

Abstract of Thesis.

"An Investigation into Assessment of Teaching Ability in Teachers of Technical Subjects"

by
W.A. Skinner.

Throughout the present century many workers, while aiding the considerable progress in the objective measurement of teaching ability, have expressed concern at the elusiveness of any sound technique for its assessment.

Accounts of previous research work into the assessment of teaching ability show that at least eleven different approaches to the problem have been made. A review of this literature reveals that whereas within each form of approach, stress has been laid on teacher traits and groups of traits having much in common, yet, when the criteria within the different approaches are compared, there is marked diversity between observers as to what is meant by good or poor teaching ability.

A new line of attack is suggested and explored by considering teaching activities as being the sum total of the interactions between the three focal centres, namely, the teacher, the pupil and the subject. These interactions are dynamic and bi-directional, and within the analysis are pursued to a third order, for example, the interaction of the teacher on the pupil through the medium of the subject. These interactions in the first place, are analytical concepts, yet, with few exceptions, contain the descriptive traits and qualities used by previous workers. To test the analysis a rating scale of teaching ability has been devised and applied to 333 class-room lessons given by teachers of varied technical subjects following a one-year professional teacher-training course.

The data derived shows the relative importance attached to the concepts by the assessors employed. Analysis by pooling square methods and regression technique indicates that the rating scale will yield a best expected multiple correlation of 0.76 with a global teaching mark. A shortened form is also evolved. From a factorial analysis, three factors have been extracted and a psychological interpretation suggested both before and after rotation of the axes.

"An Investigation into Assessment of
Teaching Ability in Teachers of
Technical Subjects"

by

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SECTION I - Origin of the Investigation.

In most studies relating to teacher selection and teacher prediction, failures and successes among teachers, and allied fields where a criterion of teaching ability was necessary, the validity of the interpretation of the results has rested upon the stability of the criterion employed. Many investigators have expressed and are still expressing concern because of the elusiveness of any sound technique for assessing teaching ability. Indeed, Myers (1) in putting the question in 1932 "What makes good teachers good?" confirmed this important difficulty in the way of research workers when he affirmed that "there is a lack of agreement as to what constitutes good teaching". Seyfert and Tyndal (2) maintained, two years later, that of all the factors entering into the process of educational research, teaching ability had most stubbornly refused to submit itself to objective evaluation. Again, Barr (3) who had pursued many investigations in America into the problem of the measurement of teaching ability, considered that, even at training college level, controversial issues arise when attempts are made to determine in an accurate and detailed way just what constitutes "successful teaching" and which characteristics of teaching make teachers successful. Two years later, Sandiford and others (4) in their review of the literature on the prediction of teaching ability, commented that "whatever may be defined accurately may be measured accurately, but teaching success does not fall into this category".

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1. Myers, A.F. (1932). "An Evaluation of Research on Teacher Preparation". J.Ed.Res., Vol. XXVI, Nov. No.3, p.162.
 2. Seyfert, W.S. and Tyndal, B.S. (1934). "An Evaluation of Differences in Teaching Ability". J. Ed. Res., Vol. XXVIII, p. 10.
 3. Barr, A.S. (1935). "The Measurement of Teacher Ability". J. Ed. Res., Vol. XXVIII, No. 8, Sept., p. 561.
 4. Sandiford, P., Cameron, M.A., Conway, C.B., Long, J.A., (1937). "Forecasting Teaching Ability", (Bulletin No.8, Department of Educational Research) Toronto.

In a more recent publication, Barr (5), while paying tribute, in a review of the literature, to the considerable progress that has been made in the objective measurement of teaching efficiency, stresses that "much more needs to be done" and that "new instruments of measurements will need to be constructed and validated". The writer has himself experienced the same difficulty (6). In fact, the ultimate value of the findings of his investigations depended 'materially upon the criterion of teaching ability employed' (6a) and it was the recognition of the existence of this difficulty that led to the present investigation.

It is interesting to observe at this point that a wider and more extensive research (related to the work of training colleges in England and Wales) bearing on the topic of this investigation (7) is being conducted by a research team under Fletcher at the Research Centre of the Institute of Education, University of Bristol, being 'a critical examination of the assessment and examination methods at present used in training colleges'.

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5. Barr, A.S. (1941). "Encyclopedia of Educational Research" Teacher Efficiency, p. 1281. The Macmillan Company.
 6. Skinner, W.A. (1947). "An Investigation of Factors Useful in Predicting Teaching Ability (with special reference to the teaching of Mathematics and Science)". Unpublished thesis for the M.Ed. degree of the University of Manchester.
 - 6a. ibid. Section IX para. 7, p. 84.
 7. Fletcher, B.A. (1948). "A Year's Work and Planning in an Area Training Organization". The Bulletin of Education. The Association of Teachers in Colleges and Departments of Education. No. 17, December, p.2.

The present study is an investigation into the assessment of teaching ability in teachers of technical subjects. It attempts in the next section a survey of some of the previous studies which have contributed towards a progressive, but nevertheless still partial, understanding of this ability, by a consideration of evidence drawn from research material needing a criterion of teaching ability. This survey is factual. It is followed by an analytical approach into the teaching situation whereby fifteen concepts, of an abstract nature, are extracted and defined. Traits and qualities of teaching ability mentioned by previous workers have been used to aid the identification of these concepts and, through this technique, to distinguish and appreciate those aspects of teaching ability which have been emphasized at the expense of others in earlier studies.

By defining an assessment of teaching ability as the sum-total of these concepts, Section III describes the experimental set-up which puts the principle to the test. The data and results of the experiment follow at Section IV, which concludes with a preliminary analysis. The results are further analysed in Section VI by using multiple correlation and factorial techniques. Three factors of teaching ability have been extracted and a psychological interpretation suggested, both before and after rotation of the axes.

The bibliography following Section VI is arranged in numbered sequence according to the order with which it is presented within the text.

SECTION II - Previous work on the assessment of teaching ability

a. Review of methods employed.

As early as 1917, Pittenberger (8) maintained that teaching efficiency may be assessed on one of the three planes: -

- a. the plane of results, that is, measurable changes in pupil performances in consequence of teaching,
- b. the plane of the teaching and learning process,
- c. the plane of the teacher's equipment for teaching.

It has since been proposed by Cattell (9) that only the plane of results offers a true basis of measurement. A survey of the work in this field will be given at paragraph .C. of this Section.

More recently Barr (5), in a review of the researches, mainly American, in the field of the measurement of teaching ability, indicates that previous investigations have, in general, dealt with two closely related topics. One group has concerned itself with a consideration of the traits and qualities essential to success in teaching through
 "(a) studies of why teachers fail; (b) compilations of the opinions of pupils; (c) summaries of expert opinion; (d) studies of good and bad teachers; (e) correlation studies of factors related to teaching success." The second group

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8. Quoted by Daldy, D.M. (1937). "Adaptability in a group of Teachers". J.Ed.Res., Vol. VII, p.3.
 9. Cattell, R.B. (1931). "The Assessment of Teaching Ability". Brit. J. Ed. Psy., Vol. I, Part 1, p.6.
 5. Barr, A.S. (1941). The Encyclopedia of Educational Research.

of investigators have been more concerned with the direct measurement of teaching success by (a) "evaluation of the performance of the teacher in the class-room through the use of check lists, rating scales"; (b) measurement of traits and "qualities of the teacher commonly associated with teaching success", for example, intelligence, personality, cultural background, emotional stability, etc., through the use of tests and other observational devices; and "(c) measurement of changes in pupil growth and achievement" (5).

However, at least eleven fundamentally different approaches are reported in studies to be found in the educational literature of this country and America, which are directly or indirectly linked with the problem of the assessment of teaching ability. These approaches are: -

- a. The rating of teaching performances through the use of rating scales, check lists and the like, with or without descriptive scale terms.
- b. The measurement of teaching performances by attempts to measure the change in pupil growth and attainment after a teaching period.
- c. By compilations of the opinions of desirable teacher qualities as expressed by pupils and training college students.
- d. By studies of failures among teachers.
- e. By studies of successes among teachers.
- f. By studies of the causes which have led teachers to leave the profession.
- g. By investigations employing self-assessment techniques.
- h. Through studies of the pre-selection of teachers.
- i. By studies of the opinions of supervisors on teaching qualities expected in student-teachers during courses of training.
- j. By studies involving the measurement of qualities usually associated with teaching success (as for example, in the prediction of teaching ability and vocational guidance).
- k. By studies of the expressed opinions of educationists.

Some aspects of the contribution which each approach has made to a fuller understanding of the assessment of teaching ability follow, under the sub-headings of this section. It will be seen that although it is apparent that those who, for various reasons, find themselves called upon to assess teaching ability are able fairly well to crystallize their interpretation of what they mean by teaching ability when they see it, yet it is equally apparent that there is diversity between observers in the same field and marked diversity between observers in different fields of what constitutes a good or bad teaching ability.

b. Studies of teacher assessment through rating scales.

One of the earliest experimental attempts in this country to test a choice of qualities for a rating scale of teachers was made by Thomson (10) in 1921. By considering outside opinions on desirable teacher qualities, together with his staff's knowledge of students, and after discussions at staff meetings, Thomson selected the following five headings for his rating scale: -

- I. Care in preparation.
- II. Logical explanation and questioning.
- III. Blackboard and other illustrations.
- IV. Voice, manner and power of arousing enthusiasm.
- V. Power of interesting children, keeping them busy, and getting results.

Although Thomson was aware that the choice could be much improved and that overlapping did exist, he claimed that such overlapping was "minimised by conference and definition" (p. 78). At the outset, the form and use of the rating scale followed the current American Army plan almost in detail (11), whereby a numerical value was given to each quality by comparison with a reservoir of names of known persons from which teachers were chosen as standards of each of the qualities - ranging from the highest to the lowest - and fixing attention exclusively on one quality whilst rating.

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10. Thomson, G.H. (1921). A Rating Scale for Teaching Ability in Students" Jour. Expt. Ped., Vol. VI, No.2, pp 75-82.
 11. Strong, E.K. (Editor) 1920. "The Army Personnel Manual". U.S.A.

Initially a greater weight was given to the last quality - the power of getting results, but this Thomson himself disliked, for as he puts it, "there are other things in the world that getting children to answer so many questions at the end of the lesson" (p. 78). Further, Thomson later felt that on the whole it was wiser not to attempt any numerical evaluation of each of the qualities and accordingly students were placed in the lowest, fourth, middle, second or highest fifth by comparison with known students of about the same age range. This leads naturally to A B C D E ratings in terms of binomial frequency 1,4,6,4,1, to avoid the awarding of too many A's and E's. But Thomson's scale was empirical. No data or analysis was given. He was offering a challenge, and, admitting that the problem of assessment of teaching ability in students (though not the only or the most important question of teacher training) was a definite, and at that time a somewhat confusing, question, he published his notes with a view to producing discussion and learning the opinions and practices of other colleges. In tracing Thomson's many investigations, the writer has found no evidence that he returned to the topic.

Nevertheless, an earlier preliminary inductive enquiry of a statistical nature into the qualities of merit in teachers was made in the previous decade in America by Ruediger and Strayer (12). They considered that the subject had been 'so little investigated, albeit so frequently discussed' and, like Thomson, they sought to stimulate research on methods of accurately determining a list of 'the fundamental qualities of merit in teachers', 'of finding the relative importance of these qualities', 'how they should be weighted in rating teachers for administrative recognition', 'how these qualities correlated among themselves'. None of these problems was adequately answered. However, an attempt was made by principals and supervisors to rank teachers on eleven traits after ranking the teachers in order of general merit as teachers. The 'halo' effect could have been appreciably large. It is of interest here to note the traits (12a.) selected (the correlation between the trait and the general teaching merit mark is given in brackets).

12. Ruediger, W.C., and Strayer, G.D. (1910). "The Qualities of Merit in Teachers". J.Ed.Psy. No.1. pp. 272-278.

12a. *ibid.* p. 275.

1. Keeping order (0.56)
2. Teaching skill (0.54)
3. Initiative (0.50)
4. Personality (0.46)
5. Studiousness (0.44)
6. Following suggestions (0.42)
7. Accord (0.38)
8. Experience (0.36)
9. Social Factor (0.28)
10. Appearance (0.20)
11. Health (0.04)

It appears that Thomson's invitation was first accepted in this country by Cattell (13) some ten years later. With a plea for objectivity Cattell collected written evidence from Directors of Education, Inspectors, Staffs of Training Colleges and University Departments, Head and Assistant Teachers of Elementary and Secondary Schools to ascertain "the ten most important traits of the good mature teacher, the ten most important qualities of the good young teacher and the qualities which normally distinguish the young male from the young female teacher". The 208 replies contained a great variety of descriptions used by the respondents over an immense range of qualities. These, however, Cattell sifted to a comprehensive list of twenty-two into which all the descriptions were classified 'with very little overlapping' (13a). Yet the nature of these replies indicates the difficulty to be expected in formulating a single concept of teaching ability and it is this difficulty which will impose certain limitations in later treatment. In the first place, while the various groups showed fair agreement, yet they tended to accentuate in certain directions.

13. Cattell, R.B. (1931). "The Assessment of Teaching Ability". B.J. Ed. Psy., Vol. I. No. 1, pp. 48-71.

13a. Ibid p. 50.

Thus Training College staffs stressed intelligence; Inspectors orderliness, open-minds and good presence; and teachers sympathy, tact and perseverance. Secondly it is interesting to notice in what outstanding way the demands on the young teacher differed from those of the mature teacher. The young teacher was required to show more 'Perseverance, Enthusiasm and Alertness of Mind' against a background of 'Social Fitness, Physical Health and Presence'. On the other hand, for the mature teacher 'Class-room Technique, Knowledge of Psychology and Pedagogy, Intelligence, Sympathy and Tact' were of greater concern. Further, Cattell made it clear that the order of importance of his twenty-two qualities depended not only upon the sex of the teacher but upon the sex of the assessor. From all his evidence Cattell put forward a Rating scale, with a 5-point numerical judgement on each of his 22 qualities. The final score for teaching ability was to be calculated from a weighted summation, the weights being derived from his statistical survey on the assumption that those first on a list were the first to come to mind and merited greater weights than those lower on the list which were probably "hunted up from the recesses of memory". (13a).

These qualities and their respective weights are given in table .1.

The qualities fall into four groups. The groups roughly range from those most innate and less susceptible to training to those which are acquired and are almost entirely matters of education.

13a. Ibid p.50.

Table 1 - Cattell's Rating Scale of Teaching Ability (13b)

Table of Weighted Qualities

Group	Quality	Weight
I	Natural Gifts	Intelligence 8.7
		Physical Health 8.1
II	Character and Temperament	Presence 8.1
		Self-Control 7.6
		Personality and Will 7.4
		Sense of Humour 6.9
		Kindliness 5.8
		Open Mindedness 5.4
		Tact 5.2
		Enthusiasm 4.4
		Perseverance 4.3
		III
Conservatism 3.8		
Alertness of Mind 3.3		
Orderliness 3.3		
Idealism 3.0		
Outside Interests 3.0		
IV	Matters of Education and Acquired Skill	Knowledge of Subject 2.8
		General Culture 2.7
		Social Fitness 2.0
		Knowledge of Psychology and Pedagogy 1.3
		Class Technique .3

The suggested lay-out of Cattell's Rating Scale of Teaching Ability took the form of a profile. The writer has been unable to trace any report of its use. It appears to have been stillborn.

Jenkinson (14), of the University of Manchester, has produced an experimental rating scale for teachers in training, which is described with respect to its content, as the present writer understands that no experimental data concerning its use is available. The object was to provide a convenient and clear method of assessing those skills which are of first-rate importance to teachers and are susceptible of improvement during a training course. Divided into two parts, each of six items, users of the scale were recommended that a short time (for example a day) be allowed to elapse between the ratings on the first and second part and in any event to aim at rating each item with no deliberate reference to the rating on the rest. The twelve items were: -

Part I

1. Interest in children
2. Ability to reorganise own knowledge and skill into forms comprehensible and valuable to children.
3. Vitality (as expressed in classroom behaviour and manifested in response from classes).
4. Participation in the social life of the school.
5. Resource in adapting instruction to varying grades of capacity in the same class.
6. Appreciation of the limits of children's powers of attention, and of the need to diversify lessons.

Part II

7. Capacity to perceive relations between educational theory and the practice of teaching.
8. Interest in the community to which the school belongs, and in the wider local, national and world community.
9. Willingness to teach subjects other than those specialised in (normally such teaching is at an elementary level).
10. Readiness to work with duller children as well as with average or brighter children.
11. Skill in using and directing children's desire to be active.
12. Mastery of the normal techniques of class teaching.

-
14. Jenkinson, A.J. (possibly 1945). "An Experimental Rating Scale for Teachers in Training".

Each of the above items contained adequate descriptive passages at three points on the scale, namely at poor, average and excellent to illustrate what, within the item, it was intended to rate.

Martin (1944) of America, in her efforts to discover the best success criteria in her data for prediction purposes in teacher education finally chose a college mean mark over a period of four years in preference to a superintendent's rating on sixteen qualities at the end of the first year of teaching in the field. The choice was justified on five grounds (15), all tending to aggravate the 'halo' effect rather than to minimise it. Hence, although the correlation coefficients between her various twenty-nine college variables and the superintendents' ratings were, in general, each some 0.5 lower than those between the same twenty-nine variables and the college four years' marks (15a), the validity of the superintendents' ratings is just as questionable as the validity of the college mark. Nevertheless the rating scale of teaching ability employed in this investigation is of interest to the present discussion. Personal qualities and professional equipment received equal weights in the total rating. The sixteen qualities and the correlation of each quality with the total rating obtained from 124 graduate student-teachers were: -

<u>I. Personal Qualities</u>	with total superintendent rating
1. Personal Impression	.72
2. Voice and Mechanics of Speech	.58
3. Use of English	.72
4. Cultural and Social Adequacy	.74
5. Ethical Standards	.52
6. Mental Habits	.85
7. Physical and Mental Health	.52
8. Special Abilities	.69
 <u>II. Professional Equipment</u>	
1. Comprehension of Objectives	.85
2. Knowing and Understanding the Pupil	.87
3. Adequacy and Utilization of Scholarship	.79

15. Martin, L.O. (1944). "The Prediction of Success for Students in Teacher Education". Bureau of Publications Teachers' College, Columbia University. p.41.

15a. *ibid.* Table XXIII p.40

4. Instructional Planning.	.77
5. Class Instruction	.82
6. Class-room Administration	.80
7. Pupil Achievement	.86
8. Professional Growth	.76

The correlation of .80 between professional qualities and total rating as compared with .70 between personal qualities and total rating seems to indicate that such qualities as 'knowing and understanding the pupil, pupil achievement, class-room administration, and class instruction' are most closely related to the average or total rating of a beginning teacher than are personal qualities. Unfortunately, however, each quality was itself not unique but rather a composite quality, which must have made the work of the raters somewhat less objective. For example, the rater was required to entertain 7 subsidiary qualities on personal impression alone, namely: -

- "a. Is pleasing in general appearance.
- b. Has good posture and carriage.
- c. Is mentally and emotionally well poised.
- d. Meets people easily and graciously.
- e. Is neat and clean in person and attire.
- f. Gives evidence of essential vigor.
- g. Appears genuine." (15b)

Even within these 7 subsidiary qualities there exist, in effect, 13 separate judgements if the one rating on personal impression is made seriously. Similar difficulties would occur in rating each quality listed on this rating scale, which contains 115 separate items ranged under the sixteen quality headings to be rated. Martin's refusal to use the data from the rating scale thus appears to be justified on grounds more conclusive than those advanced by Martin herself, yet this decision cannot imply that the college overall mark was a more valid assessment of teaching ability than the score derived from her rating scale.

These 5 studies, broadly speaking, may be taken as representing the prevailing view of teaching ability at each decade of the century. The various qualities to be looked for fall under 82 headings. The first three rating scales have much in common in such traits as health, personality, enthusiasm, appearance, orderliness and studiousness. Thomson emphasized the power to arouse enthusiasm together with the mechanics of teaching such as care in preparation, logical explanation and questioning and blackboard work.

15b. *ibid.* Appendix II. Folded Insert between pp. 100-101.

Martin's scale contains indirectly nearly all the qualities of the previous scales and introduces others. The pupil factor, that is, knowing and understanding the pupil, receives specific inclusion and, from the teacher angle, stress is placed on the adequacy and utilization of scholarship. Whereas Cattell was the first to include 'idealism' among the teacher qualities, Martin attempted a more practical objective by requiring in the teacher some comprehension of the objectives in teaching. Further, Cattell introduces 'Social Fitness', which Martin extends to 'Social and Cultural Adequacy'. Jenkinson's scale contains no quality which considers the teacher in isolation. In effect it still contains the same qualities, but they are now met in a functional capacity interpreted in terms of the human relationship between teacher and pupil.

c. Assessment of teacher ability by measurement of pupil change

Mention was made in Section IIa that Cattell had proposed that of the three planes on which teaching efficiency could be assessed, only that of the plane of results offers a true basis of measurement, but experimental work along these lines has contributed little to the solution of the problem of teacher assessment.

Indeed, the problem will be extremely difficult because any such technique must rest on individual pupil change within the group, and such pupil change, even if measurable, cannot be claimed or disclaimed by any one teacher or group of teachers, since the school is but one of the educative agencies operating. Attempts, however, have been made. Guy (16) in a study of the various factors which influence the use of the accomplishment quotient as a measure of teaching efficiency met one of these practical difficulties when evaluating and comparing the efficiency of teachers in a school system on a basis of the annual A.Q. change, and was forced to conclude that it was only possible "when teachers have begun the year with comparable groups, and when the differences found can claim high statistical reliability". (16a)

-
16. Coy, G.L. (1930). "A Study of Various Factors which Influence the Use of the Accomplishment Quotient as a Measure of Teaching Efficiency."
J. Ed. Res. 21 p. 29 - 42.

16a. *ibid.* p. 42

Matthews (17), in his Winconsin study, used as a criterion of teaching ability, the measurable changes produced in pupils. After subjecting to elaborate statistical techniques the results of a battery of eleven tests, the findings threw doubt upon the validity of teaching ability tests when pupil change is used as a measure of teaching ability. On the other hand, other attempts to measure mathematically the teaching ability by the change in I.Q. of pupils over a measured time period, have, it is claimed in America, met with a fair measure of success.

In 1934, Seyfart and Tyndal (2) attacked the problem of the assessment of teaching ability by endeavouring to measure the difference in the assessments of two teachers in terms of an increment and decrement in mental age of the pupil. Thus their study was directed at finding "the mean increment of mental age necessary in order that a student of the less able of two teachers may achieve on the same level as a corresponding student of the better teacher"(2a) They compared two teachers (A and Z), the best and the poorest of a staff of seven, each with 73 selected girl students of chronological age approximately 175 months. Their findings show a difference of teaching ability equivalent to about a quarter of a year in mental growth on the part of the students. Thus it may be interpreted that "teacher A is so much more capable than teacher Z that students of teacher A may be a quarter of a year retarded in mental age and yet perform as well as corresponding students of teacher Z."(2b). Care, however, must be emphasized in interpreting this result. Not only may such a difference be more important at certain ages than at others; and in certain subject fields more important than in others; but differences in performances of pupils are not controlled solely by differences in mental age. Specific abilities, factors of temperament and personality will enter into all measures of differences in pupil attainments. Further difficulties have been suggested earlier by Terman (18) when he affirms "there is reason to doubt whether the differences between the very best and the very poorest teachers of a school system are half or even a quarter as important in determining the accomplishment of the pupils as are the differences in endowment as revealed by mental tests".

2. Seyfart, W.C. and Tyndal, B.S. (1934) "An Evaluation of Differences in Teaching Ability". J.Ed.Res. Vol.XXVIII No. 1

2a. *ibid.* p. 10

2b. *ibid.* p. 15

18. Terman, L.M. (1924). "Possibilities and Limitations of Training". J.Ed.Res., Vol. X, p. 338

d. Opinions from students of qualities related to teaching success

In order more fully to study the problem of what is meant by teaching ability we may take due regard of what has been said and written by pupils and students of their teacher's ability to teach them. Possibly many teachers have sought, directly or indirectly, the pupil's angle on their work. Many research workers have conducted investigations in this direction. Nevertheless some hesitancy in accepting the replies from pupils as offering sound criteria must arise, because such replies will reflect immature judgments and mentioned desirable traits will undoubtedly err on the side of popularity in relationships. However, those being taught certainly appear to require qualities partly in keeping with those sought in other approaches.

One of the earliest attempts to find out what pupils best liked in their teacher occurred at the end of the last century. By inviting 2411 boys and girls in grades I - VIII inclusively to write descriptions of the best teacher they had ever had (without naming the teacher), Kratz (19) decided on the following order of preference of teacher traits from the pupil's angle: -

1. Kindness
2. Patience
3. Politeness
4. Neatness
5. Discipline

In America, Book (20) in 1905 deduced from 1067 written compositions on High School Education which included a "discussion of their teachers", that the traits of teaching ability most appreciated by High School pupils are included in such terms as "sympathy and kindness, good humour, patience, sociability, firmness and courtesy - in short, the most fundamental virtues".

A decade later a wider picture of what pupils think to be best in their teachers was provided by Bird (21)

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19. Kratz, H.E. (1896). "Characteristics of the best teachers as recognized by children". Fed.Sum., Vol. III. p.413.
 20. Book, W.F. (1905). "The High School Teacher from the Pupil's Point of View". - Pedagogical Summary, September.
 21. Bird, G.E. (1917). "Pupil's Estimates of Teachers". J.Ed.Psy., Vol. VIII. pp. 35 - 40.

Giving no warning, Bird obtained written answers to the question "What are five or six best qualities of the best teachers you have ever had?" Her subjects were from 3 school groups - Normal School Students, Girls (150), High School Boys (253) and High School Girls (139). The order of preference (rearranged table, 21, p.40) of the ten most frequently mentioned teacher traits was respectively: -

<u>Quality</u>	<u>Grp. I</u>	<u>Grp. II</u>	<u>Grp. III</u>
Kindness	1	2	1
Fairness	2	1	5
Sociability	3	7	10
Sense of Humour	4	5	4
Good Temper	5	6	8
Discipline	6	3	2
Neatness	7	10	7
Patience	8	4	3
Preparation	9	8	9
Clearness of Explanation	10	9	6

There is a remarkable degree of agreement between these three orders (the coefficient of correlation between the first and second order is + 0.88, between the second and third order + 0.80.) indicating that as far as the subjects of Bird's research were concerned, there was but little difference between the two sexes or between 2 age-groups of girls in their evaluation of desirable teacher traits.

In 1931, Butsch (22) summed up the work of twelve previous investigators in America, who, during the 3 previous decades had obtained the opinions of pupils (elementary, high-school, high-school seniors and college students) on desirable teacher traits. On the assumption that frequency of mention could be interpreted as indicating an order of preference, Butsch (22a) placed the following twenty-four qualities of teacher in order of relative importance.

22. Butsch, R.L.C. (1931). "Teacher Rating". Rev. Ed. Res. Vol. I, No. 2, April, pp. 99-107.

22a. *ibid.* p. 99

Included in 7 studies	-	fairness
" " 6 "	-	kindness, instructional skill
" " 5 "	-	good-natured and pleasant, good disciplinarian, knowledge of subject matter.
" " 4 "	-	sense of humour, patient.
" " 3 "	-	personal appearance, inspiring, sociability, interest in work, personality.
" " 2 "	-	strong character, sympathetic, ability to interest
" " 1 study	-	politeness, neatness, serious and dignified, interest in pupils, broad educational interest, efficiency in use of class time, intelligent, broad-minded.

However, other than the work of Robinson (23) in 1924 and Hanthorn (24) in 1930, the number of pupils or students from whom opinions were obtained was less than a thousand in each of the twelve studies which Butsch reviewed.

To meet the criticism of small sampling judgements, other workers in America have, in several instances, secured a large number of pupils from which to draw inclusions. The most notable are Davis and Hart. Davis (25) secured the judgements of over 13,000 high-school pupils on the elements of strength in their teachers and of over 9000 pupils on elements of weakness. Hart (26), however, in the same year, completed one of the most elaborate studies in this field, by obtaining the reactions of nearly five thousand senior pupils in sixty-six widely distributed high schools to qualities of teachers with whom they had worked.

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23. Robinson, W.M. (1924). "Teachers as the Pupils See Them" *School Life*. 10,42, November.
 24. Hanthorn, A. (1930). "My Best Teacher". *American Childhood*. No. 15. p. 5-6, 60-61.
 25. Davis, H.M. (1924). "The Use of State High School Examinations as an Instrument for Judging the Work of Teachers". *Contributions to Education*, No. 611.
 26. Hart, J.W., compiler (1934). "Teachers and Teachings". *Macmillan Co. New York.*, 285 pp.

The characteristics with the highest frequency of mention were: -

1. instructional skill
2. good naturedness
3. interest in pupils
4. ability to make work interesting
5. good disciplinarian
6. impartiality
7. lack of crossness or sarcasm.

Although there may be danger in interpreting the views of pupils and students on desirable teacher traits, yet numerous investigations along these lines continued in America during the next few years. From his review of some five hundred of minor researches on allied subjects in the 1934-1937 period, Torgerson (27) affirmed there had been substantial agreement in the reports that students liked those teachers best who could teach effectively and who were kind, sympathetic, understanding and fair. If we accept the findings of Boardman (28) in the previous decade that there exists a high relationship between these teacher traits and teaching success, then any attempt at assessing teaching ability must take into full account the appeal of the teacher to the pupil in the expression of a fulness of the pupil-teacher relationship in the classroom.

One of the most important of these studies reviewed by Torgerson was conducted by Engelhart and Tucker (29). Their technique was to make arrangements whereby a group of expert judges prepared a list of fifty traits which they considered were related to good teaching and more than 200 High School students rated their teachers, using this list. Tetrachloric coefficients of correlation were computed.

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27. Torgerson, T.L. (1937) "The Measurement and Prediction of Teaching Ability".
Rev. Ed. Res., Vol. VII, No. 3, pp.242-5.
 28. Boardman, C.W. (1928). "Professional Tests as Measures of Teaching Efficiency in High Schools." Contributions to Education. No. 327. New York.
Teacher College, Columbia University, 85 pp.
 29. Engelhart, M.D. and Tucker, L.R. (1936). "Traits Related to Good and Poor Teachers." School Review, No. 4, pp. 28-33.

The ten traits (29a) showing the highest relationship to teaching success were: -

1. good judgment,
2. clearness in explanation,
3. respecting the opinion of others,
4. sincerity,
5. impartiality,
6. firmness,
7. appreciation,
8. interests in pupils,
9. broadmindedness,
10. knowledge of subject.

Further information of the qualities of teachers when received from the pupils' angle is provided by Eells (30). His most recent investigation covers many aspects of the total setting of American Secondary Schools. Employing the Hollerith sorting technique, and using the principle of frequency of mention to determine relative importance, he concludes that an 'interest in pupils' has a greater class value than other qualities. The following list gives his "class values" of the 16 best-liked teacher traits.

<u>Trait</u>	<u>Class Value</u>
Interest in pupils	5
Fairness	4
Helpfulness	4
Friendliness	4
Co-operativeness (with pupils)	4
Broadmindedness	4
Insight and Understanding	4
Courtesy	4
Efficiency	4
Preparation	4
Youth of the Teacher	3
Pleasantness	3
Reasonableness	3
Patience	3
Strictness	2
Informality	2

There is here a considerable overlapping of teacher qualities, many of which are contained in the first mentioned namely, an 'interest in pupils'. On the other hand, it is

29a. *ibid.* p. 244

30. Eells, K.W. (1938). "A Scale for Evaluation of Pupils' Judgments of Best-liked and Least-liked Aspects of Secondary Schools." *J.Ed. Res.*, Vol. XXXI, No.5, p. 328

clear that the pupils of Eells' investigation were also concerned with the need for efficiency from the teacher in the class-room and a wise awareness that teaching activities need preparation.

All of the studies reported in this selection shew the importance of teacher appeal to the student or pupil on personal qualities. The general issue of accessibility, fairness and understanding emerges and confirms the suggestion of Armstrong and others (31) that students will rate personal qualities higher than teaching ability which rates higher than scholarship, research and reputation.

Nevertheless in weighing the evidence reviewed in this section, we must note that these opinions came from pupils in full-time education in America. Although they are not without value it does not follow that similar results would be obtained from pupils in full-time education in this country, or from students taught by teachers in the field covered by the present investigation.

Indeed, it is the writer's experience that adults and adolescents seeking commercial or technical knowledge and skill usually know what they want and whether they are getting it. They are partly concerned with teacher appeal, but especially, in part-time technical and commercial education, they are more concerned with the teacher's ability to teach, that is, that the teacher must show that he (or she) is not only a craftsman in a particular skill, but also skilled in the craftsmanship of teaching. Schools and Colleges frequently build up a reputation for a subject or groups of subject which are well taught and many of the qualities emphasized in this section are of little concern to a student when he decides where to take a course of study.

It is of interest in this review of the opinions of pupils on their teachers to consider those qualities which students following teacher-training courses consider to be important aspects of the successful teacher. There is always the danger that a potential teacher will adapt his own gifts as a teacher to the modes and techniques by which he himself was taught. But, even if we view the evidence afforded by investigations in the light that a 'conservatism' in teaching skills tends to be carried over from generation to generation, we find that the older student desires to see in good teachers much that is in keeping with the views expressed by other, though younger, students.

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31. Armstrong, G., Beall, H., and Wissink, G.M. (1944)
 "Criteria for Ranking the Faculty of a Teachers' College"
 Peabody Journal of Education. Vol. 21, No.6. May.p.200

At the student teacher-training level, two researches at least are known to have been made in the years just before the last world war. Hildreth (32) asked students following a teacher-training course, to list the important knowledges, skills and techniques which their experiences of being taught showed that they needed. Omitting those which essentially are linked with the professional side of a teacher-training course and may be deemed informative issues, the twelve most important issues advanced were: -

1. mastery of teaching matter,
2. ability to teach children, not subjects,
3. ability to construct lesson plans,
4. ability to gain and hold pupil's interests,
5. knowledge of achievement testing,
6. knowledge of children in the classroom,
7. knowledge of child psychology,
8. a large cultural background
9. ability to cope with individual differences,
10. ability to be "a teacher, not a boss".

A second attempt to discover student-teacher opinions of good teachers was made about the same time by Copper (33). Through the data derived from a questionnaire submitted to his College students Copper affirmed "arousing interest on the part of the learner" as the essential of good teaching. This opinion, he found, was supported by 'descriptions of five great teachers of the ages' (34).

e. Studies of Failure among Teachers

Further light may be thrown upon our problem by looking at causes of failure in teaching. Bird (21) has already drawn attention to the work of Littler, Moses and Buellesfield along these lines in America.

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32. Hildreth, G.W. (1938). "Co-operative Project in Teacher-Training Supervision". Educational Administration and Supervision, Vol. 24, pp. 389-391
 33. Copper, F.R. (1938). "What is Good Teaching?" Education, No. 56, pp. 567-569
 34. Quoted by Broening, A.M. (1939). "General Methods of Teaching". Rev. Ed. Res. Vol. IX, No. 3, p. 296
 21. Bird, G.E. (1917). "Pupils' Estimates of Teachers". J. Ed. Psy. Vol. VIII. p. 35.

Littler (35) found that the major reasons for the failure of teachers were:-

- "a. poor discipline,
- b. weak personality,
- c. lack of teaching skill,
- d. lack of interest,
- e. laziness,
- f. failure to co-operate,
- g. poor health."

In the same year Moses (36) found that among twenty-six school systems, the ten most frequent causes of failure were: -

- "a. poor instruction,
- b. weakness of personality,
- c. lack of interest,
- d. weakness in discipline,
- e. lack of sympathy,
- f. inability of co-operate,
- g. unprofessional attitude,
- h. weakness of subject matter,
- i. disloyalty,
- j. immorality,
- k. poor health."

The parts that weakness in discipline and poor instructional skill play in causing failure among teachers received further support from Buellesfield (37) who, investigating the same subject, concluded that the chief reasons for lack of teaching success were: -

- "a. weakness of discipline,
- b. lack of judgment,
- c. deficient scholarship,
- d. poor methods of instruction."

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- 35. Sherman Littler (1914). "Causes of Failure Among Elementary School Teachers". School and Home Education. March.
 - 36. Moses (1914). School and Education.
 - 37. Buellesfield (1915). "Causes of Failure Among Teachers". Educational Administration and Supervision. September.

In the following decade, Barr (38) studied intensively the teaching performances of 47 good and 47 poor teachers of the social studies as decided from the composite ratings of three or more supervisors. The list of weaknesses shown by the poor teachers is a long one. The following summary (38a) gives the most important and distinguishing characteristics of the poor teachers with the frequency of mention within the group: -

- | | |
|---|------|
| a. makes no provision for individual differences | (46) |
| b. appraises the pupils' responses but pos\$es few commentarial remarks of value. | (44) |
| c. makes little effort to socialise class discussions | (43) |
| d. offers formal textbook teaching | (40) |
| e. is incapable of stimula ting interest | (37) |
| f. organises assignments and subject matter on text-book basis. | (34) |
| g. has poor discipline | (17) |

From studies from investigators in this country, we learn that Philips (39) has asserted that the younger non-graduate teachers commence teaching at too early an age, undoubtedly while many are still engaged with the problems of late adolescence. Hoppock (40) found that those teachers who were happy in their work had better human relationships and suffered less from emotional maladjustments than unhappy ones. Accordingly, his investigation shewed that ill-adapted emotional students were prone to be bad teachers. Daldy (41) in her investigation into the part played by adaptability in a group of domestic science students and by comparison with qualities related to teaching ability, such as ability to keep discipline and to maintain interest, found that those students who were ill-adapted emotionally showed a strong tendency to be bad teachers and further that the maladjusted students tended to come from unhappy homes.

38. Barr, A.S. (1929). "Characteristic Differences in the Teaching Performance of Good and Poor Teachers of the Social Studies." Public School. 127 pp.

38a. *ibid* p. 116

39. Philips, M. (1932). "Some Problems of Adjustment in the Early Years of a Teacher's Life". B.J.Ed.Psy.

40. Hoppock, R. (1935). "Comparisons of Satisfied and Dissatisfied Teachers". Ps. Bull.

41. Daldy, D.M. (1937). "Adaptability in a Group of Teachers." J. Ed. Psy., Vol. 7 p.1.

One of the most reliable of the studies related to failure among teachers, it is advanced, is due to Dodd (42). Dodd reported the opinions of sixty principals who kept a written record over a period of three years of the chief factors which were conducive to poor teaching.

The fourteen most influential, with their frequency of mention, as reported by Dodd were: -

1.	Inadequate previous preparation	60
2.	Lack of interest in child and job	37
3.	Poor health	31
4.	Lack of knowledge	25
5.	Laziness	14
6.	Lack of technique, poor methods	13
7.	Lack of patience	11
8.	Weak personality	10
9.	Lack of attention to individual	9
10.	Inability to ask challenging questions	8
11.	Quarrelsome as a teacher	7
12.	Lack of enthusiasm	6
13.	Dislike for children	6
14.	Lack of self-confidence	5

Approximately ten years later Turner (57) found that students in South Australia could be rejected either during the pre-college or college training periods on the following grounds: -

1. Inaptitude for teaching
2. Unsatisfactory conduct or character
3. Physical or mental unfitness
4. Poor scholarship

Vernon (43) at about the same time, was more emphatic. He suggested that emotional upsets in our young teachers were the main cause of failure and especially, of inability to keep discipline.

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42. Dodd, M.R. (1933). "A Study of Teaching Aptitude". J. Ed. Res., Vol. XXVI. No. 7
57. Turner, I.S. (1942). "The Training of Teachers in Australia". Australian Council for Educational Research, Melbourne University Press, p. 96.
43. Vernon, M.D. (1941). "The Relationship of Occupation to Personality." E.J.Ed.Psy.

f. Studies of successes among teachers.

A further attack upon the problem of the qualities of teaching success is to study a group of good teachers. Reference has already been made in the previous section to Barr's study of a group of poor teachers. Reports, however, were made at the same time on 47 good teachers of the social sciences and the distinguishing characteristics of each teacher recorded. It is of great interest to see the frequency of report of those qualities occurring most. Barr (3) gives us a long list. She finds that a good teacher (of the social sciences):

- a. motivates her work (47)
- b. has good discipline (47)
- c. stands throughout the greater part of the class period. (47)
- d. attends carefully to pupil responses (46)
- e. makes frequent use of illustrative material (36)
- f. shows superior knowledge of subject matter (35)
- g. is patient (32)
- h. smiles appreciatively (32)
- i. follows a topical organisation of subject matter (32)
- j. laughs with the class from time to time (31)
- k. requires notebooks and outside reading (31)
- l. is enthusiastic (28)
- m. has a well-established testing procedure (28)
- n. conducts class discussion in a conversational manner (25)
- o. makes frequent use of pupil's experiences (24)
- p. is pleasant (22)
- c. possesses a wealth of commentary expressions (22)
- r. asks many thought questions using a good technique (21)
- s. makes some provision for individual differences (19)
- t. socialises class discussions (16)
- u. provides definite direction for study. (11)
- v. possesses a good sense of humour (10)

Barr (5) considers that other studies reveal similar general pictures of the good teacher. However, while the qualities, in general, have much in common, there is marked difference in the degree of importance, if frequency of mention is taken to indicate the order of importance.

3. *ibid.* p. 115

5. *ibid.* p. 1279

Dodd's study (42) of successful teachers supports this view. Dodd's list of factors, as gathered from the observation of sixty principals over a period of three years, with their frequency of mention was: -

- a. daily class-room plans and preparation (30)
- b. recognition of individual needs of pupils (30)
- c. energy and enthusiasm (25)
- d. good health (25)
- e. sympathetic understanding of pupils (23)
- f. industry (17)
- g. knowledge of subjects taught (16)
- h. patience (15)
- i. pleasing personality (15)
- j. ability to ask challenging questions (15)
- k. ability to create independent initiative and thinking among the pupils (14)
- l. ability to hold interest of pupils (12)
- m. ability to win confidence and respect of pupil-personality (12)
- n. tact (11)
- o. desire to grow professionally (11)
- p. attractive personal appearance (11)
- q. use of good refined common sense (10)
- r. poise (10)

The most striking difference between the two lists is the position occupying by the teacher quality of meeting individual differences in the pupils. In Barr's list, it ranks very low and in Dodd's list, it merits the second place of importance. The raters in Dodd's study place enthusiasm much higher than does Barr. Yet such qualities as the command over subject matter and good powers of questioning hold approximately equal positions.

Vernon (43) considers that the more successful teachers are those who have had experience in disturbances of an emotional nature, but have been able to deal with them successfully. To Vernon, the opportunity to know frustration and inner conflict and to ride through difficult personal situations, are experiences which enable the more mature student to be 'en rapport' in harmonious pupil-teacher relationship.

Champ (44) in her study of why women leave the teaching profession implies a similar opinion. She confirms that an 'unsuitable' first appointment may be very damaging in that frustration and may be too powerful to be overcome.

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43. Vernon, H.D. (1941). "The Relationship of Occupation to Personality". B.J.Ed.Psy.
 44. Champ, J.M. (1948). "Why Women Leave Teaching". Results of an Investigation. The Times Educational Supplement No. 1760.. p.51.

It became apparent from her studies "that if a young student is to become a happy and successful teacher, she must possess positive characteristics of personality, intelligence and health", but "must find her first post in a place where her idealism is not shattered or her personal life emasculated by lack of encouragement and scope for activity" (a)

g. Resignations from the teaching profession

Whilst statistical returns from administrative sources in England and Wales reveal that resignations from the teaching profession are not numerous, very few research workers appear to have investigated the causes of such resignations. Recently in England, Champ (44a) provides an analysis which shows that young women teachers do not apparently leave the profession because they are dissatisfied with the pay, working conditions and chances of professional advancement but rather because they do not fit into teaching. Champ's findings throw positive light on the problem of what constitutes teaching ability by indicating the weaknesses in those who have discovered through actual experiences in teaching, that the role of teacher is not theirs. Using an attitude scale towards teaching as a career which "satisfied the requirements for reliability and validity" and supporting her results with a series of 13 case-studies in which widely different types of women were described, Champ showed that the most important reasons for withdrawal are personal, particularly the difficulty of maintaining discipline in the first few years at school, and of forming good relationships with colleagues, especially senior members of the staff. It would appear that teaching ability revolves around those traits of character and personality which, through "twenty years" will ride the storm of the worrying feeling of personal frustration at the limited scope for exercise of professional initiative and social ambitions which at the same time developing a greater interest in the children being taught and the process of education and a lesser interest in the self. Weakness in discipline was given nearly as often as marriage by former teachers as the reason for leaving the profession.

(a) It will be interesting to weigh the outcome of the two-year Further-Study Programme under the Emergency Training Scheme, which, being supervised by the local authority (in many areas) under the Ministry of Education Memorandum should do much to minimise the misfits in first appointments.

h. Self-assessment rating-scales of teaching ability

Although the reliability of a self-assessment rating-scale of teaching ability may be questioned on the grounds that there may be a natural tendency on the part of the rater to overrate or underrate himself or to ignore certain qualities altogether, yet the use of such a scale probably makes the teacher think about his success or failure when teaching, in an objective way. A few self-evaluation scales have been compiled (45,46,47) in recent years and it is of interest to examine these to see what contributions they make to the content of the assessment of teaching ability.

Sherman's scale contains 15 item qualities (47a) rated on a three-point scale with descriptive aids to each point. The chosen qualities can conveniently be interpreted as: -

1. Content value
2. Extent to which students respond
3. Sufficiency of homework
4. Class control
5. Personal appearance
6. Teacher-student relationship
7. Explanatory powers
8. Interest appeal
9. Distribution of class work over a course
10. Fairness in student assessment
11. Level of presentation
12. Suitability of content to daily business job.
13. Value of course as a whole
14. An overall mark
15. Estimate of mannerisms

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45. Goldstein, E.H. (1944). "A Self-Rating Check List and Scale for Commercial Teachers". The Balance Sheet, December, pp 162-164.
 46. Gregg, E.L. (1946). "As Others See Us". The Business Education World. April, pp. 407-409
 47. Sherman, M.A. (1947). "The Business Education World" June. pp. 562-572
 - 47a. *ibid.* p.564

Within the field of technical and commercial education, the teaching of a skill or aspect of a craft often demands the expression of teaching ability through the technique of demonstration. A useful self checking sheet of this nature offered by Averill (48) in 1941, arose directly from instructional trade training centres in the American Services. The scale is divided into 5 parts and each part scored separately. Briefly each part sought to assess:

1. Teacher's preparation

Is subject useful and understandable? Does conduct of lesson reflect preparation? Are tools, material, equipment, etc., ready for use? .

2. Preparation of learner

Is interest aroused? a feeling of need created? Are learners made 'ready'?

3. Presentation of new ideas

a. Is interest maintained? Technique of introduction appropriate? Is learner's understanding of the new ideas checked?

b. Is the demonstration good? Do the learners participate?

4. Application of the new skill

Is the task or job well chosen? Can each learner start easily and continue? Does the teacher check the learner's performance pattern adequately? Is a high standard of quality set up?

5. What the learners actually learned from the instruction.

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48. Averill, F.E. (1941). "Supervisors in their Training of Industrial Instructors". United States Office of Education. Washington, D.C. July, p.75.

More recently, Panton (49), in requesting teachers to be more self-critical of their teaching, puts forward the following as quite useful points for the teacher to view the success of any particular lesson: -

- a. Did the lesson fit into the scheme for the course as it was planned, or was it unduly isolated?
- b. Was the aim of the lesson definitely attained?
- c. What did the children actually learn?
- d. Were any parts of the lesson a failure?
(e.g. "unsuitable material, poor knowledge on teacher's part, unsuitable method, disciplinary failure,....")
- e. If any part of the lesson was an outstanding success what were the contributing factors?
- f. Was the pupil-activity well maintained?
- g. Was the questioning effective?
- h. What adaptations were there to the original lesson plan?
- i. If the lesson had to be given again what changes should be made in the plan?

i. Pre-Service Selection of Teachers

According to Symonds (50), the selection of teachers remains one of the most unyielding problems which education has to face. A real practical problem, it continues to be immune in large part to assistance from scientific method, and today we are not much further ahead in a practical sense than we were several decades ago, notwithstanding persistent efforts on the part of investigators to advance knowledge concerning the characteristics which make for success in this work. No doubt, the over-supply of legally qualified teachers and the under-supply of competent teachers, has, in the past, rested partially on pre-training selection. Symonds, however, is concerned solely with the American field.

considers
Symonds

Considerations of the qualities of a candidate looked for in selection methods should throw light on the problem of the assessment of teaching ability. In 1928 Linton (51)

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49. Panton, J.H. (1947). "Modern Teaching Practice and Techniques". London. pp. 289-290
 50. Symonds, P.M. (1946). "Evaluation of Teacher Personality" Teachers College Record. p.21.
 51. Linton, C. (1928). "A Study of Some Problems Arising in the Admission of Students as Candidates for Professional Degrees in Education." Contributions to Education. No. 285. 163 pp.

proposed certain minimum requirements from students about to enter for courses leading to a professional degree in Education in America. These demanded evidence of: -

- a. adequacy of work completed at institutions previously attended,
- b. good moral character,
- c. physical fitness,
- d. intellectual fitness,
- e. personal qualities necessary for success in some field of service in education.

Linton further recommended that such evidence should be supported by evidence from 'a personal interview when feasible' and that psychological and intelligence examinations' should be conducted to aid 'in determining fitness' to teach.

In the same year, Suhrie (52) gave evidence of a typical plan of selective admission which had been used at the Rhode Island College of Education and which, we are told, was 'really succeeding in its purpose'. The desirable qualities, upon which final selection was to be made were: -

- a. academic standard,
- b. personal fitness to teach as shown by:
 - i. intellectual qualities,
 - ii. habits of work,
 - iii. personal and social characteristics,
 - iv. emotional characteristics
 - v. physical characteristics
 - vi. evidence of cultural training
 - vii. special abilities.

The list of qualities shows a marked lengthening in the next few years, for in 1934, Barr and Douglas (53) revealed the fifteen more important bases of methods used in the year 1932-1933, to select students for teacher-training courses in America. These, with their

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52. Suhrie, A.L. (1928). "Problems in Teacher Training". Proceedings of the 1926 Spring Conference Conducted by the Normal School and Teachers College Section of the New York Society for the Experimental Study of Education. Vol.I., 423 pp.
 53. Barr, A.S. and Douglas, L. (1934). "The Pre-Training Selection of Teachers." J.Ed. Res., October, p.92

frequency of mention were (53a): -

<u>Bases of Selection</u>	<u>Frequency</u>
Scholarship	33
Character (by testimonials)	25
Ability and Aptitude (by testimonials)	23
Health	21
English (by examinations)	20
Aptitude for teaching (by psychological test)	18
Personality	14
Personal qualities	14
General education (by examination)	14
Health (by examination)	11
Pledge to teach in State	7
Achievements (by tests)	3
General ability (by tests)	3
Speech defects (by examinations)	3
Musical Ability	2

In 1933, Troyer (54) of America pointed out that the desirable qualities of a teacher should be "at least commensurate with educational outcomes as hoped for in the expression of educational aims". Such qualifications, according to Troyer, would demand that teachers should be:

- a. healthy,
- b. socially competent,
- c. emotionally stable,
- d. intellectually capable,
- e. academically successful,
- f. civically responsible.

Of the many factors studied in America, Sanford (55) selects only four as being important. They are: -

1. intelligence
2. scholarship
3. personality
4. scores earned on professional information
and subject-matter tests.

even when acknowledging that the correlation between these four factors and teaching success is positive but low.

53a. *ibid*, p. 100

54. Troyer, M.E. (1933). "Selection of Students for the Profession of Teaching." *J.Ed.Res.*, No.33, p. 582.

55. Sanford, C.W. (1941). *Encyclopedia of Educational Research*. Teacher Education - V. Pre-service Selection, p. 1215.

The programme of selection admission in New York State (56) for the years 1936-1941, may be taken as an example of a definite technique indicating those qualities and attainments looked for in a candidate (in America) through which, it could be hoped, teacher ability could reasonably be expected. Briefly, it involved selection through considerations in: -

1. Age.
2. Basic education, i.e. specified high school registration in English, 2 main subjects and subsidiaries in social studies and general science.
3. Scholarship (a four-year high-school average of 72% or more).
4. Mental fitness (ratings plus tests in intelligence, English and reading).
5. Personal and social fitness (personal interview, confidential reports and inventory blanks).
6. Physical fitness (by medical examination)
7. Technical skill (where necessary by a performance examination).

In Australia, many types of students offer themselves for preparation as teachers in State Teachers' Colleges. We are informed "the actual process of selection..., however, is quite thorough (57)". But we find that, assuming good health in the candidates (all are required to undergo a medical examination), "the most important single qualification for admission to Australian teachers' college is that of academic qualifications as indicated by the quality of pass secured in one or other of the many public examinations which are held annually in the Australian states (57a)". In addition to a creditable pass in a School Leaving Certificate as the minimum academic qualifications for entrance, competence in subjects other than those taken in the certificate may be required according to the field in which the teacher proposes to teach.

56. From Encyclopedia of Educational Research, p. 1218 - Quoted from a typewritten report by Herman Cooper, Assistant Commissioner for Teacher Education, State Education Department of the University of the State of New York.

57. Turner, I.B. (1942). "The Training of Teachers in Australia." Australian Council for Educational Research, Melbourne University Press.

57a. *ibid.* p. 91.

It is not the general practice in Australian teachers' colleges to give any special tests - intelligence, personality, temperament - as aids to selection, though in some colleges such tests are given occasionally to all students soon after admission. In Western Australia, tests administered are: group intelligence test, emotional stability test, arithmetic, spelling and completion test; in addition, students prepare an illustration for a class lesson, they prepare and tell a story, give a description and tell a humorous story. "These exercises are used to detect and correct gross weakness which are likely to affect teaching, for example, speech, posture, facial expression, etc." (57b)

Thus in 1942, the technique of selection of teachers in Australia rested basically on good health and a sufficiency of academic knowledge, for although each candidate was interviewed by a panel (which in many states did not contain a representative of the teachers' colleges), it was of necessity short in duration and the most that could be done was to estimate the candidate's speech, his interests and hobbies, and one or more aspects of personal qualities (57c). In one state, Victoria a numerical mark was awarded at the interview, which, when added to similar marks awarded for academic qualifications, enabled an order of merit of the candidates to be prepared.

In a recent article, Sumption (58) attempts to reduce the number of important factors at the selection stage to six, namely: -

- a. personality
- b. education
- c. experience
- d. health
- e. age
- f. a written examination

Sumption's six factors, are, however, more than six in number for at the written examination it is proposed to include 'tests of reasoning, of English comprehension, of English expression, of general culture in science, literature and the social sciences, of professional information and contemporary affairs'.

57b. *ibid*, p. 95

57c. *ibid*, p. 96

58. Sumption, M.R. (1944). "Six Points to Consider in selecting Teachers." *Nations Schools*, No.33. p.41,42

All of the studies considered in this section emphasize both scholarship and 'personality'. Nevertheless the assessment of a 'teaching personality' or of those traits and qualities which constitute the 'teaching personality' is of major concern. It is important, therefore, and also convenient at this stage, to entertain some of the attempts to define more fully the concepts of the term 'teaching personality'. No doubt the effectiveness of a person as a teacher is related to his psychosexual personality, his tendencies towards aggression, his activity as contrasted with his passivity, his self-respect and emotional stability. Clinical studies would probably indicate that there is no one preferred personality for the effective teacher, but that many different kinds of personality can make valuable contributions to the educational development of boys and girls and young people. Indeed, it appears that if better teachers are to be employed in our schools, more attention must be paid to personality factors in selection. If there are different 'teaching personalities', it may be necessary, as well as more objective, to use techniques superior to the interview. Thus 'situations techniques', that is, actual class-room teaching may be more decisive at the selection stage in ascertaining whether a 'teaching personality' be present or absent. Such a situation may be interpreted as a stress situation of the Ansbacher, Murray and Stein type, and wisely interpreted could prove most revealing.

Even the 'discussion group' or 'shared-task' situation (as for example, in preparing an examination paper or marking a pile of scripts) would cause certain members to assume leadership and enable others to display those traits which dispose them to participate and contribute to successful team work. We may envisage that even role-playing or psychodrama, and projection techniques may eventually be used to aid selection or to identify patterns, if they exist, of the 'teaching personality'.

However, in the mean time, Symonds (50a) suggests that there must be some core of personality which plays its part in making some teachers successful and others unsuccessful in their work. In lieu of decisive studies in this field, he proposes that the following four personality-factors are essential in any individual who is to succeed as a teacher: -

1. Every teacher should like teaching and through it should attain personal goals and satisfactions.

2. A good teacher should have self-respect, dignity and courage as opposed to feelings of inferiority and inadequacy. The personally insecure teacher has difficulty with discipline, and either becomes inept and ineffective or must maintain status artificially.
3. A good teacher must be able to identify himself with his pupils. He must have social awareness, the capacity to enter into the feelings and interests of others, to understand the motives and conflicts of others. (a)
4. The competent teacher is emotionally stable. He is able to accept the aggression of boys and girls, and their laziness, carelessness, slowness and stupidity as well as their brightness, industry and efficiency. He is able to accept competition with his colleagues and the demands and restrictions imposed by the community. (b)

As far as this country is concerned, it is believed that, especially in the case of women teachers, 'the process and methods' of selection 'in use are the best that can be devised' (59). Evidence, such as is available, tends to confirm this. The percentage of failures in the qualifying examination is low (about 6% over the whole country) and 'there is reason to believe that very few of them either fail to have their certificates endorsed at the end, or give up teaching after a short period because of breakdown or failure to make good in the profession' (59a).

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- (a) Most of the characteristics described as pupils' opinions of good teachers in the studies surveyed in Section II d. came under this category. Also see the items on Part I of Jenkinson's scale (page 11).
 - (b) Items 8, 9 and 10 of Jenkinson's scale can be deemed to emerge from this category.
59. Dymes, D.M.E. and others (1948). "The Selection of Non-Graduate Students for Training College Courses." Association of Teachers in Colleges and Departments of Education. p.1.
- 59a. *ibid.* p.1.

Other than the admission of ex-service candidates under the Emergency Training Scheme, selection in England is spread over the four following stages: -

1. It begins at the age of 10 or 11, when allocation to the secondary school is made. During this stage, knowledge of desirability to teach and potential ability to teach become known to the staff.
2. Qualifying examination (School Certificate) or the stage of sitting for it. There are other qualifications, however, which are allowed to compensate for a poor certificate. These include ability in music, art or craft and drama, skill in games, athletics or physical education, and the holding of school offices.
3. Sixth Form work. This is considered more in terms of the opportunity it affords for responsibility and for learning to work independently than in gaining a Higher School Certificate.
4. An interview of those who have been selected in the preliminary sifting.

Clearly, 'examination qualifications are the first requisite' (suitably 'compensated' if necessary) yet great weight is given to the opinion of the Head Master or Head Mistress, since it is realised by the selectors (59b) that such an opinion is 'based on a knowledge of the pupil to which contribution has been made by a number of other people on the staff who have also had opportunities of observing the pupil and his abilities and qualities'.

j. Studies of the opinions of supervisors of student-teachers

Much has been written, especially in this country and America by educators and others on traits and qualities considered to be essential to good teaching. Many investigators, too, have collected the opinions of experts in educational administration.

The research work of Anderson (1917), King (1925), Davis (1929), Jordan (1929), Almy and Gorenson (1930) was first collectively reviewed by Butsch, (22a), in 1931. The most important traits which emerged from these five studies fall, when using frequency of mention as an indication of relative importance, into three groups.

1. Discipline,
teaching skill
personality
co-operation.
2. Scholarship
daily preparation
fairness.
3. Physical health and fitness,
intelligence
resourcefulness.

In 1929, Charters and Waples (60), as part of the Commonwealth Teacher Training Study, obtained an extensive list of teacher traits from a group of administrative teachers and others. This list contained many traits which, first reduced to 83 traits, was finally telescoped into 25. Of these, the six most important which applied to at least four out of the five types of teachers for whom such ratings were obtained turned out to be: -

1. Adaptability
2. Considerateness,
3. Enthusiasm,
4. Good judgement
5. Honesty,
6. Magnetism,
7. Self-control.

Within the next decade, two studies, one by Hildreth and one by Stanforth, throw further light on our problem. Hildreth (32a) asked supervisors to state what knowledges and potentialities student teachers should have before beginning a teacher-training course. Of the many listed, the twelve leading in importance were: -

- a. a real mastery of the subject taught,

22a. *ibid.* p. 99

60. Charters, W.W. and Waples, D. (1929). "The Commonwealth Teacher-Training Study". University of Chicago Press. pp. 14-19

32a. *ibid.* pp. 389-391

- b. an exemplary personal life,
- c. dependability in all relationships in every way,
- d. a working knowledge of child psychology,
- e. a course in special method
- f. a genuine love of children
- g. initiative originality,
- h. a working philosophy of education,
- i. training in voice control and public speaking,
- j. a real interest in teaching,
- k. realization of a need for planning,
- l. good taste in personal appearance.

Stanforth (61) put a similar question to that of Hildreth, by asking fifty supervisors to list the specific traits and abilities which they expected beginning teachers to bring into their work, but it differed considerably from Hildreth's question by enquiring for consideration of those traits and qualities effected as a result of a variety of a teacher-training course. Stanforth lists the fifteen more important items as: -

- a. broader vision of the possibilities of teaching,
- b. an enthusiasm for school work,
- c. initiative, resourcefulness and originality,
- d. an optimistic outlook towards teaching,
- e. a willingness to work and a knowledge of how to work with people,
- f. the habits of neatness, accuracy, fairness and firmness,
- g. cultured and refined manners accompanied by high moral sense,
- h. the habit of promptness,
- i. ability to analyse and discover own weak points,
- j. ability to control one's voice, posture, movements and mannerisms,
- k. a love for and patience with children,
- l. a knowledge of lesson plans,
- m. an understanding of school organisation and purposes for which school exists,
- n. ability to control and regulate the mechanics of a classroom,
- o. skill in marking and grading papers,

k. Studies involving the measurement of qualities associated with teaching success.

Many attempts have been made to determine the degree of association between scores on individual qualities and assessments of teaching ability. These have usually dealt with the problem of predicting success in teaching, either by the analysis of certain factors in the previous schooling of the teacher, or by the comparison of a student's success in certain tests with skill he later showed in teaching, or by rating of qualities believed to be strongly associated with teaching success. Apparently the first study was made by Meriam in 1906 (62). Since the publication of Meriam's findings, over seventy separate and composite qualities have been studied using correlation techniques. Indeed it has been stated (55a) that 'nearly every factor which it is thought may condition success in teaching has been studied, but the investigations have not provided a satisfactory answer.' This, no doubt, is due in a large measure to the lack of any valid and reliable criterion of instructional efficiency. In other words, the identification of qualities is not possible prior to the establishment of a criterion. Nevertheless, it must be agreed that all studies which seek to measure the degree of association between measures of individual qualities and measures of successful teaching ability, are tending to establish a criterion. We therefore turn to the findings of such studies.

Measures of age, years of experience, skill in handwriting, height, weight and in many instances, general intelligence, have tended to approach zero in their correlation with measures of teaching success. On the other hand, several relatively high correlations have been reported for measures of personality traits and measures of academic background.

Knight, (1922), Boardman (1928) and Odenweller (1936) reported correlation coefficients of 0.15, 0.29, 0.34 when age was studied with respect to measures of teaching ability in the field (4a).

62. Meriam, J.L. (1906). "Normal School Education and Efficiency in Teaching". Quoted by Sandiford (4) p.9

55a. *ibid.* p. 1215

4a. *ibid.* p. 20.

Very nearly zero values were obtained in studies comparing build and physique with teaching success. The work of Odenweller indicates - .02 for height-weight ratio, - .02 for weight, .08 for height and Whitney (1924) obtained .12 for general physique. (4b).

Many investigators have sought to measure the degree of educational or academic achievement at various points in a teacher's training to seek the extent to which it is related to teaching ability. Achievement at secondary school level, at professional subjects and at special method courses during teacher-training courses have all received considerable attention in this country and America. Sandiford reports correlation coefficients obtained by Somers (1923) of .77, by Whitney (1924) of .09, by Anderson (1931) of .12, by Breckenridge (1931) of .35 and by Odenweller (1936) of .08 when High School scholarship marks were compared with assessments of teacher efficiency in the field (4b). Similar studies using teaching marks made during student teaching courses yield values by Kriner (1933) of 0.33 and Bent (1937) of .21 (4b). General scholarship at the College or Normal School level yielded coefficients of .15 by Knight (1922), .04, .07 and .50 by Broom (1929), .60 and .72 by Somers (1933) and .46 by Bent (1937).

In this country, Pinsent (1933) (63) obtained .09 when correlating scores of academic ability with teaching ability. Turnbull's figure (64) obtained a year later was nearly zero, yet Panton (65) obtained .45. Using an interview technique, Skinner (1947) found a correlation

4b. quoted by Sandiford.

63. Pinsent, A. (1933). "Pre-college Teaching Experience and Other Factors in Teaching Success of University Students". B.J.Ed. Psy., Vol. III. No.3
64. Turnbull, G.H. (1934). "The Influence of Previous Teaching Experience on Results". B.J.Ed.Psy., Vol. IV, No.1
65. Panton, J.H. (1934). "The Assessment of Teaching Ability with special reference to men students in training." M.A. thesis lodged in the University of London Library.

coefficient of .56 between ratings on general educational background and assessments of teaching ability in educational and vocational training instructors following a course of teaching training in the Royal Air Force (6a).

Studies which have used measures of professional scholarship at Training College level and their correlation with assessments of teaching ability made either during the period of teaching practice or when teaching in the field may be summarised as follows: -

	<u>Investigator, year and correlation coefficient obtained</u>		
a. Principles of Education (various aspects) -	Meriam	(1906)	.34
	Knight	(1922)	.15
	Whitney	(1924)	.14
	Wagenhorst	(1930)	.01
	Ullman	(1931)	.30
	Bossing	(1931)	.19
	Broom	(1932)	.19 and .01
	Pinsent	(1933)	.35 (mean value)
	Panton	(1934)	.50 and .45
	Odenweller	(1936)	.21 (mean value)
	Bent	(1937)	.29 (mean value)
b. Special Method Courses.	Meriam	(1906)	.33
	Zant	(1928)	.28
	Panton	(1934)	.43

The figures of Pinsent and Panton, whose investigations were made in this country, are higher than those of workers in America. These differences may have arisen, wholly or in part, because their assessments of teaching ability were made during a student-teaching course whereas most of the assessments in the other studies were made with teachers in service. Lawton (66) in 1939 obtained a measure of academic ability by using the marks obtained by students (following a teacher-training course) at a written examination in three different years. The correlation coefficients derived when comparing these scores with a mean

6a. Skinner, W.A. (1947). op.cit. p. 58

66. Lawton, J.A. (1939). "A Study of Factors Useful in Choosing Candidates for the Teaching Profession." B. J. Ed. Psy.

teaching assessment given by three staff assessors were: -

1932	(N = 705)	r = .48
1936	(N = 528)	r = .45
1937	(N = 497)	r = .46

Most of the studies prior to Lawton's work related to small groups in the neighbourhood of a hundred subjects. Lawton's groups are seen to be quite large and his correlation values appreciably constant. Thus, although it does not follow by any means that a brilliant student will make a good teacher, yet it does appear that academic ability does have an appreciable contact with teaching success. It may be that general intelligence is at least a part cause of the extent of this contact.

However, nearly all the investigations which have compared general intelligence scores with assessments of teaching ability have yielded small correlation coefficients. The results of seventeen studies are: -

Knight	(1922)	.00	
Somers	(1923)	.54 and .43	
Cooper	(1924)	.22	
Whitney	(1924)	.03	
Pyle	(1927, 1928)	.15 and .03	
Morris	(1929)	.33	
Broom	(1929)	.30 and .14	
Cahoon	(1930)	.00	
Breckenbridge	(1931)	.09 and .07	
Neel and Mead	(1931)	.14	
Ullman	(1931)	.15	
Broom	(1932)	.16	
Pinsent	(1933)	.03 and .17	
Odenweller	(1936)	.00 and .04	
Bent	(1937)	.20 and .19	(a)
Skinner	(1947)	- .01	(6a)

These values, with the exception of those of Somers and Morris, are very small. A zero-order correlation coefficient is often difficult to interpret. A low coefficient has led some persons to state that the correlation, and hence the study was of little or no significance, whereas it might be quite significant if interpreted in the light of the elements operating in the data. All the subjects of the investigations mentioned in the previous paragraph had been accepted for teacher-training courses of one kind and another. The groups employed were highly selected, and although accurate information is lacking, it

(a) cited by Sandiford. Op. cit. p.25

(6a) Op. cit. p.56

is highly probable that nearly all these subjects were above the average in general intelligence. It follows that a full range of I.Q. from a representative sample of the population would almost certainly raise the correlations considerably.

Nevertheless, emphasis has been placed in recent years, on the investigation of those aspects of the teacher-pupil relationship which contribute to teaching success. This has led naturally, to correlation studies involving the personality of the teacher. Many studies have sought to judge the teacher's personality as a whole or to assess particular traits of personality such as assurance, initiative, integrity, forcefulness, adaptability, emotional stability and the like. Earlier studies suffered considerably from the halo effect, that is, the judges, when considering a certain teacher, were unable to consider each trait separately, but formed an opinion of the teacher as a whole, so that those whom they rated high in teaching effectiveness, they also tended to rate high in personality and personality traits. In the following account of the more important investigations into the degree of relationship between personality and teaching success, the possibility that the halo effect introduced a spurious element into the correlation is indicated by a footnote.

The main researches in the field under discussion involve ratings of the total personality by

1. Supervisors	(Ruediger and Strayer 1910)	.46	(a)
2. Normal school staff	(Somers - 1923)	.62	(b)
3. Morris Trait Index L	(Morris-1929)	.46	(b)
4. Almy-Sorensen Scale	(Neel and Mead-1931)	.69	(b)
5. Thurstone Personality Scale	(Watson-1932)	.09	
6. College Staff	(Panton-1934)	.45	(b)
7. Critic Teachers	(Odenweller-1936)	.25	
8. Training College Staff	(Odenweller-1936)	.27	
9. Teachers	(Odenweller-1936)	.53	(b)
10. Principals and Super- visors	(Odenweller-1936)	.83	(a) (b)
11. Hostel Tutors	(Lawton-1939)	.5	-.6 (b)
12. Tutors (by interview)	(Skinner-1947)	.47	
13. Fellow-students	(Skinner-1947)	.72	(b)
14. Morris Trait index L	(Skinner-1947)	.17	

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- (a) Halo effect between two ratings done by the same person.
 (b) Ratings of personality influenced by a knowledge of teaching efficiency.

Although it does not follow that the various assessors were rating the same concept of personality, yet, it is apparent that estimates of the total personality, when influenced by the halo effect, correlate at low positive values with assessments of teaching ability.

Many investigators have concerned themselves with particular traits of personality, character and speech. The following are typical findings, arranged in alphabetical order: -

1. Accord	(Ruediger and Strayer-1910)	.38
2. Accuracy of Reproduction of Designs	(Skinner-1947)	.35
3. Acquisitiveness	(Skinner-1947)	.12
4. Adaptability	(Skinner-1947)	.62
5. Alertness	(Panton-1934)	.27
6. Appearance	(Ruediger and Strayer-1910)	.20
	(Martin-1944)	.72
	(Skinner-1947)	.35
7. Ambition	(Panton-1934)	.32
8. Assertion	(Panton-1934)	.13
(Assertiveness)	(Skinner-1947)	.03
9. Assurance	(Skinner-1947)	.20
10. Care	(Panton-1934)	.34
11. Clothing (in 'appearance')	(Panton-1934)	.39
12. Co-operation	(Skinner-1947)	.36
13. Cultural Adequacy	(Martin-1944)	.74
14. Curiosity	(Panton-1934)	.17
15. Deportment	(Panton-1934)	.25
16. English-use of	(Martin-1944)	.72
17. Emotional Breadth	(Skinner-1947)	.03
18. Emotional Intensity	(Skinner-1947)	.12
19. Emotionality	(Panton-1934)	.23
20. Energy	(Skinner-1947)	.53
21. Enthusiasm	(Panton-1934)	.72
22. Ethical Standard	(Martin-1944)	.52
23. Expression (in 'appearance')	(Panton-1934)	.48
24. Fearlessness	(Panton-1934)	.03
25. Group Activities	(Lawton-1939)	.30 & .59
	(Skinner-1947)	.63
26. Health-physical and mental	(Ruediger and Strayer-1910)	.04
	(Martin-1944)	.52
27. Humour	(Panton-1934)	.38
28. Initiative	(Ruediger and Strayer-1910)	.04
	(Panton-1934)	.45
	(Skinner-1947)	.67
29. Interests	(Strong-1933)	.13
	(Lawton-1939)	.30
	(Skinner-1947)	.05

30. Integrity	(Skinner-1947)	.39
31. Leadership	(Barr and Douglas-1944)	.51
	(Panton-1934)	.45
	(Skinner-1947)	.17
32. Lessons in Education	(Dodd-1933)	.28
	(Skinner-1947)	.22
33. Orderliness (in discipline)	(Ruediger and Strayer)	.56
(in bearing)	(Panton-1934)	.87
34. Persistence	(Panton-1934)	.33
35. Presence	(Panton-1934)	.76
36. Professional Growth	(Martin-1944)	.76
37. Reading Comprehension	(Dodd-1933)	.19
	(Skinner-1947)	.10
38. Reproduction of Designs	(Skinner-1947)	.35
39. Responsibility	(Skinner-1947)	.52
40. Routine	(Panton-1934)	.05
41. Scholarship	(Knight-1922)	.60
	(Martin-1944)	.79
42. Self-Confidence	(Panton-1934)	.29
	(Skinner-1947)	.63
43. Sociability	(Panton-1934)	.32
44. Social Attitudes	(Skinner-1947)	.13
45. Social Feelings	(Skinner-1947)	.13
46. Speech	(Boyce-1912)	.63
-audibility	(Panton-1934)	.46
-aesthetic	(Panton-1934)	.36
-command	(Panton-1934)	.67
-pronunciation	(Panton-1934)	.19
	(Martin-1944)	.58
	(Skinner-1947)	.49 & .61
47. Speed of Reproduction of Designs	(Skinner-1947)	.22
48. Studiousness	(Ruediger and Strayer -1910)	.44
49. Sympathy and Tact	(Panton-1934)	.35
50. Understanding the Pupil	(Martin-1944)	.87

It is not suggested that the above list represents all the qualities that have been studied by correlation techniques. Attention, however, is drawn to the fairly consistent high values associated with speech, initiative, group activities, self-confidence and appearance on the one hand, and scholarship on the other, which have been investigated more than once. Other qualities, which also yield high correlation values may be of relative importance, but it appears necessary for many further investigations to be conducted to verify the results of previous workers before any final conclusion can be possible. Care also, must be exercised in the judgment of qualities which, hitherto, have yielded small correlation coefficients. It is quite possible that objective tests which in some of these

investigations have been devised to measure aspects of personality, fail completely to measure the quality which the test constructor has sought to measure (a). In fact, considerable doubt exists at the present time as to what, if anything, some of these tests do measure. Progress in the 'Observed Behaviour' technique will, it is to be hoped, lead to some clarification of personality and personality traits. Indeed, the measurement of static traits of the teacher personality by objective measurement may prove misleading. It seems to be more desirable and more important to measure traits of personality which find dynamic expression in some form of the teaching situation.

e. Studies of the opinions of educationists.

Within the previous paragraphs of this section, the writer has sought to indicate those qualities, which have led various investigators, using varied approaches, to associate with teaching ability. Clearly a great amount of research has been made in the last four decades with a view to determining the natural and acquired qualities which go to the make-up of the successful teacher. All of the works so far reported upon in this thesis have been at the research level, either in this or another country. Yet there remains further evidence to consider. Many educationists have seriously considered what teacher qualities lead to success and many have expressed, if somewhat cautiously in some cases and somewhat ideally in others, their conclusions. Some, such as inspectors and leaders in teacher-training courses, have reached their conclusions in consequence of many years in the direct observation of the performance of teachers in the class-room. Their opinions, resulting from a first-hand knowledge of teachers and their functioning power, demand serious consideration and appreciation. We shall therefore now turn to review what has been expressed by such educationists on desirable teacher qualities.

Bigelow (67) would affirm that general education is of fundamental importance in determining teaching ability. He believes in the desirability of finding a balanced attention to physical, social, aesthetic as well as intellectual needs in the teacher, that the teacher must show concern with attitudes, appreciations and ideals, as well as knowledge and skill, that the teacher must see relationships and achieve synthesis, and must realise functionality as the major criterion in planning instruction.

(a) Two such typical tests, in the opinion of the writer, are the Morris Trait Index - L Personality test and the Coxe-Orleans Prognosis Test of Teaching Ability.

67. Bigelow, K.W. (1939). Publication of the National Society for the Study of Education. Vol. XXXVIII, Part II, p.264

But above all that the teacher must possess the capacity to be self-directive. Objectively Bigelow would require in the teacher, after a course of training, evidence of a 'balanced general education' with emphasis on 'both the values of contemporary life and of the race experience', an indication of 'physical and mental health and of wholesome personality', an adequate facility 'in fundamental skills', a measure 'of scholarship and of such qualities as curiosity, industry and imagination', 'a respect for data, of the habit of generalization from data, and of skill in the solution of problems', an ability to promote those 'co-operative characteristics required for effective communal membership', a measure of 'skill in leading and in following', an 'ability to view change sympathetically, to understand contemporary modes of living and problems' and to show 'an integration of school and non-school experience'.

It has been maintained that teaching is an art with two distinct groups of elements. One group, the external elements of teaching skill, may be considered to be the simpler and which can be acquired by any teacher under suitable guidance. These are identified negatively by such common class room errors as 'repeating answers', 'limiting recitations to responsible members of the class', 'being satisfied with "concert" responses', 'calling on students before stating the question to be answered or the topic to be discussed', 'failing to speak distinctly, to write clearly', 'failing to establish a systematic and habitual method of caring for routine matters', 'failing to ensure the active effort of all members of the class'.

The elements of insight and resourceful form the second group. They are obviously more important than the external elements of skill, from which they differ in that they depend upon intelligent adaptation rather than upon habituated processes. Examples of such elements are 'aptness and readiness in illustration', 'clearness and lucidity in explanation and exposition', 'a keen sensitiveness to evidences of misunderstanding and misinterpretation upon the part of pupils and students', 'a dexterity and alertness in devising problems and framing questions that will focus the attention of the class upon just the right points', 'a sense of humour that will relieve tension or wearisome situations', 'the intellectual attitude that requires of itself a reasoned support of each point presented', 'a quickness to detect inattention and lack of aggressive effort upon the part of the pupils and students', and further 'a sense of proportion that ensures the emphasis of salient topics and distinguishes between the fundamental and the accessory'. It is to

these and similar qualities and abilities, that various writers ascribe an all-important role in successful teaching. They are the finer, less obvious factors in 'good form' in teaching, because they mean not only the possession of resources in the way of knowledge, not only an understanding of child nature or of the capacities and interests of adolescents, but also the readiness in summoning resources, initiative in adapting them to rapidly changing situations and a kind of 'rapprochment' with one class that strikes very much deeper than a mere understanding of its capacities and limitations. Thus to many educationists, successful teaching ability rests upon a foundation pattern of native talent.

Boardman (68) however, considers that the work of the teacher is of a three-fold character, and cites the following as suitable qualifications of a well-equipped teacher with respect to each of the three aspects.

1. Moral

- a. Patience, tact, kindness, cheerfulness and courtesy of manner.
- b. Sympathy with children, and fondness for teaching.
- c. Force of character: decision, firmness, and determination.
- d. Self-control; perfect command of temper.
- e. Moral worth; earnestness and uprightness of character.

2. Mental

- a. Thorough knowledge of his work in all its bearing.
- b. Ability to arouse interest, maintain attention, and keep order; keenness of observation and promptitude of action.
- c. Common-sense views about children, and the best methods of managing them.
- d. Good conversational and descriptive powers.
- e. Continual desire for extension of intellectual acquirements.

68. Boardman, J.H. "Practical School Method".
The Normal Press. London, p.7.

3. Physical

- a. Freedom from bodily deformity.
- b. Strong and healthy constitution.
- c. A considerable amount of bodily energy.
- d. Quickness of eye and ear, and good control over the voice.
- e. Some proficiency in national games is often desirable.

Although the field of technical and commercial education is generously covered with literature applicable to subject matter, it appears that, for various reasons (a), very little has been written specifically to aid the teacher in technical and commercial education to teach successfully. Creasey (69), writing specifically for this field in 1935, and basing his conclusions on his many years' experience as an inspector of the work in the technical colleges in England, concluded that the essential qualities of a successful teacher were: -

- i. knowledge of the subject and skill in the craft,
- ii. personality, i.e. 'appearance, voice, speech, manner', 'friendly and sympathetic'.
- iii. enthusiasm which leads to interest,
- iv. lucidity.
- v. knowledge and ability to associate the teaching with the daily experiences of the pupils,
- vi. ability to use questions,
- vii. a genuine interest in all kinds of students.

But again Creasey emphasizes that there is no one teaching personality. 'A personality that is attractive to one class may be unattractive to another'. Classes have been seen by Creasey 'in which the teacher carried the students with him by his vigour and vehemence', others in which the students have been attentive and industrious 'under a teacher whose characteristics were quietness and patience'.

(a) Undoubtedly one reason is due to the absence of 'qualified teacher status' in the field of Further Education and possibly a second reason was the complete absence of any professional training facilities for such teachers prior to 1946. It is to be hoped that the three new permanent Training Colleges for Technical Teachers, recently established at Bolton (in 1946), at London (in 1946) and at Huddersfield (in 1947) may provide opportunities to close this gap.

69. Creasey, C.H. (1935). "Technical Teaching in Theory and Practice." London. pp. 136-145.

One of the best statements in the literature on teacher qualifications is found in the McNair Report (70).

"Ideally every teacher should possess four qualifications, distinct but related, and the technical teacher requires a fifth. Happy the teacher who has:

(a) a general education which fits him to be a teaching member of an educational institution and makes him an acceptable colleague,

(b) a high standard of knowledge of his subject, or of skill in his craft,

(c) the ability to teach, that is the ability to build up in his pupils a systematic body of knowledge or to make them skilful in a craft, and to provoke them to study for themselves and lead them to respect sound learning and fine workmanship,

(d) an appreciation of the relation of his own subject to other realms of knowledge and of the relation of the institution which he serves to other educational institutions and to society at large.

In addition, the technical teacher must have:

(e) an intimate acquaintance with his subject in its industrial or commercial setting, if possible through the practical experience of having played a significant part in industry or commerce".

There is, within this extract, an attempt to define teaching ability. It is to be interpreted as the ability to build up in those taught a systematic body of knowledge or to make them skilful in a craft, and to provoke them to study for themselves, and lead them to respect sound learning and fine workmanship'. The recent report (71) of the Advisory Council on Education in Scotland emphasizes three essential elements needed in teachers, namely:

1. Personal Qualities
2. General Culture
3. Special Professional Preparation

70.(1944). "Teachers and Youth Leaders". H.M.S.O. London. p. 113, para. 406.

71.(1946). "Training of Teachers" - Scottish Education Department. Cmd. 6723. H.M.S.O.

Stress is placed on the educative process as a spiritual interaction between personalities, not merely as a matter of communication of information by a teacher to a pupil. In consequence the personality of the teacher is all-important, because the most subtle of the educative influences that flow from teacher to pupil have their source not so much in what the teacher knows as in what he is, what he values and what he enjoys. But continues the report "personal qualities essential in the good teacher ... fall into different categories with ill-defined borderlines. Some are unalterable parts of the original endowment while others cannot be appreciably modified in a course of training....." It is argued that of the qualities vital to the modern teacher, part are attributes of a general character like 'self-confidence, adaptability, initiative, sense of special responsibility' (71a) while others are more specifically educational - ideals and aims, 'which, in the end, manifest themselves in behaviour as mental sets and attitudes'. 'Thus every modern teacher, for example, should have the attitude of striving to make educative activities purposeful, to relate them to the learners' interests and problems. He should realise that education is best carried on in an atmosphere of love and happiness; he should have an abiding sense of the constant need for the restraint in the impact of his personality on the sensitive nature of childhood, he should have and retain a spirit of educational adventure; he should go out into the schools with a burning desire to do his best for each individual pupil.' But 'above all, he should have a glow of enthusiasm that will not be chilled to apathy by the experiences of his early teaching years" (71b).

Ratcliff (72) has suggested that although the type of teaching which is successful with children is not the same as the type of teaching successful with adults yet the qualities have much in common (72a). Of these qualities

71a. *ibid.* p.15, para 17.

71b. *ibid.* p.15, para.17.

72. Ratcliff, A.J.J. (1945). "The Adult Class - and Outline of Teaching Practice".
Nelson & Sons. London, 172 pp.

72a. *ibid.* pp.26 and 27.

but with obvious application to the adult class tutor, Ratcliff emphasizes: -

- a. high standard of academic knowledge and professional craftsmanship,
- b. the ability to respond through sensitivity to the class,
- c. leadership and candour (i.e. fair mindedness, integrating sense, charity, sincerity and modesty).
- d. the ability and knowledge to deal effectively with questions,
- f. tact in handling students.

Panton (73) whilst bearing in mind the general conclusion that it is very doubtful whether there is such a thing as the "teaching type" of personality, since persons of very different temperamental make-up seem to be able to achieve equal degrees of success in practical teaching, proposes the following qualities as being abilities which the teacher can in some measure cultivate: -

- a. leadership (i.e. 'fairly assertive, possessed of initiative, tact and capacity for understanding those whom they lead),
- b. other temperamental characteristics:
 - i. carefulness
 - ii. initiative
 - iii. persistence
 - iv. sociability
 - v. sense of humour
- c. attractive, cheerful appearance and bearing,
- d. good speech,
- e. good deportment,
- f. vitality.

ii. An Analytical Approach to the Assessment of Teaching Ability

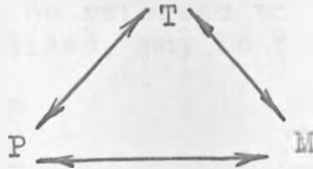
The review of previous investigations on the assessment of teaching ability indicates that although such progress has been made in many fields and in many directions towards a greater understanding of the problem, yet no objective identification of the ability has been made.

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73. Panton, J.H. (1947). "Modern Teaching Practice and Technique". London, pp. 281-7.

A fresh approach to the problem is now suggested. We may consider all teaching techniques to be a function of an activity, social and dynamic in nature. The teaching situation, whether it centres around a free-activity, a lecture, a project, a survey, a discussion, a visit or any other technique, appears to be energised from three distinct focal points, namely: -

1. the 'teacher'
2. the 'pupils', and
3. the 'material' arising during the activity.

The teacher releases and controls the activity, the pupil participates in the activity, and the material is the nature of all the content which makes the activity of value to the members of the group experiencing the activity. An attempt is thus made to embrace all forms of teaching, without exception, and to include all teaching techniques which may arise from a particular principle or aim of education or philosophy of life. It is advantageous to the discussion to replace these fundamental focal points by the letters T, P and M respectively and to place them at the corners of an equilateral triangle: -



Thus, if we view the 'T' pole to embody all types of 'teachers', namely lecturers, class-room teachers, discussion group leaders, tutors, leaders of projects, surveys, 'free activity' classes, demonstrator, craftsman and the like, we shall attempt to personify in the concept 'T' all the functioning abilities that emerge from or converge at this point. Thus the 'T' concept would include an A.S. Neill, who, pleading with all eloquence for the freedom of the young from adult interferences, does not withdraw himself completely from the 'teaching situation'. His presence has a marked effect on the development of those under his charge. Similarly, it includes the 'observer' of the Montessori teaching, for as Nunn (74) put it many years ago, in speaking of the teacher as an observer, Dr. Montessori has in view not a merely passive onlooker, but an active observer - one who "stands by" in the nautical sense of the

74. Nunn, P. (1931). "Education: Its Data and First Principles". London. 2nd Edition. p. 109.

term, refraining from fussy interference, but ready to lend a hand when help is called for ... and, like a watchful but restrained mother, must look for the moment when a word will be truly in season or a suggestion judicious'.

Secondly, the 'P' concept is intended to embrace all who are being taught, whether they be class-room pupils, students, laboratory or workshop students, members of a discussion group, members enjoying spontaneity in play, artisans, apprentices; that is, all those, irrespective of age, who, within the activity, are considered members of the group being 'taught'. And thirdly, the 'M' concept is the material concept, and is meant to include subject matter, skill, knowledge that is, the substance of the activity, which leads to an awareness and response of the 'T' and 'P'.

Viewed dynamically, these three focal points within the activity, are related. There is an interaction of a bi-directional nature between them. If we combine them by all possible combinations and indicate by an arrow the nature of the direction of the interaction, we obtain six secondary concepts of the teaching situation, which subsequently will be referred to 'as second-order concepts'. These, when symbolised, may be represented (x) as: -

1. T → P
2. T → M
3. P → T
4. P → M
5. M → T
6. M → P,

and may be thus simply defined. Using generalised symbols, an $X \rightarrow Y$ concept implies the extent to which X is influencing or tends to influence Y. Thus the second-order concept $T \rightarrow P$ implies the total influence which, independently of M, T has or is having, in any particular situation on P. It will involve many aspects of the behaviour-personality pattern of both T and P. Such descriptive teacher qualities as good or poor discipline, being 'en rapport', love of children, willingness to teach the duller as well as the brighter pupil, and many other aspects fall within the concept. The $P \rightarrow T$ concept has an entirely different meaning. Broadly it implies the influence that P is having on T, again regardless of the

x) These symbolised forms are used in the later discussion.

'material' M; and may be interpreted as the reaction that P has to T, again independently of M, and can be conceived as that total part of T which disposes P to learn in consequence of being in the presence of T.

Similarly, the $T \rightarrow M$ concept defined, is "the total influence, independent of P, that T has or is having on M". It must contain such teacher qualities as knowledge of the subject taught, ability to grow in M (where M contains 'other' or related subjects and other ways of knowing,) the ability to select and rearrange M.

The reaction second-order concept $M \rightarrow T$ represents the influence of the M on T. Such traits and qualities resulting from the influence of a general education, a cultural background, professional and technical skill arising from 'M' experiences in industry and life itself are examples of this concept.

The $P \rightarrow M$ and $M \rightarrow P$ concepts, although embracing the same two poles, have entirely different interpretations. The former is the influence that P has on M and to it must be attributed those contributions which the 'P' focus of the class-room activity make to the teaching experience, without the aid of the T. This concept receives a strong living emphasis in those teaching situations when the pupil is 'learning by doing' or 'learning by experience'. Such teaching techniques as the project method or survey contain a large measure of this concept which reflects the gainful extent to which pupils and students find, experience, or discover knowledge, skills and social behaviour patterns of their own account while doing or living. The success of a project, is to the writer, an essential measure of some part of that ability in a person that we call teaching ability. It is advanced that this $P \rightarrow M$ is an important part of all teaching situations and a measure of the concept reflects the extent to which teaching ability can be said to have been shown within the teaching situation.

The $M \rightarrow P$ concept is concerned with the effect of the M concept on P, and is the influence of M on P. Illustrative examples contained therein would include the extent to which the lesson material has been worthwhile, the effective nature of the teaching situation in providing opportunities to think, to reason; or, in other terms, what has been the effect of the lesson material upon the student.

It is advanced that these concepts are a natural extension of Haggerty's suggestion (75) in 1932, that the

75. Haggerty, M.E. (1932). "The Crux of the Teaching Prognosis Problem." School and Society, Vol. XXV, No. 904 (April) pp. 545-549

crux of the problem of the assessment of teaching ability (in so far as it then affected prognosis) lay in the teacher-pupil relationship. The good teacher in one class is not necessarily good in another. Neither is a successful teacher in one subject necessarily a successful teacher with a different subject in the same class. There should be an optimum expression of scholarship and worldly knowledge between pupil and teacher according to the needs of the pupils in the widest sense. Different optimums are required for different types of lessons depending on the different aptitudes and abilities of the pupils. Similarly, in personality measures, the amount of a certain trait necessary for successful teaching depends as much on the personality and make-up of the pupil as that of the teacher. With one class a teacher may need to call upon a reserve of fairness, doggedness and firmness, yet with another, the class as a whole may require an enthusiastic and lively presentation for the teacher to remain effective; while a third class may 'demand' a spell of firmness to follow a spell of teacher enthusiasm. Thus it appears, that the teacher needs to possess many 'dormant' traits of personality which will have expression as and when they are required. Concentration solely upon the teacher-pupil relationship in the teaching situation is not meeting the problem even half-way. Other relationships involving the material, are, it is advanced, of similar importance. The immediate relationships have already been discussed. Other relationships, however, certainly exist.

The analysis so far pursued is incomplete. We have considered each of the 3 poles to interact separately with the other two in 2 directions, but a series of third-order concepts are visible in the teaching activity. This series may be defined as the influence of one pole upon a second through the medium of the third. If we again entertain all possible combinations we find 6 of these third-order concepts. Symbolised, using the previous notation, these are: -

1. T → P → M
2. T → M → P
3. P → T → M
4. P → M → T
5. M → T → P
6. M → P → T.

In the closing paragraphs of this section, it is the intention to classify the various traits and qualities considered in the review of the previous methods used to investigate teaching ability, into all the concepts arising within this discussion. It is therefore essential that these six third-order concepts should be fully explained.

The $T \rightarrow P \rightarrow M$ concept differs from the $T \rightarrow M$ concept in that the P pole is part of the tie or tension between T and M . The middle term of all these third-order concepts may be viewed as a filter or medium or *modus operandi* of the concept. What is the influence of T on M in terms of P ? It certainly contains such aspects of the teaching situation as appropriate choice of the content of a lesson, or the 'tasks' in an assignment or project, or the choice of relevant teaching informative or illustrative examples whereby a lecturer displays real teaching ability. It contains the form of the black-board summary, the choice of vocabulary and the power of clear exposition. It implies the ability to select teaching aids in the way of films, posters, models, etc., to suit the pupils' abilities and aptitudes.

Similarly the $T \rightarrow M \rightarrow P$ concept represents the influence of the T on the P through the M of the teaching situation. It is not the direct $T \rightarrow P$ control or appeal nor the direct personality-personality relationship between T and P but this relationship through the medium of the lesson material. Such descriptive teacher traits as the power to arouse and maintain interest, to reach the pupil through the subject, to lead effectively to discussion, to frame suitable questions, are typically descriptive aids to qualities that fall either wholly or in part into the $T \rightarrow M \rightarrow P$ concept.

The $P \rightarrow M \rightarrow T$ third-order concept is basically the same as the last concept considered except that the dynamic action is in the opposite direction. It is on the pupil-response plane and represents the contributions made to the teacher in terms of the material by the 'learners'. It is that aspect of teaching ability which may be termed the pupil response to the development and success of the teaching situation which draws the pupil to the teaching. Simple illustrations are provided by written work achieved, by useful answers to questions, by contributions to discussions, by earnest pupil-questioning of the teacher, by apt illustrations drawn out of the class by the pupils. It contains the famous formula "elicit from the class" so loved by students of the decade before the last when preparing teaching notes.

The $P \rightarrow T \rightarrow M$ concept is again fundamentally a pupil-response concept. It is expressed in part by the extent to which the pupil is motivated to subscribe to the teaching experience through the medium of the teacher and in part by the extent to which the teacher filters, by accepting or 'rejecting' those pupil contributions which tend to promote successful teaching. Students will frequently suggest methods and ways of meeting class-room

problems which some teachers seize upon to aid their teaching, while others are too self-centred or pre-occupied to evaluate contributions which might lead them to adapt their presentation to the learner's way of learning. This third-order concept appears to include that aspect of teaching ability which sets up persisting task-tensions in the Nuttin (76) sense.

There remains but two third-order concepts of the teaching situation to define: the $M \rightarrow T \rightarrow P$ and the $T \rightarrow P \rightarrow M$ concepts. One represents the influence of the 'material' on the 'pupil' through the medium of the 'teacher' and the other the influence of the 'material' on the 'teacher' by means of the 'pupil'. The former mirrors the value of the actual teaching lesson on the pupil's growth, development, attainment, etc. as determined by the action of the teacher. It is concerned with the extent to which the teacher has permitted the 'right' experiences to impinge upon the pupil so as to have some purposeful effect upon the pupil. It does not imply a measure of the wisdom or folly of a teacher's choice, say of lesson development, but implies the change the pupil has experienced in consequence of that choice. It is thus quite distinct from the $T \rightarrow P \rightarrow M$ third-order concept.

The final concept of this series is the $M \rightarrow P \rightarrow T$ concept, and has already been explained. What measurable effect has the material of the lesson had on the teacher which has been brought about by teaching this pupil or group of pupils? The answer to this question defines the $M \rightarrow P \rightarrow T$ concept. Above all, the teacher will have changed. The change may be a slight or marked change of attitude as to a teaching technique, to a mode of lesson development, or to a clarification of a problem as to when children do not learn or 'behave'. The 'M' may have enlightened the teacher as to the attending patterns of learners. The concept embodies the results of self-criticism and appraisal.

The definitions given to all of the above concepts, whether first-, second-, or third-order concepts have received illustrative teaching examples which, it is believed, will clarify the meaning of the concepts. It is not intended that the specific illustrations, whether taken

76. Nuttin, J. (1947). "Respective effectiveness of success and task-tension in learning." B.J.Psy., Vol. XXXVIII, Part 2, p.53.

The frequency of mention of qualities within each group of studies deemed to fall within the individual concepts is given in table 2.

TABLE 2

Frequency of mention of qualities classified according to the analytical concepts.

Studies of	Analytical Concepts												
	T	T-P	T-M	T-P-M	T-M-P	P	P-T	P-M	P-T-M	P-M-T	M	M-P	
b. Rating scales	16	15	8	3	8		2	1	1	1		6	
c. Pupil change						1		1	1				
d. Pupil opinions	6	52	2	8	5					1		7	
e. Failures among teachers	16	9	4	2	4				1	2		1	
f. Successes among teachers	8	7	2	4	2		2	3	3	3		3	
g. Resignations	1	1											
h. Self-assessment	4	3		1	2		1	5	4	2	1		
i. Pre-service Selection	38	1	12	(1)								3	
j. Supervisors of student-teachers	22	10	3	2	(1)							4	
k. Qualities associated with teaching success	63	8	27	3									
l. Opinion of educationists	31	13	9	4	3			2	1	4	1	4	

While it must be stated that a classification of the traits, qualities and characteristics mentioned in the studies reviewed in Section II must depend upon the exactness of the meaning assigned to the words employed to describe those as acts, yet the general trend of the condensed classification of table 2 does indicate that the studies which used rating scales, teacher successes, self-assessment techniques and the expressed opinions of educationists have been approaching the assessment of teaching ability in terms of a majority of the concepts proposed. On the other hand, it seems that the remaining studies have tended to interpret the term 'teaching ability' through a much smaller number of concepts.

Indeed we may note the degree of similarity or dissimilarity in the various interpretations of 'teaching ability' by observing the extent to which particular interpretations make contact with the same or different concept pattern.

Thus in Section IIb, five studies which had employed rating scales of teaching ability were presented. Accordingly, the various items within these five scales have been classified, study by study, through their contact with the analytical concepts (see table 2b - appendix 1).

The studies are treated in their order of appearance and with limitations may be taken as representative of the opinion held on the problem of the assessment of teaching ability for the decade that any particular study represents. These investigations show a remarkable extension of the term "teaching ability" when viewed through the analytical concepts. The first scale of Ruediger and Strayer (1910) covers 4 concepts, mainly associated with the T and T → F pictures. The second scale (with fewer items) due to Thomson (1921) enters into 4 concepts, while Cattell's scale (1931) extends through 6 concepts. Martin's scale of rating ability (1944) receives an interpretation in terms of 9 concepts, but more than one-half of his item qualities are directly concerned with teacher qualities either in isolation or linked directly with the pupil and material. Jenkinson's scale (1945), however, is more dynamic in its relation with subject and learner. His 12 items enter into ten analytical concepts and no item is designed to assess the teacher directly but, on the other hand, to measure indirectly his successful relationships with the pupils and material.

Interpreting this change, it appears that the scales of the first three decades of the century tended to emphasize qualities of the teacher as an individual which were visible outside the teaching situation as well as visible within it,

(T concept), his orderly control of his pupils (T → P concept) and of subject matter (T → M concept). That is, the assessment of teaching ability was concerned with the assessment of the teacher and he was the only focal point for assessing his ability. Later scales seek other aspects, for example, pupil achievement and pupil vitality, the wider social influences of material on pupil development and that aspect of teaching ability which disposes pupils to participate in worthwhile activities and corporate learning. Thus the later scales sought the assessment of teacher ability through assessment of both teacher and pupil patterns.

The second table of Appendix 1 (table 2c) classifies the three studies of Section II c which dealt with measurement of pupil change. These three studies, American investigations, occurred in the fourth decade of this century and represent attempts to meet the practical difficulties of accepting the pupil plane as the ultimate plane for the scientific assessment of teaching ability. Of the three works, Coy (1930) by measuring pupil achievement in subject matter accepted the P→M concept as the determining concept of teaching ability. Matthews (1933) used the P concept, for he assumed that successful teaching could be translated into a measurable change in the I.Q. of those taught. Seyfert and Tyndal (1934) employed the P→T→M concept for they compared the differences in attainment of subject material by pupils brought about by two teachers of marked differences in the levels of their teaching ability.

Looking at those qualities of teachers which are desired by pupils and classifying these by the analytical concepts, we find (table 2d, appendix 1) that 52 of the 84 qualities mentioned are direct expressions of the T→P concept. Each of the eight studies emphasizes that the pupils themselves feel the influence of the teacher on them, in harmonious friendly personal relationships, and that this influence is of greater importance than their reaction and response to the teacher. Friendliness, fairness, an interest in pupils and like traits are dominant qualities that pupils admire. Yet such expressed desires reveal the need for friendliness, fairness and other aspects from teachers as unsatisfied hungers for the pupils. It is interesting to observe that whereas the early works of Kratz (1890) and Book (1905) specified this type of need only, later studies expressed other needs. Thus Bird's subjects (1917), while still pressing for T→P needs, found they valued clearness of exposition and preparation equally well. This excursion into the T→P→M concept arises again with the studies of Butsch (1931), Engelhart and Tucker (1936) and Eells (1938). In fact, in these

three works, eight desirable teacher qualities required by pupils fall under this heading. Further, and again from Butsch onward, both the $M \rightarrow T$ and the $T \rightarrow M \rightarrow P$ concepts arise, the former developing to the large cultural background and the latter to the ability to cope with individual pupil differences expressed by Hildreth's subjects.

It is not difficult to analyse out and tabulate under the fifteen concepts, those characteristics which studies have shown to be conducive to teacher failure (table 2e). The T and $T \rightarrow P$ concepts are well represented, yet not all teacher failures fall within these two categories. Of the former concept, such T characteristics as weak personality, laziness and poor health occur in studies from Littler in 1914 to Dodd in 1933. Of the latter concept, we find weak discipline, inability to co-operate and a lack of interest in the learner as recurrent characteristics of the failure in teaching. Causes outside these two concepts, are however, nearly as frequent, for 21 of the 46 characteristics mentioned in the six studies reviewed, must be classified under other second and third order concepts. Of these, the $T \rightarrow P$ concept is mentioned four times. Yet even with an adequacy of scholarship, the inability to judge the teaching material ($T \rightarrow P \rightarrow M$) and the inability to interest or to provide for individual differences ($T \rightarrow M \rightarrow P$) are characteristics of teacher failure. Both Barr (1929) and Dodd (1933) find further than non-success is linked with the pupil-response patterns within the teaching situation. Such examples as the inability of the teacher to socialise class discussion ($P \rightarrow T \rightarrow M$) and the inability to deal adequately with pupil contributions ($P \rightarrow M \rightarrow T$) are typical signs that third-order concepts are important parts of the total ability of the teacher. Further, poor preparation and poor organisation ($M \rightarrow T \rightarrow P$) are signs that a teacher is likely to fail.

Thus the characteristics of teacher failure just noted are not confined to second-order concepts but embrace the third-order. Because these studies were based on evidence secured from observers in the class-room, it is of importance to realise that failure in teaching ability is linked either generally or particularly with relationships involving the interaction of the teacher, the learner and the material of the lesson.

Considerable support to the analysis of teaching ability through the analytical concepts is provided by the studies of successes among teachers. If teaching ability is reflected in all the concepts proposed, we should expect studies of successes in teachers to provide evidence

that each concept is indeed necessary. That this is so, is clear from table 2f, where the classification of the characteristics occurring in the studies of Dodd and Barr show these characteristics to be fairly well distributed over all the concepts. All second-order concepts are included and only the M→T→P concept of the third-order concepts fails to find representation.

The single study, due to Champ (1948), into resignations from the teaching profession, emphasises the human relationships aspect of the T-pole, and serves to remind us that teaching ability must be considered in terms of such relationships.

The previous studies in general, do not stress the pupil-derivative concepts. Yet the studies which employed self-assessment techniques appear more concerned with attempts to judge the value of the teaching to the learner than attempts to judge the teacher in terms of either T-or M- concepts. Indeed of the three self-assessment rating scales discussed in Section IIh, such results of teaching as 'what has the learner actually learned?' (P→M) 'to what extent did the pupils respond' (P→T→M), 'how effective was the questioning' (P→M→T) occur in 12 of the 26 items which comprised the three self-assessment scales (Table 2h).

In contrast, however, when we view the qualities mentioned in studies which dealt with the pre-service selection of teachers and interpret these qualities in terms of our concepts, we find the main emphasis to be directed at two concepts. These are the T and T→M concepts. Of the 45 qualities mentioned in the nine studies, 38 are directly concerned with the T- concept and 12 with the T→M concept. Nevertheless, in these pre-selection studies, such expressions as "teaching qualities", "personal qualities" and "personality" although classified under the T-concept, may by the interpretation put upon them by the various selectors, merit identification with other concepts. On the other hand since these qualities were not measured in a teaching situation, some justification exists for their inclusion under the T-concept. Yet selectors do not select candidates with teaching ability but select those they believe to possess teaching aptitude, and who, with the right experiences, will develop the aptitude into an ability. Because our concepts involve all three poles and because at the time of selection our present techniques do not include aspects of the P-pole, it follows that consideration of the T, T→M and M→T concepts at the selection stage are likely to possess close contact with teaching ability. Yet it does appear that consideration from the P-pole is equally important. That

this is already recognised is well-known. Judgments of the candidate's qualities in this direction are provided by the heads and staffs of schools who know the candidate well, or alternatively, provision is made for a trial teaching practice run to be met before acceptance is finally made. Yet it is also recognised that candidates, apparently strong in T and M concepts, can fail in the teaching situation as soon as the P pole is with them in the class-room.

Indeed, we find from the studies of supervisors of student-teachers that the T→P concept is accepted by them as being of considerable importance (table 2j). It will be seen from the classification tables that the qualities mentioned by supervisors and embodied in this concept differ but slightly from those expressed previously from the opinions of pupils. We may note too that the four studies classified in table 2j, reveal no quality of the T-concept that has not been previously mentioned. Yet, of this group of four studies, three draw attention to the need for some measure of organisation of the teaching situation to be present.

In Section IIk, a survey was attempted of the more important studies which had sought the direct measurement of qualities associated with teaching success and which in all cases, had employed the correlation coefficient as a measure of association between the quality and teaching ability. It is to be expected that any table which classifies such qualities under our analytical concepts will call upon those concepts which are T-energised. Although certain qualities such as intelligence, health, and personality occur in many researches, we find that of the 101 qualities mentioned, as many as 63 fall under the T-concept, whereas only 8 fall under the T→P concept, 27 under the T→M concept and only 3 under the T→M→P concept (see table 2k).

When we turn to the classification of the opinions of educationists on teaching ability we find that the requirements of those considered are reasonably distributed over twelve of the fifteen concepts proposed (table 2l). This distribution is not even, nor do the requirements of any one writer fall within all the concepts. This is to be expected, for teaching ability is a dynamic functional ability, functioning in a present or immediate situation and influenced by past experiences and anticipations of future developments. Any interpretation of teaching ability is therefore bound to reflect the interpretation of a philosophy of education, or a concern with a particular field in education.

In general, however, the educationists considered emphasise qualities of the T, T→P, T→M concepts which other studies have also revealed. Yet many other concepts, both second and third-order are distinctly expressed. Both the McNair Report and the Report of the Scottish Advisory Council for Education stress general background (M→T), the ability to make the pupil respond (P→M) and the capacity to relate learning to the social and industrial life of the community (M→P). The T→P→M concept, which reflects the attitude of the teacher towards teaching the pupil, is portrayed in the qualities of lasting enthusiasm and vitality. It will be seen from table 21 that other third-order concepts are also demanded.

Three conclusions emerge from and may be used to summarise this detailed analysis. If we accept an assessment of teaching ability through assessments of the analytical concepts it follows from the preceding paragraphs that there has been a fair degree of overlap within the various approaches. This overlap, however, is localised. Mainly, it is confined to the assessment of qualities which have been associated with the teacher in isolation the teacher's influential relationship with his pupils and the teacher's control relationship with his material.

Second, that there is a marked diversity of teacher qualities within the approaches, for different studies show contact with different concept patterns. Moreover, the tables in Appendix 1 reveal that within many of the approaches, different concept patterns have been employed for different studies based on the same mode of approach.

Thirdly, there are indications that as far as some approaches are concerned, a considerable extension of the meaning of the term 'teaching ability' has arisen from research to research. Thus earlier researches involved a lesser number of concepts than was entered into by later works. The survey indicates the possibility that a complete picture of the assessment of teaching ability may be obtained by an extension through all fifteen analytical concepts.

SECTION III. NATURE AND DESCRIPTION OF THE EXPERIMENT

Details of the Rating Scale of Teaching Ability

It has been suggested (a) that a measure of the overall performance of a teacher may be found in terms of measures of the concepts previously defined. Accordingly, a rating scale of teaching ability was devised to embody all of these concepts. Some arbitrary planning was, of course, essential to the form of the scale. Twice as many item qualities were, in general, assigned to concepts involving the 'T' and 'P' poles as were assigned to concepts involving the 'M' pole.

Difficulty was experienced in choosing particular qualities to interpret the concepts. Those finally selected were: -

<u>Concept</u>	<u>Quality or Aspect Rated</u>	<u>Item No.</u>
T (Ts)	i. Speech-mechanics	7
	ii. Speech-vocabulary	20
	iii. Sense of Humour	13
	iv. Acceptability as a colleague	24 (b)
	v. Any negative physical qualities	22
T → P	i. Discipline	18
	ii. Co-operation	21
T → M	i. Knowledge of subject (theoretical aspect)	1
	ii. Knowledge of subject (practical aspect)	2
T → P → M	i. Use of illustrative material	9
	ii. Attitude to work	19
T → M → P	i. Meeting varying abilities within the class	3
	ii. Power of exposition	8
P P → T	i. Accessibility	14
	ii. Reaction of students to teacher's bearing	17

(a) Section II. ii.

(b) Item 24 is designated Ts, since it is concerned with an aspect of the teacher's maturity pattern.

<u>Concept</u>	<u>Quality or Aspect Rated</u>	<u>Item No.</u>
P → M	i. Ability to arouse <u>independent</u> thought and action	11
P → T → M	i. Ability to engage class in well- directed discussion etc.	10
P → M → T	i. Ability to get best from pupils by skilful questioning	15
M	(Use of blackboard)	16
M → T	i. Extent to which teacher is developing within his subject.	5
	ii. Does he have lively interests outside of his special subject?	6
M → P	i. Value of the quality of material presented	4
M → T → P	i. Extent originating school activities	23
M → P → T	i. Organisation of the lesson	12

It is not easy to explain why any particular item was finally selected to interpret a concept. The writer had obvious practical difficulties. In the first place, it was necessary to keep the scale to a reasonable length for practical usefulness, that is, the various assessors should find the final plan sufficiently short to be completed in a reasonable amount of time. Secondly, it was considered advisable to select qualities in which the specific nature of the quality was inherent in the concept with as little overlap between qualities as possible. and finally, the quality should be capable of being fairly well distributed between extremes in any batch of teachers and capable of being described at various levels by five clear but fairly concise descriptive passages to heighten the validity of the ratings.

Many preliminary discussions between the assessors and the writer took place before the final wording was accepted (a). Other than the first two items, which were concerned with the teacher's knowledge of the subjects and


-
- (a) The writer wishes to record his grateful thanks to his colleagues for their genuine and valuable criticisms in these early discussions. Some passages were drafted and redrafted before the final form met general agreement and approval.

skills taught, no attempt was made to arrange the items in any related order. It will be noted that the scale lines change directions at alternate lines (b) with the positive indication of each quality.

The rating scale of teaching ability was finally printed. A copy is attached at Appendix 2. Nevertheless the nature of the general layout and characteristics may be seen from the two following items which have been taken from the scale.

Item 3. Is the teacher able to meet the varying abilities within the class?

Treats class as a unit, neglects bright and dull.	Prepared to let some 'sink or swim'.	Tries to make adjustments, sometimes with success.	Adjustments made, but often unmethodically	Diagnoses levels of capacity, stimulates all types
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Item 14. Is he 'en rapport' with his class?

Harmony with class complete	Teacher not always accessible	Contacts made occasionally	Difficulty in contacting class	Teacher 'walled off from class.'
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(b) In the early experimental work for this investigation, these 'scale lines' were annotated at their extremities with the figures 0 and 10. This practice led to misunderstandings and was dropped.

The twenty-four questions finally chosen, were: -

1. Do you consider that the teacher knows his subject?
(Theoretical aspect)
2. Do you find the teacher skilled in his craft?
(Practical aspect)
3. Is the teacher able to meet the varying abilities within the class?
4. Is the quality of the material presented of value?
5. Does he have the potentialities for growth? Is he actually growing in his subject?
6. Does he have lively interests and a valid information outside of his special subject?
7. Is his speech clear and directed towards his audience?
8. Does he possess the power of clear exposition?
9. Has he the ability to illustrate his subject through concrete and living illustrations, and where suitable to use visual aids?
10. Can he engage his class in lively, well directed 'discussion' and/or 'co-operation'?
11. Is he able to interest his students in his subject, to maintain such interest and to stimulate them to independent thought and action?
12. Does he possess and display a sense of humour?
13. Does he show evidence that he has organised his lesson well?
14. Is he 'en rapport' with his class?
15. Has he the ability to get the best from his pupils by skilful useful questions?
16. Has he the ability to take full advantage of his blackboard?
17. How do the students react to the teacher's bearing?
18. Has he the power to maintain discipline satisfactorily among his pupils?
19. Is his attitude to his work vigorous and persevering?
20. Has he a sufficient command of language?
21. How do you consider he co-operates with his pupils?
22. Does he have any negative physical qualities (not dealt with in 1-21) that might interfere with his success as a teacher? If so, write them here briefly.
23. To what extent does the teacher participate in school activities?
24. To what degree is the teacher likely to prove an acceptable colleague in the staff-room?

The instructions to the assessor were: -

- (1) Assess the teacher on each quality separated without reference to other qualities.
- (ii) Place an 'X' somewhere on each line to show where you think the teacher stands in respect to the quality described.

- (iii) It is important that your 'X' be placed wherever it best describes the teacher. It need not necessarily appear over one of the descriptions given.

The various assessors agreed as a principle of technique, not to complete the rating scale either during the actual lesson or during the remainder of the day on which the lesson was observed. In general, ratings were made on one of the two days following. Naturally, the assessors referred to written comments made at the time of witnessing the lesson. After the rating scale was completed, an overall teaching mark based on the assessor's own interpretation of what constituted successful or unsuccessful teaching was made on an eleven point scale as follows: -

- A. Outstanding, distinctive
- A- Of 'A' ability, but tends to a 'B' performance
- B+ Of 'B' ability, but indicative of 'A' performance
- B. More than satisfactory
- B- Tends to be only satisfactory
- C+ Shows signs of becoming 'more than satisfactory',
i.e. B
- C. Satisfactory (Average)
- C- A 'C' tending to 'weak'
- D+ 'Weak' but indicates may be satisfactory
- D. Weak, doubtful
- E. Fail.

The object of the above scale was to develop a numerical method of global assessment so that statistical tools could later be applied. Agreement was reached by the assessors on the interpretation of the plus and minus signs by a careful adherence to the meaning of such significant words as 'tends', 'indicative', 'shows signs of becoming'. These were taken to imply that small but observable signs which failed to place the teacher ably in the one of the four ranks, A,B,C and D, merited a distinguishing mark. A negative sign would be taken by each assessor to be a higher award than one with a positive sign of the next letter. To clarify this further by examples, it follows that a B-mark was superior to a C+, a D+ inferior to a C-, and an A-superior to a B+. Thus having first placed a teacher in one of the five categories, A,B,C,D or E, the assessor would then place if necessary, the appropriate sign.

All of the assessors were on the staff of the Training College where these students were following their course of training. The assessors only assessed lessons in the fields in which they themselves were specialists in the subject or skill being taught.

Particulars of the Subjects of this Investigation

a. General. Before selection, candidates had to show that they had industrial or commercial experience and possessed qualifications in technical or commercial subjects at approximately Higher National Certificate level or in the case of trade subjects the appropriate City and Guilds of London Institute Certificates. These conditions being satisfied, the candidate appeared before a selection board which included H.M. Inspectors, a Principal of a Technical College, the Director of the Training College and a member of the Training College tutorial staff. The purpose of the interview was to assess the personal qualities and suitability of the candidate for training as a teacher.

It will be apparent therefore, that the group of subjects from whom the data of this investigation was obtained was highly selected (a).

b. Analysis of Subjects with respect to material taught.

The total number of student-teachers was 87, made up as follows of the following subject teaching group.

<u>Subject teaching group</u>	<u>No. in group</u>
Commerce	41
Engineering	16
Women's Trades	22
Printing	1
Painting and Decorating	7
	—
	Total 87

c. Age of subjects These were distributed as follows:

	<u>Commerce</u>	<u>Engineering</u>	<u>Women's Trades</u>	<u>Printing</u>	<u>Painters</u>	<u>Totals</u>
21 - 25	1	1	2	-	-	4
26 - 30	7	6	4	-	1	18
31 - 35	18	5	3	-	3	29
36 - 40	11	4	8	1	3	27
41 - 45	3	-	4	-	-	7
46 - 50	1	-	1	-	-	2
Totals:	41	16	22	1	7	87

(a) Actually 40% of those interviewed were accepted.

Women's Trades and Crafts

<u>City and Guilds of London Institute</u>	
i. Teachers Certificate	7
ii. Ordinary	8
Diploma in Household and Institutional Management	2
Associate of the Institute of Hygiene	1
No Qualification	4
	—
	22
	—

Printers and Decorators

i. City and Guilds - Full Technological Certificate	6
ii. Diploma and Travelling Scholarship	1
	—
	7
	—

Printers

i. City and Guilds - Full Technological Certificate	1
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The qualifications are far from homogeneous. Paper qualifications ranged from five with no qualification to six at university graduate or diploma level. To ease the presentation of the picture of the educational background of the subjects, these paper qualifications are re-grouped below.

University - Degree or Diploma standard	6	
Membership of Professional Association - Final	37	(a)
University - Intermediate	4	
Membership of Professional Association - Intermediate	2	
City and Guilds of London Institute or equivalent	21	
Other examination	12	
No qualification	5	

(a) Many of these qualifications entitle a teacher to be classed as a graduate for salary purposes - see Report of the Burnham Committee on Scales of Salaries for Teachers in Establishments for Further Education (1948) Appendix IV, p.21.

e. Previous Education: Full-time and part-time

Of the 87 subjects, 60% had received a Secondary Grammar School education, 11.5% had attended Secondary (Technical Schools), and 26.5% Modern (i.e. 'Senior Elementary') Schools. Two (both from the Commerce group) received their full-time education at private schools.

The following table lists the types of previous full-time education among the subjects.

Type of School	Commerce	Engineering	Women	Printers Painters	To- tal	% of Total
Secondary Grammar	30	7	13	2	52	59.8
Secondary Technical	1	6	2	1	10	11.5
Modern or Central	8	3	7	5	23	26.4
Private	2				2	2.3
	41	16	22	18	87	100.0

Nevertheless, 71 (representing 82%) of the 87 students had continued their education at part-time classes. In fact, a large proportion had obtained the qualifications presented in a previous section at evening classes in technical and commercial evening schools, technical colleges, monotronics and polytechnics. Of these, within the commerce group 38 (93%) had supplemented this full-time education with part-time education. Corresponding figures for the other three groups were 10 (62½%) of the engineering group, 15 (68%) of the group of women's crafts, and all the members of the printing, painting and decorating group. Since nearly all of the technical and commercial professional final trade qualifications were obtained through part-time educational facilities of one kind or another, fitness of educational background to teach a subject or a group of subjects invariably rested upon the student's own pursuit of professional knowledge.

f. Industrial, Trade or Commercial Experience

One of the main features indicating suitability to teach in the field of teaching under investigation was an indication of sound and suitable industrial, trade or commercial experience. Length of such service is not a sound criterion to judge this, nor was it so in selection techniques. The nature of work and duties, the types and standards of work, and craftsmanship of a firm or firm's product were also taken into serious account. Nevertheless, an indication of the length of experience in industry and commerce is provided over page. This data indicates a mean

pre-teaching experience in industry, trade and commerce of all students of 11.2 years.

Years	Commerce	Engin- eering	Women	Printers Painters	Total
0 - 5	4	1	7	2	14
5 - 10	9	4	8	2	23
10 - 15	16	5	3	2	26
15 - 20	10	4	3	2	19
20 - 25	2	2	1		5
	41	16	22	8	87
Mean Experience (yr.)	12.1	13.1	8.6	10.0	

g. Teaching Experience previous to taking up Course

Unlike most previous researches in this field the majority of the subjects of this investigation had already had teaching experience either as part-time teachers in day or evening sessions in Technical and Commercial Schools, or in the Services. The appropriate data is: -

	<u>Commerce</u>	<u>Engin- eering</u>	<u>Women</u>	<u>Printers Painters</u>	<u>Totals</u>
Part-time Evening or Day Teach- ing Experience in Tech. Schools, etc.	20	2	12	4	38
In the Services only	14	7	1	1	23
	34	9	13	5	61

h. Summary

Thus the subjects comprised a highly selected group. Approximately three-quarters had received a Grammar or Technical School Education and one-quarter a "Senior" School education. 82% took professional or trade qualifications through part-time education. The average age was nearly 34 and mean experience in industry or commerce was just over eleven years. All students had served for a period under National Service.

The rating scale of teaching ability was completed in respect of 338 lessons. All of these lessons were given either in Technical (Secondary) Schools, Technical or Commercial Colleges, Polytechnics or Monotechnics. Subject tabulation is extremely difficult owing to the very large number of subjects delivered, but by subjects within groups, the lessons were linked with: -

1. Engineering	46 lessons
2. Printing; Painting and Decorating	19 lessons
3. Women's Subjects (e.g. Cookery, Dressmaking)	80 lessons
4. Commerce	193 lessons

Total: 338

The distribution of the global mark throughout the various subject groups was as follows: -

	<u>Engineers Printers Painters & Decorators</u>	<u>Women's Subjects</u>	<u>Commerce Group</u>	<u>Totals</u>
A	4	-	5	9
A -	2	-	10	12
B +	6	7	16	29
B	6	18	24	48
B -	8	14	30	52
C +	28	17	47	92
C	5	14	23	42
C -	4	7	19	30
D +	1	1	10	12
D	1	2	8	11
E	-	-	1	1
<hr/>				
Totals:	65	80	193	338

The distribution of these teaching marks is plotted in Diagram 1. This distribution will be seen to conform very favourably with the normal distribution. Indeed, on testing, we find the distribution to be symmetrical and not significantly different from the normal form. Using the first four moments about the mean (77), $\beta_1 = \mu_3/\mu_2^3 = -.000045$, whence $\gamma_1 = \sqrt{\beta_1} = -.007$ (S.E. .133) showing that the distribution is not skewed. Also $\beta_2 = \mu_4/\mu_2^2 = 2.9266$, whence $\gamma_2 = \beta_2 - 3 = -0.073$ and hence the distribution curve is only slightly platykurtic. But as γ_2 is considerably less than twice its standard error ($=0.266$), the distribution of the overall assessments for teaching ability does not differ significantly from the normal curve of distribution (a).

77. Goulden, C.H. (1939). "Methods of Statistical Analysis" London. p.28.

(a) The calculations were corrected for Shepherd's correction. The formulae employed for the μ_n were: -

$$\mu_2 = v_2' - v_1'^2 - \frac{1}{12}$$

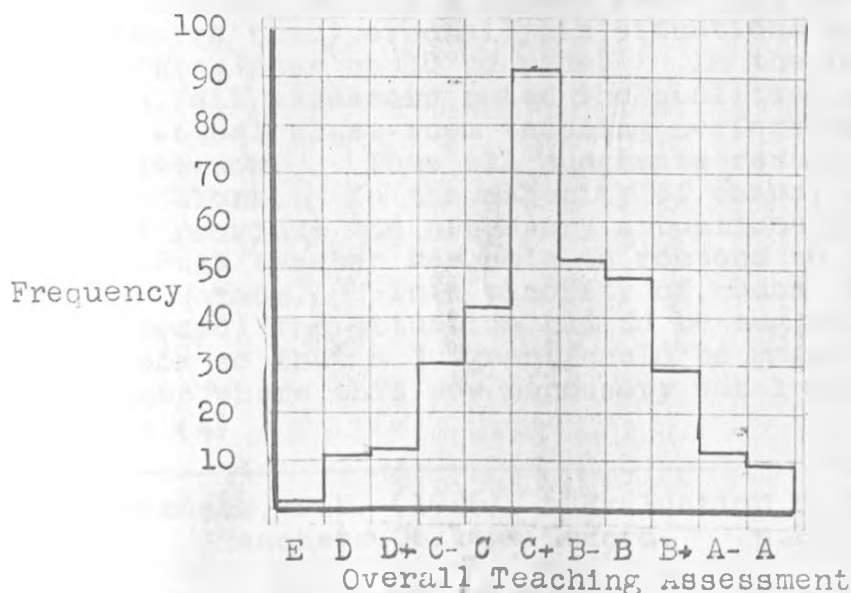
$$\mu_3 = v_3' - 3v_1'v_2' + 2v_1'^3$$

$$\mu_4 = v_4' - 4v_1'v_3' + 6v_1'^2v_2' - 3v_1'^4 - \frac{1}{2}\mu_2 - \frac{1}{80}. \quad (78)$$

78. Chambers, E.G. (1946). "Statistical Calculations". C.U.P. pp. 28,29.

DIAGRAM I

Distribution of the Overall Assessment of Teaching Ability
(N = 338)



The quantifications of the judgments of our analytical concepts in terms of amount or degree thus makes use of the well-known rating methods, have in the past proved unreliable and indeed from time to time have been discredited (79,22).

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79. Rugg, H.C. (1921 and 1922). "Is the Rating of Human Character Practicable?" J.Ed. Psy., Vol. XII. pp. 425-438, 485-501, Vol. XIII, pp. 30-43, 81-93
22. Butsch, R.L.C. (1931). "Teacher Rating" R. Ed. Res., No 1. pp. 99-107. p. 106.

According to Symonds (50) the ineffectiveness of rating techniques 'must be attributed in part to the poor quality of the evidence on which the judgments are based, the lack of training of the persons making the judgments and faults in the rating methods themselves'. Although no attempt will be made to set forth the characteristics of a good rating technique, yet it is important that certain points affecting the rating scale and its use in this investigation be emphasized. Undoubtedly rating methods, when properly used, have proved to be a satisfactory method of gauging personal qualities (80, 81).

In the first place, ratings should be based on observed evidence. The inadequacy of most rating schemes derives from the fact that those who are asked to make judgments of individuals have never had an opportunity to observe them personally in situations where judgments concerning them could be made. In the present investigation, all assessors rated the qualities of each teacher on an actual class-room teaching performance observed by the assessor. Thus all judgments result from first-hand observations. In the majority of cases, the actual lesson provided the necessary situations in which the individual teacher was able to respond so that the judgments could be made. In a minority of cases, (e.g. use of the blackboard) the situation had to be suggested by the assessor so that a judgment could be made, but the number of cases where this was necessary was indeed remarkably small. (a)

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50. Symonds, P.M. (1946). "Evaluation of Teacher Personality" Teachers College Record. p.24.
80. Murray, H.A. and others. (1938). "Explorations in Personality". N.Y., O.U.P.
81. Timpany, N. (1947). "Assessment for Foremanship". B.J.Psy., Vol. XXXVIII. Part 1. pp. 25-27.

(a) In the case of item 3 ('Do you find the teacher skilled in his craft?'), of item 22 ('Does the teacher possess any negative physical qualities that might interfere with teaching success?') and item 23 ('To what extent does the teacher participate in school activities?') the various assessors were unable to pass judgment in all the lessons observed. For this reason, it has been found necessary to omit the data from these items in parts of the later discussions (for example, under factorial analysis) where the variation in the number of cases observed has to be taken into account.

Secondly, the rater should be familiar with the rating procedure. He should know the meaning of each scale on which he is required to rate an individual and he should have a feeling for the meaning of each step on the scale. It is believed that the assessors used in this investigation, were exceedingly well-equipped with respect to their ability to interpret, with reasonable accuracy and reliability, the scales on the item qualities, by adequate discussions to clarify misunderstandings. Thirdly, a good rater pays attention to the distribution of his ratings. He attempts to spread them out so as to cover the range of steps provided in the scale, whereas the untrained rater tends to bunch his ratings at a point somewhere above the average position on the scale and is reluctant to give ratings below the average position except in well-defined and obvious cases. In this investigation, whilst recognising that a group need not necessarily distribute itself according to the normal curve of probability in every characteristic, yet it was recognised that a normal distribution is the most commonly found distribution of measured traits. Hence, in general, it was borne in mind that the distribution of ratings should conform to the normal curve. Yet, because the assessors had worked as a team in many directions, some teachers and visiting lecturers were known to all assessors. These served as a basic reservoir from which steps within the various scales could be identified by assessors on a 'man-to-man' comparison. Consequently, because of these precautions, it is felt that the ratings in this investigation are not lacking both in validity and reliability.

The judgments on the rating scale were quite easily translated to a numerical award from 0 to 10. The distribution of these marks on 21 item qualities is given in Table 3.

TABLE 3. Frequency of rating score for each of twenty-one item qualities.

Rating Scores

Item	0	1	2	3	4	5	6	7	8	9	10
1		8	15	32	46	46	34	38	62	43	14
3	12	18	12	23	37	43	53	48	36	49	7
4	5	26	9	5	13	21	25	76	74	48	36
5	4		8	18	35	48	93	33	42	46	11
6	5	29	34	50	21	45	39	42	50	9	14
7	1	4	11	22	41	55	60	44	58	28	14
8		8	4	11	17	29	68	62	72	37	30
9	6	23	18	28	27	58	35	38	51	34	20
10	4	5	14	27	34	36	54	58	78	18	10
11	2	5	18	24	19	58	43	60	68	34	7
12	1	6	4	13	20	26	40	76	78	44	30
13	11	35	11	15	41	75	70	29	34	14	3
14	3	4	13	22	33	36	46	46	61	43	31
15	4	17	35	50	32	56	40	40	47	14	3
16	-	9	6	9	30	57	68	40	40	57	22
17		2		9	11	33	30	71	115	61	6
18	2	5	10	15	39	58	56	54	49	38	12
19		2	2	4	7	28	29	59	93	84	30
20		1	4	14	28	71	86	38	29	37	30
21			1	1	2	14	12	63	111	103	31
24		1	8	6	16	16	23	65	99	83	21
Totals:	60	208	237	398	549	909	1004	1080	1347	924	382

Grand Total: 7098=338 X 21

Histograms to illustrate the frequency of the individual scores on the item-qualities of the rating scale are given at Appendix 3. The distributions for items 4,5,7,8,10,11,12,13,14,18,20, do not depart seriously from the normal form. Those for items 17, 19,21 and 23 tend to leptokurtic, being sharply peaked relative to the normal curve whereas those for items 1,3, 6,9,15 and 16 tend to be platykurtic.

SECTION IVPreliminary Analysis of Data

It will be recalled that the Rating Scale of Teaching Ability was completed in respect of 338 different lessons. Each of these lessons was assessed in two ways. Firstly, a global or overall mark of teaching ability (on an eleven-point scale) was awarded, and secondly, a rating of the 24 item aspects as given by the rating scale followed. It is important initially to realise the degree of stability of this global mark. Although it was difficult to plan for any independent assessments of the overall mark of teaching ability in all the subjects (i.e. persons) in this investigation, yet during the experiment, the teaching staffs of the colleges where the students took this teaching practice, returned a n overall mark of teaching ability for nearly every subject. Towards the end of the course, inspectors of the Ministry of Education assessed the teaching ability of 35 subjects. The inter-correlations of these three different marks (N = 35) were:

	Practice School Staff's Mark	Inspector's Mark	Training College Tutor's Mark
Practice School Staff's Mark	.	0.50	0.81
Inspector's Mark	0.50	.	0.47
Training College Tutor's Mark	0.81	0.47	.

As far as is known, the inspector's assessment was made independently of the practice school staff's mark and the training college tutor's mark. No marks were conveyed before the inspector's assessments were made and it is doubtful whether any 'halo' effect arises from pre-assessment discussion. On the other hand, because the training college tutor did discuss the teaching ability of subjects with the practice school staff, the correlation of 0.81 is most unreliable. The two remaining correlations indicate that the stability of the criterion of teaching ability is not unduly low.

It is now of interest to ascertain the extent to which each item quality by itself reflects the teaching ability portrayed by the global mark, and to discover those items which appear to demonstrate teaching ability to a stronger extent than others. Accordingly, the table 4 lists (to four decimals in column 3 and to two decimal places in column 4) the correlation coefficients (a) between the item scores and the overall mark.

(a) The formula employed was the usual product-moment; -

$$r = \frac{\sum x_1 x_2}{\sqrt{(\sum x_1^2) (\sum x_2^2)}}$$

TABLE 4. Correlation Coefficients between item scores and overall teaching mark.

Item	Description	Correlation Coefficient	
1.	Do you consider that the teacher knows his subject? (Theoretical aspect)	+0.5230	0.52
2.	Do you find the teacher skilled in his craft? (Practical aspect) (N = 189)	-	0.54
3.	Is the teacher able to meet the varying abilities within the class?	+0.5914	0.59
4.	Is the quality of the material presented of value?	+0.6806	0.68
5.	Does he have potentialities for growth? Is he actually growing in his subject?	+0.6353	0.63
6.	Does he have lively interests and a valid information outside of his special subjects?	+0.5249	0.52
7.	Is his speech clear and directed towards his audience?	+0.5558	0.56
8.	Does he possess the power of clear exposition?	+0.6598	0.66
9.	Has he the ability to illustrate his subject through concrete and living illustrations and where suitable to use visual aids?	+0.6655	0.67
10.	Can he engage his class in lively, well-directed 'discussion' and/or 'co-operation'?	+0.6969	0.70
11.	Is he able to interest his students in his subject, to maintain such interest and to stimulate them to independent thought and action?	+0.7508	0.75
12.	Does he show evidence that he has organised his lesson well?	+0.6708	0.67
13.	Does he possess and display a sense of humour?	+0.5023	0.50
14.	Is he 'en rapport' with his class?	+0.5782	0.58
15.	Has he the ability to get the best from his pupils by skilful useful questions?	+0.6252	0.63

16.	Has he the ability to take full advantage of his blackboard?	+0.5753	0.58
17.	How do the students react to the teacher's bearing?	+0.5929	0.59
18.	Has he the power to maintain discipline satisfactorily among his pupils?	+0.5674	0.57
19.	Is his attitude to his work vigorous and persevering?	+0.6095	0.61
20.	Has he a sufficient command of language?	+0.5182	0.52
21.	How do you consider he co-operates with his pupils?	+0.4612	0.46
22.	Does he have any negative physical qualities that might interfere with his success as a teacher?	-	-
23.	To what extent does the teacher participate in school activities?(N=68)	-	0.54
25.	To what extent is the teacher likely to prove an acceptable colleague in the staff-room?	+0.5190	+0.52

In any interpretation of these values it is necessary to bear in mind that whereas the various assessors felt confident to assess 21 of these items in each and every lesson, they were unable to do so in respect of item 2 (the teacher's subject craft skill in the practical sense) which was rated at 189 lessons, item 23 (the teacher's participation in school activities) which received an award at the same time as 68 lessons were assessed, and item 22 (negative personal qualities of the teacher) which called for responses on only 8 occasions.

All the correlation coefficients of the item ratings with the global assessment of teaching ability are positive and significant. They ranged from 0.46 to 0.75. If we take the magnitude to indicate the importance of the item quality within the total meaning of teaching ability, we obtain the following relative order of importance, beginning with the most influential.

Order	Item (and brief description)	Value of r. (+)
1.	11. (Stimulating and maintaining interest.)	0.75
2.	10. (Class co-operation, discussion)	0.70
3.	4. (Quality of lesson material)	0.68
4.	(12. (Lesson organisation)	0.67
5.	(9. (Lesson illustration)	0.67
6.	8 (Clearness of exposition)	0.66
7.	5. (Teacher growth in subject taught)	0.54

Order	Item (and brief description)	Value of r. (+)
8.	15 (Use of questions)	0.63
9.	19.(attitude to work)	0.61
10.	(17.(Bearing in the class-room)	0.59
	(3.(Meeting varying abilities of pupils)	0.59
12.	(14.(Teacher accessibility,	0.58
	(16.(Use of the blackboard)	0.58
14.	18.(Maintaining discipline)	0.57
15.	7.(Clearness and forcefulness of speech)	0.56
(16.	2.(Teacher's standard of craftsmanship)	0.54
17.	(6.(Teacher's interests in allied subjects)	0.52
	(1 (Teacher's specialist knowledge)	0.52
	(20.(Language and vocabulary)	0.52
	(24.(Acceptability as a colleague)	0.52
21.	13.(Sense of humour)	0.50
22.	21.(Co-operation with pupils)	0.46

Whilst great caution must be exercised in drawing conclusions from such an order, since the differences between the values which produce the order are fairly small, yet a few broad observations appeared justified. Firstly, the ability to interest students and to maintain such interest leads the list. This ability, which is itself complex, and which in this investigation, was measured directly by observing the extent to which the teacher created either a distaste for the subject or aroused enthusiasm for further study, is apparently more important than such aspects as the teach subject knowledge and skill, clearness and forcefulness of speech, his teaching skills and techniques, and the rest assessed. It is worthy of note that this ability to interest the younger people in the classroom has a greater contact with teaching ability (as interpreted by the assessors employed in this investigation) than the richness of personal and social relations with pupils in the classroom or out-of-school activities and colleagues in the staff-room.

Now in considering the nature of teaching ability, it was decided to analyse it as a number of first, second and third-order concepts involving 'T', 'P' and 'M' relationship. Indeed, the character of the rating scale was such that each item quality was chosen to represent, as far as possible these separate concepts. It therefore seems appropriate to view these concepts in the order of importance revealed by this investigation. Hence, reconverting the list preceding the last paragraph, we find that, if these concepts really exist, and if the item qualities chosen measure the concepts, then, in order of

relative importance, the concepts take on the following sequence: -

1. P → M
2. P → T → M
3. M → P
4. (M → P → T
(T → P → M
6. T → M → P
7. M → T
8. P → M → T
9. T → P → M
10. (P → T
(T → M → P
12. (P → T
(M
14. T → P
15. T
16. T → M
17. (M → T
(T → M
(T
(T
21. T
22. T → P

If we are able to accept the size of the correlation coefficient as a measure of relative importance, the above order presents some striking conclusions.

a) Whereas all the third-order concepts are found in the upper half of the list, all of the first-order concepts are found in the lower half. Second-order concepts appear in both halves.

b) All of the four measures employed to measure the 'T' concept, i.e. qualities of the teacher in isolation occupy very low places and are remarkably well bunched together (at 15th, 16th, 17th and 21st position).

c) Whereas the T → M concept is low (positions 16 and 18 and again grouped), the M → T concept is relatively much higher (positions 7 and 17). Thus it does appear that mere command over subject matter and subject skills are less connected with teaching ability, as understood by the assessors used in this investigation, than actual teacher growth and development within the subject.

d) The two concepts which head the list are: -

1. P → M
11. P → T → M

Both concepts are concerned with the pupil effort in the teaching situation, the former the extent to which the

pupil is stimulated to independent thought and action or to make his contribution to the lesson independently of the teacher, and the second the extent to which the pupil contributes to the lesson with the assistance of the teacher. These two concepts are immediately followed by the $M \rightarrow P$ concept, which, it will be remembered, was defined as the influence of the 'material' on the 'pupil'. Thus it appears that the assessment of teaching ability is more related to assessments of emerging pupil-material relationships than assessments of observable teacher-pupil relationships as has been frequently expressed previously.

e. Reviewing the positions of the T:P concepts, both second- and third-orders, we find some apparent inconsistencies. First, the second-order concepts, or direct-relationship between the 'T' and 'P' do not appear to have so high a contact with the criterion as the relationship between the 'T' and 'P' through the 'M'.

Thus the concept $T \rightarrow M \rightarrow P$ ranks higher (at 11) than the concept $T \rightarrow P$ at (at 14 and 22). Similarly the $P \rightarrow M \rightarrow T$ (at 8) is above the $P \rightarrow T$ concept (at 10 and 12). It is thus possible that the qualities which portray direct ties in the human teacher:pupil relationship in the class-room are lower measures of teaching efficiency than are the qualities from the teacher:material:pupil relationship. Indeed, the writer believes that some teachers who apparently have the personality traits which draw them to either young children, adolescents and adults in ordinary everyday situations appear to lose these ties (a) as soon as they begin to teach a subject in the class-room or practical workshop.

(a) Occasionally, these ties can become 'tensions' (i.e. barriers) as soon as the teaching material is interposed between the teacher and those being taught. Such reversion is sometimes noticeable even in individual teaching. A case-study illustrates this point. Mr. C., who mixes well, is a good committee man, an excellent chairman of student committees, is tolerant, considerate and co-operate in such situations. In the class-room, when teaching a skill, he is inconsiderate, intolerant, and impatient when dealing with a class of adult students and even with an individual adult student who has difficulty in learning.

Multiple correlation by Straight Sum and Pooling Square

The matrix of inter-correlation coefficients between the scores on the twenty-one qualities (a) and the correlation coefficient between item scores and the overall or global mark teaching ability awarded on the same lesson is given at Table 5.

TABLE 5. Matrix of inter-correlation co-efficients between scores on twenty-one rated qualities.

2	1	3	4	5	6	7	8	9	10	11
-	.5230	.5914	.6806	.6353	.5249	.5558	.6598	.6655	.6069	.7508
-	-	.5176	.4259	.5169	.3421	.3959	.3997	.4343	.4195	.4911
-	-	-	.4403	.5102	.3865	.4432	.5084	.4791	.5862	.6006
-	-	-	-	.5136	.4597	.4254	.6468	.5523	.6458	.7022
-	-	-	-	-	.4739	.5148	.4500	.5299	.6111	.5903
-	-	-	-	-	-	.2844	.4333	.5325	.4801	.5720
-	-	-	-	-	-	-	.6224	.3606	.4173	.4773
-	-	-	-	-	-	-	-	.5163	.6536	.6483
-	-	-	-	-	-	-	-	-	.6117	.6241
-	-	-	-	-	-	-	-	-	-	.7353

Note: all the coefficients are positive.

Using the straight sum and pooling square technique (82), the best multiple correlation to be expected by an unweighted total of the individual quality scores with the assessors'

The following analysis is limited to the twenty-one qualities assessed in all 338 lessons. Thus it excludes items 2, 22 and 23.

Thomson, G.H. (1946). "The Factorial Analysis of Human Ability". University of London Press. p.99

view of teaching ability is +0.88 (b).

Thus the rating scale as such appears to provide a fairly sound estimate of teaching ability when the various ratings are merely added without emphasis on any particular itemised score. It is to be expected that by weighting the various scores a better estimate can be provided. That this is so is developed in the next paragraph.

b. Multiple correlation by Weighted Sum and Pooling Square

In order to determine the various weights to apply to the item quality scores the reciprocal matrix to the matrix of table 6 is given in table 6. The calculations were carried out to four places of decimals using an electrical calculating machine. The longer method of Aitken (82a) was adopted in order later to determine the variances and covariances of the regression coefficients and to test the significances of the regression coefficients derived.

(b) With the usual notation (ibid p. 86) $A = 1$
 $B = 206.1,$
 $C = 12.7$

whence

$$\text{best } r_m^2 = \frac{C}{\sqrt{AB}} = \frac{12.7}{\sqrt{206.1}} = 0.883$$

82a. See Thomson, G.H. (1946). Addendum, pp. 344 - 5

TABLE 6. Reciprocal Matrix to Matrix of Inter-correlation Coefficients (Table 5)

1.6986	.1261	-.0792	-.3728	.0158	-.1613	.1181	-.1885
.1261	2.0606	.4080	-.1700	-.0316	.0762	-.4198	-.1795
-.0792	.4080	2.7442	-.0917	-.0939	.2808	-.9063	-.2051
-.3728	-.1700	-.0917	2.4944	-.3025	-.1684	.1252	-.2743
.0158	-.0316	-.0939	-.3025	1.7927	-.0396	.1230	-.3730
-.1613	.0762	.2808	-.1684	-.0396	2.8175	-1.9797	.0374
.1181	-.4198	-.9063	.1252	.1230	-1.9797	4.2981	-.0414
-.1885	-.1795	-.2051	-.2743	-.3730	.0397	-.0414	2.1254
.0738	-.3781	-.3239	.2202	.0861	.4010	-.6492	-.3759
-.2177	-.4082	-.7288	-.0021	-.4583	.0380	-.1692	-.2429
-.3106	.2399	-.0356	.0241	-.3831	.8712	-1.6274	-.0207
-.1341	.0710	.0375	-.1320	-.0326	-.0953	.1551	-.2021
.2263	-.2455	.0125	-.0118	-.2439	.0227	.1246	.1057
.1277	-.2160	-.2672	-.4183	.1866	-.8038	.6924	-.0220
-.0585	.0094	-.1927	.0693	.1825	.0175	.0319	-.1318
-.1304	-.4875	-.7466	-.5706	.2916	-.6080	.7993	.2367
-.3428	.1541	.3479	-.2642	-.2128	-.1029	-.1577	-.0384
.2745	.0217	.1478	-.2995	-.1948	-.1148	-.0420	-.1828
-.1233	.0188	.2456	-.0723	.0641	-.1501	-.3622	.0310
.1151	.1086	.1063	.3596	-.1385	.7193	-1.0692	-.1806
-.1421	-.5150	-.4868	-.2878	.2801	-.8279	.8105	.2578

The regression coefficients are easily found by multiplying the rows of the reciprocal matrix of table 6 by the correlation coefficients between the scores on the item qualities and the overall teaching assessments and then adding the columns with due respect to signs. The final data are found at table 7:

TABLE 7. Derivation of Regression Coefficients
from Reciprocal Matrix

	1	3	4	5	6	7	8
	.887	.066	-.041	-.195	.008	-.084	.062
	.075	1.218	.241	-.100	-.018	.045	-.248
	-.054	.278	1.876	-.062	-.064	.191	-.617
	-.236	-.108	-.058	1.584	-.192	-.107	.080
	.008	-.017	-.049	-.164	.941	-.021	.065
	-.090	.042	.156	-.094	-.022	1.566	-1.099
	.078	-.277	-.598	.083	.081	-1.306	2.837
	-.126	-.120	-.137	-.183	-.248	.025	-.028
	-.049	-.253	-.216	.147	.058	.268	-.430
	-.163	-.307	-.547	-.002	-.344	.028	-.120
	-.208	.161	-.024	.016	-.257	.585	-1.090
	-.067	.036	.019	-.066	-.016	-.048	.070
	.131	-.142	.007	-.007	-.141	.013	.070
	.080	-.135	-.167	-.261	.117	-.502	.430
	-.034	.005	-.111	.040	.105	.010	.018
	-.077	-.289	-.443	-.338	.173	-.361	.475
	-.194	.087	.197	-.150	-.120	-.058	-.089
	.168	.013	.090	-.183	-.110	-.070	-.020
	-.064	.010	.127	-.037	.033	-.078	-.138
	.053	.050	.049	.166	-.064	.332	-.498
	-.074	-.267	-.252	-.149	.145	-.429	.421
$\Sigma+$	1.480	1.966	2.762	2.036	1.661	3.043	4.540
$\Sigma-$	1.436	1.915	2.643	1.991	1.605	3.074	4.441
$ \Sigma$ check	2.916	3.881	5.405	4.027	3.266	6.127	8.981
Regression Coefficients	.044	.051	.119	.045	.056	-.031	.099

The values of the corresponding regression coefficients are seen to be:

$$\begin{array}{r}
 + 0.044, \quad + 0.051, \quad + 0.119, \quad + 0.045, \quad + 0.056, \\
 - 0.031, \quad + 0.099, \quad + 0.194, \quad + 0.080, \quad + 0.181, \\
 + 0.034, \quad - 0.018, \quad - 0.062, \quad + 0.184, \quad + 0.057, \\
 - 0.010, \quad + 0.023, \quad - 0.025, \quad + 0.055, \quad + 0.008, \quad + 0.127,
 \end{array}$$

for the twenty-one qualities under discussion. Using these values as relative weights to the individual scores, the best weighted multiple correlation with the overall teaching mark that can be expected rises to the remarkable figure of + 0.902 (a).

Before proceeding to a discussion on the relative weights to be assigned to the items on the rating scale to achieve the best multiple correlation with the overall mark for practical purposes and on a possible shortened form of the rating scale it is advisable to test the significance of the regression coefficients previously derived.

The variances and covariances of these regression coefficients are proportional to the cells of the reciprocal matrix of table 6 (82a). Their absolute values for our criterion are obtained by multiplying these cells by the factor:

$$\frac{1 - r_m^2}{N - p - 1} \quad \text{where } (r_m = \text{multiple correlation coefficient}) \\
 (N = \text{number of teachers assessed}) \\
 (p = \text{number of items on the rating scale}) \\
 = \frac{1 - .902^2}{338 - 21 - 1} = .0005946,$$

$$\begin{aligned}
 \text{(a) Best } r_m^2 &= (.044 \times .523) + (.051 \times .591) + (.119 \times .631) + (.045 \times .635) \\
 &+ (.056 \times .525) - (.031 \times .556) + (.099 \times .660) + (.194 \times .566) \\
 &+ (.080 \times .670) + (.181 \times .751) + (.084 \times .671) - (.018 \times .502) \\
 &- (.062 \times .578) + (.184 \times .625) + (.057 \times .575) - (.010 \times .593) \\
 &+ (.023 \times .567) - (.025 \times .610) + (.055 \times .518) + (.008 \times .461) \\
 &+ (.127 \times .519)
 \end{aligned}$$

$$= 0.812099$$

$$\text{whence } r_m = 0.902$$

when the standard errors of the regression coefficients are the square roots of the diagonal elements. In table 8, the regression coefficients are tabulated with their calculated standard error and the question of significance answered in the fourth column.

TABLE 8. Significance of the Regression Coefficients

Item	Regression Coefficient	Standard Error	Significant?
1	.044	.032	No
3	.051	.035	No
4	.119	.040	Yes(?)
5	.045	.039	No
6	.056	.033	No
7	-.031	.041	No
8	.099	.051	No
9	.194	.036	Yes
10	.080	.044	No
11	.181	.047	Yes
12	.084	.045	No
13	-.018	.032	No
14	-.062	.039	No
15	.184	.035	Yes
16	.057	.033	No
17	-.010	.048	No
18	.023	.036	No
19	-.025	.040	No
20	.055	.031	No
21	.008	.035	No
23	.127	.039	Yes

It will be seen from this table that the five largest regression coefficients have significant values.

It will be observed that five of the twenty-one regression coefficients are negatively small and one is positively small in comparison with the remainder. The eight items with the highest values for the regression coefficients and hence, more influential in raising the best expected multiple correlation, are

1. "Has he the ability to illustrate his subject through concrete and living illustrations, and where necessary to use visual aids?" (item 9).
2. "Is he able to interest his students in his subject, to maintain such interest and to stimulate them to independent thought and action." (item 11).

3. "Has he the ability to get the best from his pupils by skilful useful questions?" (item 15)
4. "Is the quality of the material presented of value?" (item 4)
5. "To what degree is the teacher likely to prove an acceptable colleague in the staffroom?" (item 24)
6. "Does he possess the power of clear exposition?" (item 8)
7. "Can he engage his class in lively, well directed 'discussion' and/or 'co-operation'?" (item 10)
8. "Does he show evidence that he has organised his lesson well?" (item 12)

Thus it follows that the various assessors of teaching ability employed in this investigation consider that the teacher of technical subjects is more likely to be effective in his teaching when, acceptable as a mixer in the staffroom, he is able to stimulate his pupils independently to give of their best, through co-operative questioning and discussion of organised worthwhile and valuable subject material, presented in a living and practical setting.

Very rough weights for the scores on the twenty-one item qualities may be obtained by dividing the regression coefficients by .025. Rounding the figures to the nearest whole number we could reasonably expect a multiple correlation coefficient of about .9 with these weights: -

<u>Item No.</u>	<u>Brief Description</u>	<u>Weight</u>
1.	Specialist knowledge	2
3.	Meeting variation in ability	2
4.	Quality of lesson material	5
5.	Growth in subject taught	2
6.	Interests in allied subjects	2
7.	Clearness and forcefulness in speech	-1
8.	Clearness of exposition	4
9.	Lesson illustration	8
10.	Class co-operation	3
11.	Stimulating and maintaining interest	7
12.	Lesson organisation	3
13.	Sense of humour	0
14.	Teacher accessibility	-2
15.	Use of questions	7
16.	Use of blackboard	2
17.	Bearing in the class-room	0
18.	Maintaining discipline	1
19.	Attitude to work	-1
20.	Language and vocabulary	2
21.	Sense of humour	0
24.	Acceptability as a colleague	5

In an attempt to minimise the number of items on the rating scale, it may be assumed that those item

qualities which receive relatively small weights can conveniently be removed (a). It would appear that such qualities are either contained within other rated qualities or bear little contact with the overall assessment of teaching ability. However, on this hypothesis, a shortened form of the rating scale would then conveniently consist of the following item qualities: -

4. Is the quality of the material presented of value?
8. Does he possess the power of clear exposition?
9. Has he the ability to illustrate his subject through concrete and living illustrations?
10. Can he engage his class in lively, well-directed 'discussion' and/or 'co-operation'?
11. Is he able to interest his students in his subject, to maintain such interest and to stimulate them to independent thought and action?
12. Does he show evidence that he has organised his lesson well?
15. Has he the ability to get the best from his pupils by skilful useful questions?
24. To what degree is the teacher likely to prove an acceptable colleague in the staff-room?

With the item scores unweighted, the best multiple correlation with the overall teaching assessment that could be expected would be 0.862 (b).

However, if we were to weight the above eight item scores arbitrarily in relative sizes: 5,4,8,3,7,3,7,5, according to the previous weights obtained, then using the weighted sum and pooling square technique, we can expect a best multiple correlation of 0.867 (c). Thus no advantage would be served if the item scores, on the shortened rating scale confined to these eight items, were not weighted. Both multiple correlations to be expected from the shortened rating scale are a little lower than those to be expected from the scale in its original form.

a) It must be borne in mind that the exclusion of any one item would alter the values of the regression coefficients derived.

b) With the usual notation, by straight sum and pooling square

$$r_m \text{ (unweighted)} = \frac{C}{\sqrt{AB}} = \frac{5.270}{\sqrt{37.362}} = 0.862$$

c) Again, $r_m \text{ (weighted)} = \frac{27.704}{\sqrt{1025.64}} = 0.867$

Factorial Analysis

From the matrix (table 5) of inter-correlation coefficients between the various item qualities, three factors have been extracted, using the Thurstone centroid method:

TABLE 9. Unrotated Factors (Thurstone)

Item	Brief Description	Loadings		
		I	II	III
1	Teacher's theoretical subject knowledge	.583	-.183	.093
3	Ability to meet variation in pupil ability	.683	-.039	-.199
4	Quality of lesson material	.747	.254	-.063
5	Teacher growth in subject	.732	-.194	-.175
6	Teacher's knowledge in related subjects	.599	.204	.164
7	Clear, direct speech	.641	-.351	.109
8	Clearness of exposition	.760	.152	-.332
9	Use of illustrative media	.700	.144	.149
10	Class participation	.799	.194	.099
11	Stimulating interest	.843	.142	.060
12	Lesson organisation	.766	.296	-.134
13	Use of humour	.617	-.165	-.153
14	Class bonds	.756	.043	.099
15	Use of questions	.646	-.244	-.092
16	Use of blackboard	.658	.052	-.139
17	Student reaction to teacher	.763	.193	.123
18.	Maintaining discipline	.683	-.227	.084
19	Attitude to Work	.756	.123	.135
20	Language command	.598	-.103	.200
21	Teacher co-operation with pupils	.557	.097	-.159
24	Acceptability as a colleague	.533	-.384	.130

Significance of Factors

Before proceeding to discuss the psychological interpretation of the factor analysis it is advisable to test the significance of those extracted. Burt (83) suggests the following approximate formula for testing

-
83. Vernon, P.E. (1945). "Notes on Statistical Methods in Common Use in Vocational and Educational Research". The Admiralty. Section IV, p. 9. para 20.

the significance of a factor as a whole.

To test the s^{th} factor, chi-squared = $\frac{1}{2} N \left\{ \left(\sum r_{is}^2 \right)^2 - \sum r_{is}^4 \right\}$

where N = no. of subjects
 s = no. of factors
 extracted,

for d.f. = $\frac{1}{2} \left\{ (n - s)^2 - (n + s) \right\}$

where n = no. of tests.

Applying this test of significance to our factor III,

$$\sum r_{i3}^2 = 0.4690 \text{ and } \sum r_{i3}^4 = 0.0208$$

whence $\chi^2 = \frac{1}{2} \times 334 \left\{ 0.4690^2 - 0.0208 \right\} = 33.26$ (a) for d.f. = 150.

Tables (84) on this test indicate that our Factor III as a whole is not satisfactory. Nevertheless Burt (83a) suggests continuing an analysis until P rises to about 0.50.

An alternative check, although very rough, is to compare the factor loadings on II and III with the S.E. of zero r . With $N = 338$, the S.E. of zero $r = .0543$, and any factor extracted is almost certainly not significant unless several of the loadings exceed .16 i.e. 3 x S.E. Actually 13 II-loadings and 6 III-loadings do exceed .16. Nevertheless, it was considered advisable to pursue a 3-factor analysis (sixteen of the III factor loadings are greater than 2 S.E. of zero r .)

Before rotating the factor axes for psychological interpretation, the factors as resolved throw into relief points which are worthy of mention. The relief is enhanced if we group the original Thurstone factors by signs, as is done in table 9.

84. Fisher, R.A. (1946). "Statistical Methods for Research Workers". Oliver and Boyd. London. Table 3. pp. 112 - 3.

a. χ^2 (2nd factor) = 96.53

83a. Ibid. Section IV p.9. para. 20.

TABLE 10. Three Factor Pattern (Unrotated Thurstone)

Group	Item	Description				Analytical concept
			I	II	III	
I	11	Stimulating interest	.84	.14	.06	P → M
	17	Student reaction to teacher bearing	.76	.19	.12	P → T
	19	Attitude to work	.76	.12	.14	T → P → M
	14	Class attachments	.76	.04	.10	P → T
	10	Use of class e.g. discussion	.80	.19	.10	P → T → M
	9	Use of illustrative media	.70	.14	.15	T → P → M
	6	Teacher width in knowledge	.60	.20	.16	M → T
II	5	Teacher growth in subject	.73	-.19	-.18	M → T
	3	Meeting variation of ability	.68	-.04	-.20	T → M → P
	15	Use of questions	.65	-.24	-.09	P → M → T
	13	Use of humour	.62	-.17	-.15	T
III	18	Maintaining discipline	.68	-.23	.08	T → P
	7	Clear speech	.64	-.35	.11	T
	20	Language command	.60	-.10	.20	T
	1	Teacher knowledge	.58	-.18	.09	T → M
	24	Acceptability as colleague	.53	-.38	.13	T
IV	12	Lesson organisation	.77	.30	-.13	M → P → T
	8	Clearness of exposition	.76	+.15	-.33	T → M → P
	4	Quality of lesson material	.75	.25	-.06	M → P
	16	Use of blackboard	.66	.05	-.14	M
	21	Teacher co-operation with pupils	.56	.10	-.16	T → P

It is important to indicate that where two items were included on the rating scale to assess the same concept, there is a remarkable agreement on the factor loadings in most cases. A typical example is provided by the P → T concept, which was served by items 14 and 17.

The unrotated factors of these two items are:

- i. item 14: .76 (I), .04 (II), .10 (III),
- ii. item 17: .76 (I), .19 (II), .12 (III)

which are so close as to indicate that they were indeed measuring the same concept. A second example is provided by the two items designed to illustrate the third-order $T \rightarrow P \rightarrow M$ concept, namely items 9 and 19. Their unrotated factor loadings are respectively,

- i. item 9: .70 (I), .14 (II), .15 (III)
- ii. item 19: .76 (I), .12 (II), .14 (III)

and indicate that they, too, were indicative of the same concept, as was intended.

Yet it is evident from the factor pattern of table 10 that items 17 and 19 have much in common. Indeed, the loadings on the 3 axes are very nearly equal and it does appear that there exists a high relationship between the reaction of the students to the teacher's bearing in the classroom and the teacher's attitude to his work (or that the various assessors in this investigation were, in effect, interpreting these items as measures of the same quality). Nevertheless, these two items were directed at measuring two different analytical concepts; item 17, the $P \rightarrow T$ concept, and item 19, the $T \rightarrow P \rightarrow M$ concept.

Thirdly, recalling that items 3 and 8 were chosen to represent the $T \rightarrow M \rightarrow P$ concept, we find their loadings on our three unrotated factors to be:

- i. item 3: .68 (I) - .04 (II) -.20 (III)
- ii. item 8: .76 (I) .15 (II) -.33 (III)

In this case the I-factor loadings are fairly close, the III loadings are the two highest negative loadings registered on this axis and the loadings on the II axis are not large. Thus it is highly probable that these two items also were measures of the same concept.

However, it is important to point out the exceptions which show that some pairs of item qualities selected to represent the same concept were not so well suited. There are, for example, marked differences between the values for the II and III factor loadings for items 18 and 21 which were chosen to designate the $T \rightarrow P$ concept. It would appear that either one or both were poor choices for the concept. Indeed, it may now be advanced that item 21 probably measures something entirely different from item 18. Whereas the former may be measuring a quality which

arises from an attitude of the teacher towards the pupils, the latter seems to measure a quality within the teacher, consequent upon the reaction of the pupils towards the teacher and possibly towards one another. A similar situation is provided by items 5 and 6, which, although planned to measure the M → T concept, yield loadings of opposite signs on both the II and III axes.

Nevertheless, it does appear from the factor pattern of table 10 that, in general, the item qualities may be taken to represent different aspects of teaching ability, for in no two cases, (other than those discussed in the previous paragraphs) are the loadings on the 3 axes comparable in size and signs.

The separation in table 10 of the factor pattern into the four groups

- a. positive loadings on II and III,
- b. negative loadings on II and III,
- c. negative loadings on II and positive loadings on III,
- d. positive loadings on II and negative loadings on III,

leads to a further discussion. The first group have, on the whole, high I-factor loadings. In fact the highest I-loading in the whole table, namely .84, is within the group. It seems, therefore, that items 6,9, 10,11,14,17,19 possibly have much in common as measures of aspects of teaching ability. Indeed, the affinity between them is explained by the presence of the 'pupil' pole in six of the seven analytical concepts which these items were measuring. Other than item 6 (which is probably misplaced, for it has a lower I loading and comparably higher II and III loadings than the others), the loadings on the II and III factors are, for this group, quite small. It is possible, therefore, that the items in this group contain a 'teaching' factor and, indeed, this interpretation will be advanced again in a later discussion when dealing with the rotated factor pattern.

The four items comprising the second group in table 10 show differences in the magnitudes of their factor loadings. Whereas items 3 and 15 have comparable I loadings, the former (designed to measure the extent to which varying abilities within the class were met) has a small negative II loading and .21 negative III factor loading, whereas the latter (designed to measure the

15.

ROTATION OF FACTOR AXES.

For convenience factors II and III were chosen the pair for first rotation. The plot of the factor loadings, Diagram 2, shows that graphically, a rotation of $37^{\circ}45'$ to be the best angle to choose, because the loadings on III for ten sets of scores (6,9,19,14,17,10,11,5,13,8) are made quite small (order is .006 or less). New loadings on II' and III' have been calculated when II is rotated through this angle.

The loadings on the new axis II' are plotted against I' at diagram 3. It is possible to choose a new axis I' which passes either through the group 4,19,10,17,9 or the group 24,13,5,7,3,15. There is very little to choose between them except that by choosing the second group, more very small loadings on II'' are obtained. The angle for this rotation, determined graphically is $17^{\circ}00'$.

Di

23
o

70

-11
-0.3

©
18

©1



The new loadings were calculated to three places of decimals but are expressed to two places of decimals only in table 11 for ease of interpretation. Very small positive and negative values are omitted from the table.

TABLE 11. Factor Pattern after Rotation

	I'	II''	III'
1	.58	.	.19
3	.70	.	- .13
4	.67	.37	- .21
5	.78	.	.
6	.50	.33	.
7	.68	.	.30
8	.75	.14	- .36
9	.61	.40	.
10	.70	.44	.
11	.76	.39	.
12	.69	.37	- .29
13	.66	.	.
14	.70	.31	.
15	.69	.	.
16	.64	.15	- .14
17	.66	.44	.
18	.69	.	.21
19	.67	.39	.
20	.56	.21	.22
21	.54	.14	- .19
24	.57	.	.34

A Psychological Interpretation of the Factors

An inspection of the rotated factor loadings (table 11) indicates a strong loading on the first or general factor for all the qualities of the rating scale used in this investigation. The values ranged from 0.50 to 0.78. These first factor loadings are best interpreted in terms of a general factor of intelligence. The interpretation is supported by consideration of both high and low loadings. Thus item 5 attempted to estimate the teacher's actual growth in the subject he was teaching. It sought to assess the development to 'real scholarship' in the subject. It yields the highest loading on factor I', namely 0.78. Further, it has very small II'' and III' factor loadings.

Similarly, the ability to stimulate and maintain interest (item 11) yields an equally high I' factor loading, namely 0.76 but in this case it is coupled with a fairly high II'' loading and a zero (or rather near zero) III' loading. Clearness in exposition (item 8), which contains a measure of the teacher's ability to reason logically and clearly in sequencing the lesson material should contain a high general factor. Its first rotated factor loading of 0.75 is the third highest of the twenty-one qualities examined.

From those item qualities which bear relatively low I' factor loadings in comparison with others, further support is given to the interpretation of factor I' as a general factor of intelligence. For example, both the items 21 and 24 attempted to measure the good relationship of the teacher first with his pupils and secondly with his colleagues. Both kinds of situations would demand that the teacher was 'intelligent', yet both were concerned more with the ability to be a good mixer than the ability to be an intellectual. It is therefore to be expected that the loadings of these items on the general factor should be lower than most of the other qualities considered. Their I' factor loadings 0.54 and 0.57, while not the lowest, are among the lowest values. The lowest I' loading is 0.50, obtained with item 6. This item was designed to assess the teacher's width in allied fields. A possible interpretation is that whereas a high general factor may be needed to pursue a deep study into a particular subject, a lower general factor aids the pursuit of a less deep nature into interests outside the main teaching subjects.

To assist the interpretation of the II'' and III' factors, the loadings on these factors have been used to group the items. Thus in table 12, the various items have been brought together which have zero or near loadings on either or both these factors.

It will be noted from table 12 that, other than those for items 3 and 20, the loadings fall into four distinct groups. None of the II' loadings is negative (a) while positive and negative loadings occur on the III' factor axis.

(a) Items 5,17,13,15 and 24 all have small negative loadings on II'. Each is less than .05, hence the loading is treated as negligible to ease the clarification of the picture in table 12.

TABLE 12. Grouped Rotated Factor Pattern

Group	Item	I'	II''	III'	Brief Description of "ability"
I	5.	.78	.	.	Teacher growth in subject taught
	15.	.69	.	.	Use of questions
	13.	.66	.	.	Use of humour
II	11.	.76	.39	.	Stimulating interest
	10.	.70	.44	.	Class co-operation e.g. discussion
	14.	.70	.31	.	Class attachments
	17.	.66	.44	.	Student reaction to teacher bearing
	9.	.61	.40	.	Use of illustrative media
	19.	.67	.39	.	Teacher's attitude to work
	6.	.50	.33	.	Teacher width in <u>allied</u> subjects
III	18.	.69	.	.21	Maintenance of Discipline
	7.	.68	.	.30	Mechanics of Speech, i.e. clear, direct.
	24.	.57	.	.34	Acceptability as a colleague
	1.	.58	.	.19	Teacher knowledge of subject taught.
	3.	.70	.	-.13	Ability to meet pupil variation in ability.
IV	20.	.56	.21	.22	Language Command
	4.	.67	.37	-.21	Quality of lesson material
	8.	.75	.14	-.36	Clearness in exposition.
	12.	.69	.37	-.29	Lesson organisation.
	16.	.64	.15	-.14	Use of black-board.
	21.	.54	.14	-.19	Teacher co-operation with pupils.

The II'' factor is strongly associated with teaching ability. Those items which have the greatest regression coefficients tend to have the highest loadings on this factor. In fact, of the eight items with the most influential weights in raising the best expected multiple correlation, we find six with loadings on this factor, of which five are among the greatest. These five are: -

		<u>II'' loading</u>
a.	'class co-operation e.g. discussion (item 10)	.44
b.	'use of illustrative media' (item 9)	.40
c.	'stimulating interest' (item 11)	.39
d.	'quality of lesson material' (item 4)	.37
e.	'lesson organisation' (item 12)	.37

The sixth, item 8 ('clearness in exposition') has a .14 factor II' loading. Other item qualities, indicating relatively high II' loadings are:

i.	'student reaction to teacher bearing' (item 17)	.44
ii.	'teacher's attitude to work' (item 19)	.39
iii.	'teacher width in allied subjects' (item 6)	.33
iv.	'class attachments' (item 14)	.31

The interpretation of the II' factor is assisted by viewing these items in terms of our analytical concepts. Beginning with the highest II'' loadings and considering those greater than 0.35, these are: -

			<u>II'' loading</u>
a.	item 10	P → T → M	.44
b.	" 17	P → T	.44
c.	" 9	T → P → M	.40
d.	" 19	T → P → M	.39
e.	" 11	P → M	.39
f.	" 4	M → P	.37
g.	" 12	M → P → T	.37

It will be seen that all of these items contain the 'P' pole, and, in general, in some relationship with the 'M' pole. Successful teaching by the teacher implies successful learning by the student. A possible interpretation of the II'' factor is that it is strongly concerned with the pupil-response aspect of teaching ability. It will therefore be termed the 'pupil-response' factor.

That this interpretation is acceptable, we may turn for support by viewing those item qualities which have zero or near zero II'' factor loadings. In the first place, items 1 and 5 which are concerned with the teacher's knowledge of the subject and not with his ability to promote pupil learning of the subject, have zero II'' loadings. Secondly,

item 7, which sought to assess the teacher's forcefulness in speech and general effectiveness as a speaker (i.e. clear and impressive rather than mumbled and hesitant) also has a zero II'' loading (a). And further, item 13 ('use of humour'), item 24 ('acceptability as a colleague') and item 18 ('maintenance of discipline') which are, in effect, concerned with human relationships within the group, all yield zero loadings on this factor. Thus it may be advanced that the 'pupil-response' factor represents an ability within teaching ability' to dispose pupils to learn.

The psychological interpretation of the III' loadings indicates that our III' factor is, in all probability, a complex factor. It appears to contain a social aspect, a verbal aspect and a teaching-mechanics aspect. Of the former we find that the highest III' loading of .34 occurs with item 24 ('acceptability as a colleague') and that item 18 ('maintenance of discipline') which is related to harmony in the social group also has a positive III' loading which, at .21, is fairly high.

The two speech items, items 7 and 20, also have comparatively high III' loadings. In fact, the former has the second highest positive loading on this factor. A verbal aspect is thus apparent.

However, certain items display negative III' loadings. Of these, 'use of blackboard', 'lesson organisation', 'clearness in exposition', 'quality of lesson material', 'ability to meet variation in pupil ability' are all concerned with the external resources of the teacher. To a certain degree, they tend to reflect the acquired characteristics, peculiar to teaching, of good teaching. That their loadings on the III' factor are negative may be due to the possibility that the acquisition of the mechanics of class-room teaching techniques is at variance with the free expression of other attributes.

Nevertheless it is of interest to compare those analytical concepts which yield positive III' loadings with

(a) However, item 20 ('sufficiency in command of language') and item 8 ('clearness in exposition') have II'' loadings of .21 and .14 respectively.

SECTION VI. Conclusion and Summary of Findings

1. Many investigators have expressed concern because of the absence of any sound technique for the objective measurement of teaching ability (pp.1 - 3).
2. A review of some of the studies which have contributed to the progress made in the technique of teacher assessment indicates that:
 - i. there has been a fair degree of overlap of teacher qualities within the various approaches,
 - ii. outside of this overlap, there has also been a marked diversity of teacher qualities within similar and different approaches,
 - iii. a considerable extension of the interpretation of the term 'teaching ability' has occurred in the past five decades (pp. 4-53, 62-67).
3. It is advanced that there is no single teaching-personality pattern and further that a teaching-personality is a dynamic functioning in the teaching situation and not the sum-total of a selected number of static personality traits divorced from that situation. (pp. 36,37,48).
4. A fresh approach to the problem of the assessment of teaching ability is suggested by extending the earlier interpretations in terms of characteristics involving the teacher-pupil relationship to embrace fifteen different relationships. These relationships, called 'analytical concepts' arise from a consideration of the dynamic bi-directional tension between the three energising poles (the teacher, the pupil and the subject) in the teaching situation. Concepts involving two poles are termed 'second-order concepts'; those involving all three are termed 'third-order concepts' (pp. 54-61).
5. A rating scale of teaching ability containing 24 item qualities and designed to assess all the concepts was completed in respect of 338 lessons given by 87 student-teachers following a technical teacher-training course. (The mean age of these subjects was 34, and the mean experience in industry and commerce eleven years). (pp. 68-78).
6. Applying correlation techniques to the data, it appears that the ability to stimulate and arouse interest has a higher contact with teaching ability than has any one of the other qualities measured (p.87).

7. The two qualities next in importance are the ability of the teacher so to engage his class as to produce pupil co-operative contributions and the ability to make the lesson material presented of value to the pupils (p.87).
8. In terms of the analytical concepts, the third-order concepts appear to be linked more strongly with teaching ability than are those of the first or second-order. (p.89).
9. Indeed, qualities of the teacher measured in isolation occupy very low rank order positions in their relation with teaching ability than do those qualities which emerge from the relationship between the teacher and the pupil, or between the teacher and the material, or between the teacher and both the material and the pupil. (p.89).
10. It would appear that the assessment of teaching ability is more related to the assessment of emerging pupil-material relationships than to the assessment of observable teacher-pupil relationships (p.90).
11. Direct teacher-pupil relationship is less linked with teaching ability than the indirect relationship obtained when the subject matter is interposed (p.90)
12. The score from the rating scale of teaching ability yields a significant correlation coefficient of 0.88 with a global assessment mark when unweighted and a significant value of 0.90 when weighted. (pp. 91-95).
13. A shortened form of the rating scale (when unweighted or weighted) yields a slightly lower correlation coefficient (pp. 96-98).
14. Item qualities selected to measure the same analytical concept give rise, in most cases, to such comparable factor loadings as to indicate that they were indeed measuring the same aspect of teaching ability (p.102).
15. There is evidence that teaching ability may be interpreted in terms of these analytical concepts and assessed through them (pp. 86-97, 103.)
16. An unrotated three-factor pattern suggests four distinct groups of teaching qualities. Of these groups, one centres around the pupil-pole, two around the teacher-pole and the fourth appears to be related to the external acquired mechanics of teaching (pp.101-104).

From a rotated three-factor pattern derived from two rotations, the scores may be interpreted in terms of:

- i. a general factor, fairly heavily loaded on all item qualities (pp. 106-107).
- ii. a 'pupil-response' factor, which is positively loaded for those abilities and qualities of the teacher which dispose the pupil to respond (pp. 109-110).
- iii. a factor on which negative loadings may be taken to represent the teacher's ability to deal effectively and efficiently with the immediate or prevailing class-room situation and on which positive loadings appear to represent the ability of the teacher to call upon teaching resources which have resulted from his past experiences (pp. 110-111). Qualities with positive loadings on this factor are, it is advanced, not at variance with qualities with negative loadings. (p. 111).

BIBLIOGRAPHY

1. Myers, A.F. (1932). "An Evaluation of Research on Teacher Preparation." J.Ed. Res., Vol. XXVI, No.3.
2. Seyfart, W.S. and Tyndal, B.S. (1934). "An Evaluation of Differences in Teaching Ability". J.Ed.Res., Vol. XXVIII.
3. Barr, A.S. (1935). "The Measurement of Teacher Ability." J.Ed.Res., Vol. XXVIII. No.8.
4. Sandiford, P., Cameron, M.A., Conway, C.B., and Lang, J.A. (1937). "Forecasting Teaching Ability." (Bulletin No. 8, Department of Educational Research), Toronto.
5. Barr, A.S. (1941). "Encyclopedia of Educational Research" - Teacher Efficiency." The Macmillan Company.
6. Skinner, W.A. (1947). "An Investigation of Factors Useful in Predicting Teaching Ability (with special reference to the teaching of Mathematics and Science)". Unpublished thesis for the M.Ed. degree of the University of Manchester.
7. Fletcher, B.A. (1948). "A Year's Work and Planning in an Area Training Organization." The Bulletin of Education. The Association of Teachers in Colleges and Departments of Education. No. 17. December.
8. Daldy, D.M. (1937). "Adaptability in a group of Teachers" J.Ed.Res., Vol. VII.
9. Cattell, R.B. (1931). "The Assessment of Teaching Ability". B.J.Ed. Psy., Vol.I, Part 1 (p.6).
10. Thomson, G.H. (1921). "A Rating Scale for Teaching Ability in Students." J.Expt.Ped., Vol.VI, No.2.
11. Strong, E.K. (Editor). (1920). "The Army Personnel Manual." U.S.A.
12. Ruediger, W.C. and Strayer, G.D. (1910). "The Qualities of Merit in Teachers." J.Ed. Psy., No.1
13. Cattell, R.B. (1931). "The Assessment of Teaching Ability." B.J.Ed.Psy., Vol.I, Part I, pp.48-71.
14. Jenkinson, A.J. (about 1945). "An Experimental Rating Scale for Teachers in Training." (unpublished).

15. Martin, L.O. (1944). "The Prediction of Success for Students in Teacher Education." Bureau of Publications. Teachers' College. Columbia University.
16. Coy, G.L. (1930). "A Study of Various Factors which Influence the Use of the Accomplishment Quotient as a Measure of Teaching Efficiency." J.Ed.Res., Vol. XXI.
17. Matthews, L.H. (1933). "An Item Analysis of Measures of Teaching Ability." J.Ed.Res., No.33.
18. Terman, L.M. (1924). "Possibilities and Limitations of Training." J.Ed.Psy., Vol. X.
19. Kratz, H.E. (1896). "Characteristics of the best teachers as recognised by children." Ped.Sem., Vol.III.
20. Book, W.F. (1905). "The High School Teacher from the Pupil's Point of View." Ped.Sem. September.
21. Bird, G.E. (1917). "Pupil's Estimates of Teachers". J.Ed.Psy. Vol. VIII.
22. Butsch, R.L.C. (1931). "Teacher Rating". Rev.Ed.Res, Vol.I, No.2.
23. Robinson, W.M. (1924). "Teachers as the Pupils See Them." School Life. Vol. 10. No.42.
24. Hanthorn, A. (1930). "My Best Teacher". American Childhood. No.15.
25. Davis, H.M. (1934). "The Use of State High School Examinations as an Instrument for Judging the Work of Teachers." Contributions to Education, No. 611.
26. Hart, J.W. (compiler) (1934). "Teachers and Teachings". Macmillan Co. N.Y.
27. Torgerson, T.L. (1937). "The Measurement and Prediction of Teaching Ability". Rev.Ed.Res., Vol. VII, No.3.
28. Boardman, C.W. (1928). "Professional Tests as Measures of Teaching Efficiency in High Schools." Contributions to Education. No. 327. N.Y. (Teacher College, Columbia University).
29. Engelhart, M.D. and Tucker, L.R. (1936). "Traits Related to Good and Poor Teachers." School Review, No.4.

30. Eells, K.W. (1938). "A Scale for Evaluation of Pupils' Judgments of Best-liked and Least-liked Aspects of Secondary Schools." J.Ed.Res., Vol. XXXI. No.5.
31. Armstrong, C., Beall, H., and Wissink, G.H.(1944). "Criteria for Ranking the Faculty of a Teachers' College." Peabody Journal of Education. Vol. 21, No.6.
32. Hildreth, G.W. (1938). "Co-operative Project in Teacher-Training Supervision". Educational Administration and Supervision, Vol.24.
33. Copper, F.R. (1938). "What is Good Teaching?" Education, No. 56.
34. Broening, A.M. (1939). "General Methods of Teaching." Rev.Ed.Res, Vol. IX. No. 3.
35. Littler, S. (1914). "Causes of Failure among Elementary School Teachers". School and Home Education. March.
36. Moses, - (1914). School and Education.
37. Buellesfield, - (1915). "Causes of Failure Among Teachers." Educational Administration and Supervision September.
38. Barr, A.S. (1929). "Characteristic Differences in the Teaching Performance of Good and Poor Teachers of the Social Studies."
39. Philips, M. (1932). "Some Problems of Adjustment in the Early Years of a Teacher's Life." B.J.Ed.Psy.
40. Hoppock, R. (1935). "Comparisons of Satisfied and Dissatisfied Teachers." Ps. Bull.
41. Daldy, D.M. (1937). "Adaptability in a Group of Teachers". J.Ed.Psy., Vol. 7.
42. Dodd, M.R. (1933). "A Study of Teaching Aptitude." J.Ed.Res., Vol. XXVI, No. 7.
43. Vernon, M.D. (1941). "The Relationship of Occupation to Personality." B.J.Ed.Psy.
44. Champ, J.M. (1948). "Why Women Leave Teaching". Results of an Investigation. The Times Educational Supplement, No. 1760

46. Gregg, E.L. (1945). "As Others See Us".
Business Education World. April.
47. Sherman, H.A. (1947). The Business Education World.
June.
48. Averill, F.E. (1941). "Supervisors in their Training
of Industrial Instructors." United States Office
of Education. Washington, D.C., July.
49. Fenton, G.H. (1947). "Modern Teaching Practice and
Technique." London.
50. Synonds, F.H. (1945). "Evaluation of Teacher
Personality." Teachers College Record.
51. Linton, G. (1928). "A Study of Some Problems Arising
in the Admission of Students as Candidates for
Professional Degrees in Education." Contributions
to Education. No. 255.
52. Schrie, A.L. (1928). "Problems in Teacher Training."
Proceedings of the 1928 Spring Conference Conducted
by the Normal School and Teachers College Section
of the New York Society for the Experimental Study
of Education. Vol. I.
53. Barr, A.S. and Douglas, L. (1934). "The Pre-Training
Selection of Teachers." A.S.Rev. October.
54. Troyer, W.E. (1933). "Selection of Students for the
Profession of Teaching." A.S.Rev., No. 33.
55. Sanford, C.V. (1941). Encyclopedia of Educational
Research. Teacher Education - 7. Preservice Selection.
56. Cooper, S. (1941). Encyclopedia of Educational
Research. (Quoted from a typewritten report, State
Education Department of the University of the State
of New York).
57. Turner, I.S. (1942). "The Training of Teachers in
Australia." Australian Council for Educational
Research. Melbourne University Press.
58. Smythson, A.R. (1944). "Six points to consider in
Selecting Teachers." Nations Schools. No. 37.
59. Cytas, A.M.E., and others (1945). "The Selection of
Non-Graduate Students for Training College Courses."
Association of Teachers in Colleges and Departments
of Education.

60. Charters, W.W. and Wafles, D. (1921). "The Commonwealth Teacher-Training Study." University of Chicago Press.
61. Stanforth, A.T. (1937). "Supervision and the Teacher." American School Board Journal. Vol. 95, No. 18.
62. Meriam, J.A. (1906). "Normal School Education and Efficiency in Teaching. Quoted by Sandiford (see 4).
63. Pinsent, A. (1933). "Pre-college Teaching Experience and other Factors in the Teaching Success of University Students." B.J.Ed.Psy., Vol. III.
64. Turnbull, G.H. (1934). "The Influence of Previous Teaching Experience on Results." B.J.Ed.Psy., Vol. IV, No. 1.
65. Panton, J.H. (1934). "The Assessment of Teaching Ability with special reference to men students in training." M.A. thesis lodged in the University of London library.
66. Lawton, J.A. (1939). "A Study of Factors Useful in Choosing Candidates for the Teaching Profession." B.J.Ed.Psy.
67. Bigelow, K.W. (1939). Publication of the National Society for the Study of Education. Vol. XXXVIII. Part II.
68. Boardman, J.H. "Practical School Method." The Normal Press, London.
69. Creasy, C.H. (1935). "Technical Teaching in Theory and Practice." London.
70. - - - (1944). "Teachers and Youth Leaders". H.M.S.O., London.
71. - - - (1946). "Training of Teachers." - Scottish Education Department. Cmd. 6723. H.M.S.O.
72. Ratcliff, A.J.J. (1945). "The Adult Class - an Outline of Teaching Practice". Nelson and Sons. London.
73. Panton, J.H. (1947). "Modern Teaching Practice and Technique. London.
74. Nunn, P. (1931). "Education: Its Data and First Principles London. 2nd Edition.
75. Haggerty, M.E. (1932). "The Crux of the Teaching Prognosis Problem." School and Society. Vol. XXV, No.904 (April).

76. Nuttin, J. (1947) "Respective effectiveness of success and task-tension in learning." B.J.Psy., Vol. XXXVIII, Part 2.
77. Goulden, C.H. (1939). "Methods of Statistical Analysis." London.
78. Chambers, E.G. (1946). "Statistical Calculations." Cambridge University Press.
79. Rugg, H.O. (1921 and 1922). "Is the Rating of Human Character Practicable?" J.Ed.Psy., Vol.XII and Vol. XIII.
80. Murray, H.A. and others. (1938). "Explorations in Personality." N.Y., O.U.P.
81. Timpany, N. (1947). "Assessment for foremanship." B.J.Psy., Vol. XXXVIII, Part 1.
82. Thomson, G.H. (1946). "The Factorial analysis of Human Ability". University of London Press.
83. Vernon, P.E. (1945). "Notes on Statistical Methods in Common Use in Vocational and Educational Research." The Admiralty.
84. Fisher, R.A. (1946). "Statistical Methods for Research Workers." Oliver and Boyd. London.
85. Cohen, M.R. and Nagel, E. (1939). "An Introduction to Logic and Scientific Method." Routledge, London. (Abridged edition).

Table 2 b

Classification by Anal

Investigator	T	T → P	T → M	T → P → M
Kuediger and Strayer (1910)	initiative personality follows suggestions experience health	keeping order accord social factor appearance	studiousness	
Thomson (1921)	voice manner			illustration care in preparation
Cattell (1931)	intelligence alertness health presence personality and will	self-control social fitness humour kindliness open- mindedness tact orderliness	idealism knowledge of subject conservatism	
Martin (1944)	voice and mechanics of speech use of English ethical standards physical and mental health	personal impression knowing and under- standing the pupil	special abilities mental habits compre- hension of objectives	
Jenkinson		interest in children ready to meet extremes in ability	willingness to teach subjects other than specialist	adaptability in technique etc.

T → M → P

P

logical
explanation,
logical
questioningenthusiasm
perseverance
enterpriseability to
apply
knowledge
to childrenadaptation
to
individual
differences