	73	52	92	80	--
4 >	--	--	--	--	--	--	--	--	--	--
5 >	64	67	--	76	--	--	--	66	--	--
6 >	63	74	--	86	--	--	--	72	--	--
7 >	77	77	--	90	82	73	--	77	67	--
8 >	--	--	--	80	--	--	--	--	--	--
9 >	67	69	--	92	63	52	--	73	--	--
10 >	95	91	63	96	73	66	60	96	92	--

As characteristics were placed by 293 different individuals, the total number replying.

	1	2	3	4	5	6	7	8	9	10
1 >	-----	189/293	-----	217/293	-----	-----	-----	220/293	-----	-----
2 >	-----	-----	-----	249/293	-----	-----	-----	210/293	-----	-----
3 >	249/293	266/293	-----	285/293	201/293	237/293	159/293	271/293	225/293	-----
4 >	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
5 >	163/293	175/293	-----	212/293	-----	-----	-----	183/293	-----	-----
6 >	169/293	185/293	-----	239/293	154/293	-----	-----	208/293	-----	-----
7 >	222/293	231/293	-----	260/293	243/293	235/293	-----	237/293	195/293	-----
8 >	-----	-----	-----	243/293	-----	-----	-----	-----	-----	-----
9 >	185/293	201/293	-----	278/293	154/293	154/293	-----	242/293	-----	-----
10 >	272/293	270/293	195/293	284/293	238/293	245/293	199/293	279/293	269/293	-----

Per Cents

98

	1	2	3	4	5	6	7	8	9	10
1 >	--	64	--	74	--	--	--	75	--	--
2 >	--	--	--	85	--	--	--	72	--	--
3 >	85	94	--	97	69	81	54	93	77	--
4 >	--	--	--	--	--	--	--	--	--	--
5 >	51	60	--	72	--	--	--	63	--	--
6 >	58	63	--	82	53	--	--	71	--	--
7 >	78	79	--	89	83	80	--	81	67	--
8 >	--	--	--	80	--	--	--	--	--	--
9 >	63	69	--	95	53	53	--	83	--	--
10 >	93	92	62	97	81	84	68	95	92	--

Related Subjects Teacher

As characteristics were placed by 33 state and federal supervisors.

	1	2	3	4	5	6	7	8	9	10	A
1 >	-----	-----	-----	26/33	-----	-----	-----	-----	-----	-----	-----
2 >	17/33	-----	-----	29/33	-----	-----	-----	-----	-----	-----	-----
3 >	23/33	22/33	-----	27/33	17/33	17/33	-----	17/33	-----	-----	-----
4 >	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
5 >	19/33	18/33	-----	24/33	-----	-----	-----	-----	-----	-----	-----
6 >	21/33	19/33	-----	28/33	21/33	-----	-----	-----	-----	-----	-----
7 >	27/33	26/33	23/33	30/33	25/33	30/33	-----	20/33	19/33	-----	-----
8 >	20/33	20/33	-----	30/33	17/33	19/33	-----	-----	-----	-----	-----
9 >	21/33	22/33	18/33	32/33	20/33	17/33	-----	22/33	-----	-----	-----
10 >	29/33	32/33	29/33	33/33	31/33	32/33	26/33	26/33	28/33	-----	-----

Per Cents

	1	2	3	4	5	6	7	8	9	10
1 >	--	--	--	79	--	--	--	--	--	--
2 >	51	--	--	88	--	--	--	--	--	--
3 >	70	67	--	82	51	51	--	51	--	--
4 >	--	--	--	--	--	--	--	--	--	--
5 >	58	55	--	73	--	--	--	--	--	--
6 >	64	58	--	85	64	--	--	--	--	--
7 >	82	79	70	91	76	91	--	61	58	--
8 >	61	61	--	91	51	58	--	--	--	--
9 >	64	67	55	97	61	51	--	67	--	--
10 >	88	97	88	100	94	97	79	79	85	--

As characteristics were placed by 74 city supervisors of industrial and vocational education - cities of 50,000 and more population.

	1	2	3	4	5	6	7	8	9	10
1 >	-----	37/74	38/74	54/74	39/74	40/74	-----	-----	-----	-----
2 >	37/74	-----	39/74	59/74	38/74	42/74	-----	-----	-----	-----
3 >	-----	-----	-----	52/74	40/74	40/74	-----	-----	-----	-----
4 >	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
5 >	-----	-----	-----	47/74	-----	-----	-----	-----	-----	-----
6 >	-----	-----	-----	46/74	39/74	-----	-----	-----	-----	-----
7 >	50/74	56/74	56/74	63/74	66/74	64/74	-----	43/74	41/74	-----
8 >	47/74	44/74	44/74	63/74	44/74	44/74	-----	-----	-----	-----
9 >	50/74	54/74	46/74	69/74	43/74	49/74	-----	40/74	-----	-----
10 >	62/74	58/74	59/74	70/74	60/74	63/74	47/74	54/74	57/74	-----

Per Cents

	1	2	3	4	5	6	7	8	9	10
1 >	--	50	51	73	53	54	--	--	--	--
2 >	50	--	53	80	51	57	--	--	--	--
3 >	--	--	--	70	54	54	--	--	--	--
4 >	--	--	--	--	--	--	--	--	--	--
5 >	--	--	--	63	--	--	--	--	--	--
6 >	--	--	--	62	53	--	--	--	--	--
7 >	68	76	76	85	89	86	--	58	55	--
8 >	63	59	59	85	59	59	--	--	--	--
9 >	68	73	62	93	58	66	--	54	--	--
10 >	84	78	80	94	81	85	63	73	77	--

As characteristics were placed by 54 heads of industrial and vocational teacher-training departments and institutions.

	1	2	3	4	5	6	7	8	9	10
1 >	-----	29/54	30/54	44/54	28/54	27/54	-----	-----	-----	-----
2 >	-----	-----	28/54	46/54	30/54	27/54	-----	27/54	29/54	-----
3 >	-----	-----	-----	46/54	31/54	-----	-----	-----	-----	-----
4 >	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
5 >	-----	-----	-----	36/54	-----	-----	-----	-----	-----	-----
6 >	27/54	33/54	34/54	47/54	40/54	-----	-----	28/54	30/54	-----
7 >	38/54	40/54	39/54	49/54	46/54	47/54	-----	37/54	35/54	-----
8 >	28/54	27/54	32/54	52/54	28/54	-----	-----	-----	-----	-----
9 >	30/54	27/54	39/54	53/54	29/54	-----	-----	28/54	-----	-----
10 >	49/54	45/54	48/54	52/54	48/54	47/54	41/54	44/54	51/54	-----

Per Cents

	1	2	3	4	5	6	7	8	9	10
1 >	--	54	56	82	52	50	--	--	--	--
2 >	--	--	52	85	56	50	--	50	54	--
3 >	--	--	--	85	58	--	--	--	--	--
4 >	--	--	--	--	--	--	--	--	--	--
5 >	--	--	--	67	--	--	--	--	--	--
6 >	50	61	63	87	74	--	--	52	56	--
7 >	70	74	72	91	85	87	--	69	65	--
8 >	52	50	59	96	52	--	--	--	--	--
9 >	56	50	72	98	54	--	--	52	--	--
10 >	89	84	89	96	89	87	76	82	95	--

As characteristics were placed by 122 teachers-in-service and teachers-in-training.

	1	2	3	4	5	6	7	8	9	10
1 >	-----	72/122	61/122	95/122	-----	-----	-----	-----	-----	-----
2 >	-----	-----	61/122	93/122	-----	-----	-----	-----	-----	-----
3 >	61/122	61/122	-----	74/122	-----	-----	-----	-----	-----	-----
4 >	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
5 >	92/122	90/122	75/122	98/122	-----	-----	-----	70/122	76/122	--
6 >	86/122	74/122	75/122	101/122	83/122	-----	-----	-----	73/122	--
7 >	103/122	102/122	100/122	109/122	103/122	66/122	-----	-----	93/122	--
8 >	75/122	94/122	66/122	109/122	-----	62/122	79/122	-----	83/122	--
9 >	89/122	83/122	81/122	110/122	-----	-----	-----	-----	-----	-----
10 >	112/122	115/122	109/122	116/122	83/122	99/122	74/122	95/122	87/122	--

Per Cents

	1	2	3	4	5	6	7	8	9	10
1 >	--	59	50	78	--	--	--	--	--	--
2 >	--	--	50	76	--	--	--	--	--	--
3 >	50	50	--	61	--	--	--	--	--	--
4 >	--	--	--	--	--	--	--	--	--	--
5 >	75	74	61	80	--	--	--	57	62	--
6 >	70	61	61	83	68	--	--	--	60	--
7 >	85	84	82	90	85	54	--	--	76	--
8 >	61	77	54	90	--	51	65	--	68	--
9 >	73	68	66	91	--	--	--	--	--	--
10 >	92	94	90	95	67	81	61	78	71	--

As characteristics were placed by 283 different individuals
the total number replying.

	1	2	3	4	5	6	7	8	9	10
1 >	-----	156/283	-----	213/283	-----	-----	-----	-----	-----	-----
2 >	-----	-----	-----	227/283	-----	-----	-----	-----	-----	-----
3 >	142/283	146/283	-----	199/283	-----	-----	-----	-----	-----	-----
4 >	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
5 >	172/283	168/283	147/283	167/283	-----	-----	-----	142/283	146/283	-----
6 >	168/283	162/283	154/283	219/283	176/283	-----	-----	-----	144/283	-----
7 >	213/283	224/283	218/283	251/283	240/283	207/283	-----	144/283	188/283	-----
8 >	170/283	185/283	158/283	254/283	-----	151/283	-----	-----	154/283	-----
9 >	190/283	186/283	175/283	265/283	-----	-----	-----	-----	-----	-----
10 >	251/283	250/283	245/283	271/283	218/283	24/283	188/283	221/283	223/283	-----

Per Cents

	1	2	3	4	5	6	7	8	9	10
1 >	--	55	--	75	--	--	--	--	--	--
2 >	--	--	--	79	--	--	--	--	--	--
3 >	50	51	--	70	--	--	--	--	--	--
4 >	--	--	--	--	--	--	--	--	--	--
5 >	60	59	51	56	--	--	--	50	51	--
6 >	60	57	54	72	62	--	--	--	50	--
7 >	75	79	71	88	84	72	--	50	61	--
8 >	59	65	55	89	--	53	--	--	54	--
9 >	67	65	61	93	--	--	--	--	--	--
10 >	88	87	86	95	71	84	66	77	78	--

TABLE C
 THE FOREGOING EXPRESSED IN P. E. NUMBERS
 MANUAL ARTS TEACHER
 BY STATE AND FEDERAL SUPERVISORS

	1	2	3	4	5	6	7	8	9	10
1 >	----	.00	----	1.47	-.00	----	----	----	----	----
2 >	.00	----	----	1.90	----	----	----	----	----	----
3 >	.69	.82	----	1.67	.00	.33	----	----	.33	----
4 >	----	----	----	----	----	----	----	----	----	----
5 >	.00	.11	.00	.45	----	----	----	----	----	----
6 >	.45	.11	----	1.47	.57	----	----	----	----	----
7 >	1.30	1.14	.82	1.90	1.14	1.00	----	.11	.69	----
8 >	.57	.45	.11	2.59	.69	----	----	----	.00	----
9 >	.22	.33	----	2.59	.11	.45	----	.00	----	----
10 >	1.30	1.67	1.14	2.59	1.30	2.18	.57	.69	1.90	----

BY CITY SUPERVISORS

	1	2	3	4	5	6	7	8	9	10
1 >	----	.53	----	.57	.18	.26	----	----	----	----
2 >	----	----	----	.65	.07	.33	----	----	----	----
3 >	1.14	.86	----	1.24	.49	.65	----	----	----	----
4 >	----	----	----	----	----	----	----	----	----	----
5 >	----	----	----	.33	----	----	----	----	----	----
6 >	----	----	----	.41	.03	----	----	----	----	----
7 >	1.04	1.19	.57	1.41	1.74	1.53	----	----	.18	----
8 >	1.14	1.47	.82	2.59	1.04	1.24	.37	----	.37	----
9 >	.57	.53	.22	1.74	.57	.86	----	.07	----	----
10 >	1.74	1.98	1.81	2.18	1.74	1.53	1.00	.69	1.47	----

BY TEACHER-TRAINING HEADS

	1	2	3	4	5	6	7	8	9	10
1 >	----	.49	----	1.53	.33	.14	----	----	----	----
2 >	----	----	----	1.24	----	----	----	----	----	----
3 >	.29	.65	----	1.98	.86	.33	----	----	----	----
4 >	----	----	----	----	----	----	----	----	----	----
5 >	----	.22	----	.33	----	----	----	----	----	----
6 >	----	.41	----	.95	.65	----	----	----	----	----
7 >	1.04	1.24	.33	1.81	1.47	1.35	----	.07	.49	----
8 >	.65	1.24	.65	2.18	.86	.65	----	----	.29	----
9 >	.49	.73	.29	2.43	.49	.29	----	----	----	----
10 >	2.18	1.98	1.53	2.59	2.98	1.98	1.47	.95	1.81	----

By Teachers in Service and in Training

	1	2	3	4	5	6	7	8	9	10
1 >	----	.45	----	.73	----	----	----	----	----	----
2 >	----	----	----	.41	----	----	----	----	----	----
3 >	1.53	1.67	----	1.90	.29	.00	----	----	.41	----
4 >	----	----	----	----	----	----	----	----	----	----
5 >	.82	.57	----	.73	----	----	----	----	.29	----
6 >	.95	1.00	.00	.26	.45	----	----	----	.14	----
7 >	1.53	1.30	.61	1.53	1.53	1.19	----	.22	.95	----
8 >	1.35	1.81	.22	2.18	.45	.26	----	----	.77	----
9 >	1.09	1.47	----	1.74	----	----	----	----	----	----
10 >	2.18	2.30	1.35	2.43	.77	.57	.33	1.04	1.81	----

GENERAL INDUSTRIAL TEACHER

By State and Federal Supervisors

	1	2	3	4	5	6	7	8	9	10
1 >	----	.03	----	1.24	----	----	----	.45	----	----
2 >	----	----	----	1.90	----	----	----	.03	----	----
3 >	1.24	1.09	----	1.90	.45	.57	----	1.09	.69	----
4 >	----	----	----	----	----	----	----	----	----	----
5 >	.03	.18	----	.57	----	----	----	----	----	----
6 >	.57	.45	----	1.67	.57	----	----	.18	----	----
7 >	1.24	.95	.03	1.90	1.09	1.09	----	----	.69	----
8 >	----	----	----	1.24	.03	----	.18	----	----	----
9 >	.57	.69	----	2.30	.18	.18	----	.82	----	----
10 >	1.24	1.67	1.24	2.78	1.47	2.30	.95	1.47	1.90	----

By City Supervisors

	1	2	3	4	5	6	7	8	9	10
1 >	----	.07	----	.33	.03	.03	.03	----	----	----
2 >	----	----	----	.41	----	.03	----	----	----	----
3 >	.57	.69	----	1.47	.45	.69	----	.14	----	----
4 >	----	----	----	----	----	----	----	----	----	----
5 >	----	.03	----	.29	----	----	----	----	----	----
6 >	----	----	----	.53	.14	----	----	----	----	----
7 >	1.09	1.00	.57	1.24	2.18	1.74	----	.29	.22	----
8 >	.53	.45	----	1.67	.65	.57	----	----	----	----
9 >	1.00	1.14	.18	1.74	1.41	.73	----	.57	----	----
10 >	1.74	1.98	1.53	2.18	1.98	1.90	.86	.96	1.53	----

By Teacher Training Heads

	1	2	3	4	5	6	7	8	9	10
1 >	----	.45	----	1.09	.37	----	----	----	----	----
2 >	----	----	----	1.09	.26	----	----	.18	----	----
3 >	1.19	.33	----	1.04	1.67	.37	----	.37	----	----
4 >	----	----	----	----	----	----	----	----	----	----
5 >	----	----	----	.18	----	----	----	----	----	----
6 >	.18	.18	----	1.04	.77	----	----	.37	----	----
7 >	1.04	1.30	.45	1.53	1.41	.69	----	.61	.69	----
8 >	.03	----	1.53	.26	.26	----	----	----	----	----
9 >	.69	.45	.26	2.43	.37	.03	----	.45	----	----
10 >	2.43	2.43	1.67	2.59	2.59	1.41	.95	1.67	2.18	----

By Teachers in Service and in Training

	1	2	3	4	5	6	7	8	9	10
1 >	----	.73	----	.65	----	----	----	----	----	----
2 >	----	----	----	.49	----	----	----	----	----	----
3 >	.86	1.53	----	.07	----	----	----	.53	.41	----
4 >	----	----	----	----	----	----	----	----	----	----
5 >	.86	.77	.14	1.09	----	----	----	.53	.22	----
6 >	1.19	1.09	.14	1.24	.33	----	----	.41	.22	----
7 >	1.45	1.53	.77	1.67	.95	1.04	----	.95	.86	----
8 >	.03	.57	----	1.53	----	----	----	----	----	----
9 >	.45	1.24	----	1.81	----	----	----	.61	----	----
10 >	2.30	2.43	1.35	2.59	1.35	1.53	.41	1.90	1.81	----

Vocational Shop Teacher

By State and Federal Supervisors

	1	2	3	4	5	6	7	8	9	10
1 >	-----	.03	-----	1.74	-----	-----	-----	1.35	-----	----
2 >	-----	-----	-----	2.30	-----	.03	-----	1.74	-----	----
3 >	1.53	1.53	-----	1.98	.90	1.53	.63	1.98	1.19	----
4 >	-----	-----	-----	-----	-----	-----	-----	-----	-----	----
5 >	.03	.03	-----	.90	-----	-----	-----	.65	-----	----
6 >	.41	-----	-----	1.53	.18	-----	-----	1.19	-----	----
7 >	1.35	1.04	-----	1.98	1.04	1.04	-----	1.74	.53	----
8 >	-----	-----	-----	-----	-----	-----	-----	-----	-----	----
9 >	.41	.53	-----	5.00	.29	.18	-----	2.78	-----	----
10 >	1.98	2.30	.65	5.00	2.78	2.30	.41	5.00	1.74	----

By City Supervisors

	1	2	3	4	5	6	7	8	9	10
1 >	----	.33	----	.37	.18	.07	----	1.19	----	----
2 >	----	----	----	1.67	----	.03	----	.82	----	----
3 >	1.53	1.81	----	2.59	1.14	1.24	.18	1.81	.65	----
4 >	----	----	----	----	----	----	----	----	----	----
5 >	----	.07	----	.65	----	----	----	.69	----	----
6 >	----	----	----	.73	.18	----	----	.37	----	----
7 >	.49	1.19	----	1.53	1.74	1.47	----	1.14	.26	----
8 >	----	----	----	1.14	----	----	----	----	----	----
9 >	.53	1.30	----	2.59	.26	.53	----	1.74	----	----
10 >	1.98	2.08	.73	2.59	1.81	1.81	1.14	1.81	1.98	----

By Teacher-Training Heads

	1	2	3	4	5	6	7	8	9	10
1 >	----	.57	----	2.43	----	----	----	1.35	----	----
2 >	----	----	----	1.98	----	----	----	1.24	----	----
3 >	1.24	1.53	----	5.00	.73	1.24	.07	3.04	1.35	----
4 >	----	----	----	----	----	----	----	----	----	----
5 >	.07	.29	----	.77	----	----	----	1.24	.00	----
6 >	.22	.57	----	1.67	.29	----	----	1.24	.24	----
7 >	1.24	1.53	----	1.98	1.47	1.53	----	1.98	1.24	----
8 >	----	----	----	1.47	----	----	----	----	----	----
9 >	.07	.14	----	2.49	.00	----	----	1.81	----	----
10 >	1.98	2.43	.73	3.04	1.67	1.81	1.14	3.04	2.43	----

By Teachers in Service and in Training

	1	2	3	4	5	6	7	8	9	10
1 >	----	.82	----	1.35	----	----	----	.73	----	----
2 >	----	----	----	1.19	----	----	----	.57	----	----
3 >	1.67	2.43	----	.37	.49	.90	.07	2.08	1.24	----
4 >	----	----	----	----	----	----	----	----	----	----
5 >	.53	.65	----	1.04	----	----	----	.61	----	----
6 >	.49	.95	----	1.60	----	----	----	.86	----	----
7 >	1.09	1.09	----	1.90	1.35	.90	----	1.09	.65	----
8 >	----	----	----	1.24	----	----	----	----	----	----
9 >	.65	.73	----	2.08	.49	.07	----	.90	----	----
10 >	2.43	1.98	.49	2.59	.90	.61	.37	2.59	2.08	----

RELATED SUBJECTS TEACHER

By State and Federal Supervisors

	1	2	3	4	5	6	7	8	9	10
1 >	----	----	----	1.19	----	----	----	----	----	----
2 >	.03	----	----	1.74	----	----	----	----	----	----
3 >	.77	.65	----	1.35	.03	.03	----	.03	----	----
4 >	----	----	----	----	----	----	----	----	----	----
5 >	.30	.18	----	.90	----	----	----	----	----	----
6 >	.53	.29	----	1.53	.53	----	----	----	----	----
7 >	1.35	1.19	.77	1.98	1.04	1.98	----	.41	.29	----
8 >	.41	.41	----	1.98	.03	.29	----	----	----	----
9 >	.53	.65	.18	2.78	.41	.03	----	.65	----	----
10 >	1.74	2.78	1.74	5.00	2.30	2.78	1.19	1.19	1.53	----

By City Supervisors

	1	2	3	4	5	6	7	8	9	10
1 >	----	.00	.04	.91	.11	.15	----	----	----	----
2 >	.00	----	.11	1.24	.04	.28	----	----	----	----
3 >	----	----	----	.77	.15	.25	----	----	----	----
4 >	----	----	----	----	----	----	----	----	----	----
5 >	----	----	----	.49	----	----	----	----	----	----
6 >	----	----	----	.45	.11	----	----	----	----	----
7 >	.69	1.04	1.04	1.53	1.82	1.60	----	.30	.18	----
8 >	.49	.33	.33	1.53	.33	.33	----	----	----	----
9 >	.69	.91	.45	2.18	.30	.61	----	.15	----	----
10 >	1.47	1.14	1.24	2.30	1.30	1.53	.49	.91	1.09	----

By Teacher-Training Heads

	1	2	3	4	5	6	7	8	9	10
1 >	----	.14	.22	1.35	.07	.00	----	----	----	----
2 >	----	----	.07	1.53	.22	.00	----	.00	.14	----
3 >	----	----	----	1.53	.29	----	----	----	----	----
4 >	----	----	----	----	----	----	----	----	----	----
5 >	----	----	----	.65	----	----	----	----	----	----
6 >	.00	.41	.49	1.67	.95	----	----	.07	.22	----
7 >	.77	.95	.86	1.98	1.53	1.67	----	.73	.57	----
8 >	.07	.00	.33	2.59	.07	----	----	----	----	----
9 >	.22	.00	.86	3.04	.14	----	----	.07	----	----
10 >	1.81	1.47	1.81	2.59	1.81	1.67	1.04	1.35	2.43	----

By Teachers in Service and in Training

	1	2	3	4	5	6	7	8	9	10
1 >	----	.33	.00	1.14	----	----	----	----	----	----
2 >	----	----	.00	1.04	----	----	----	----	----	----
3 >	.00	.00	----	.41	----	----	----	----	----	----
4 >	----	----	----	----	----	----	----	----	----	----
5 >	1.00	.95	.41	1.24	----	----	----	.26	.45	----
6 >	.77	.41	.41	1.41	.69	----	----	----	.37	----
7 >	1.53	1.47	1.35	1.90	1.53	.14	----	----	1.04	----
8 >	.41	1.09	.14	1.90	----	.03	-.57	----	.69	----
9 >	.90	.69	.61	1.98	----	----	----	----	----	----
10 >	2.08	2.30	1.90	2.43	.65	1.30	.41	1.14	.78	----

TABLE D

DISTANCES FROM ARBITRARY ZERO
or
POINT OF LEAST IMPORTANCE

By State and Federal Supervisors

0	.57	.68	1.58	1.06	1.36	1.50	1.50	1.59	2.90
10	7	8	9	3	5	6	2	1	4

By City Supervisors

0	.69	.86	1.26	1.60	1.84	1.90	2.03	2.04	2.69
10	8	7	9	3	5	1	2	6	4

By Teacher-Training Heads

0	.95	1.04	1.52	1.64	1.88	1.93	2.23	2.28	3.20
10	8	7	9	3	6	1	2	5	4

By Teachers in Service and in Training

0	.33	.79	1.05	1.08	1.26	1.31	2.10	2.23	2.38
10	7	8	6	3	9	5	1	2	4

GENERAL INDUSTRIAL TEACHER

By State and Federal Supervisors

0	.89	.95	1.51	1.59	1.73	1.75	1.81	1.89	2.91
10	3	7	6	8	1	5	2	9	4

By City Supervisors

0	.86	1.47	1.53	1.55	2.10	2.12	2.19	2.35	2.67
10	7	8	9	3	1	2	6	5	4

By Teacher-Training Heads

0	.95	1.53	1.58	1.78	2.08	2.13	2.18	2.64	2.74
10	7	3	9	6	8	1	2	5	4

By Teachers in Service and in Training

0	.41	1.04	1.17	1.24	1.26	1.38	1.81	2.00	2.19
10	7	6	9	5	3	8	1	2	4

VOCATIONAL SHOP TEACHER

By State and Federal Supervisor

0	.41	1.02	2.30	2.42	2.47	2.49	2.97	3.93	4.29
10	7	3	6	2	1	5	9	8	4

By City Supervisors

0	.73	1.02	1.54	2.00	2.06	2.10	2.36	2.59	3.24
10	3	7	9	1	5	6	2	8	4

By Teacher-Training Heads

0	.73	.97	1.38	1.90	1.91	2.02	2.28	3.20	4.07
10	3	7	1	6	9	5	2	8	4

By Teachers in Training and in Service

0	.45	.64	1.07	1.60	1.67	1.92	2.22	2.58	3.04
10	3	7	5	9	6	1	2	8	4

RELATED SUBJECTS TEACHER

By State and Federal Supervisors

0	1.19	1.49	1.50	1.61	1.80	2.12	2.19	2.27	3.79
10	7	6	9	8	3	1	5	2	4

By City Supervisors

0	.49	.93	.94	1.40	1.41	1.42	1.56	1.61	2.35
10	7	8	9	2	3	1	5	6	4

By Teacher-Training Heads

0	1.04	1.79	1.82	1.84	1.94	2.02	2.12	2.19	3.42
10	7	8	2	6	1	9	3	5	4

By Teachers in Service and in Training

0	.41	.90	.92	1.14	1.17	1.63	1.82	1.95	2.44
10	7	8	6	5	9	3	2	1	4

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