CORRELATION OF MARKS IN GENERAL AND SPECIAL METHODS WITH MARKS IN STUDENT TEACHING

by

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I. INTRODUCTION

A. Statement of the Problem

For several years teacher-training institutions have been placing more and more emphasis on well-taught theory courses in the training of teachers. This course of training, the purpose of which was to increase the efficiency of the teacher and eliminate wastefulness of the trial-and-error methods, was in line with similar efforts in all other professions and industries. For many years people thought that all that was necessary to make a good teacher was knowledge of the subject-matter and the ability to maintain discipline. The trial-and-error method of finding the best teaching methods was used. The increased efficiency in modern business methods had something to do with the demand for increased efficiency in teaching. In the development of modern machinery theory always preceded the machine. Following this plan our educational leaders placed on the programs of our teacher-training instiutions a course in the principles of teaching. In addition to this course in general principles special methods courses for each department were added. An additional step was taken when student teaching was added to the curriculum. This new addition was made so that the prospective teacher would have a chance to put into practice, under the guidance of skilled teachers, the theories he had learned in the theory courses.

This investigation attempts to show the relationship between success in the acquisition of the theory of teaching as shown by marks given by the teachers of theory courses and success in student teaching as shown by marks given by the director of student teaching and the critic teachers. This investigation was made in student teaching of English, science, mathematics, physical education, social studies, home economics, music, commerce, and industrial arts. In addition, the relationships between all marks in theory and all first-term marks in student teaching, between all marks in theory and all marks in second-term student teaching, and between all marks in theory and all marks in first- and second-term student teaching were found.

B. Review of Previous Studies

The writer was unable to find studies similar to this one, but there are several studies that might be of interest to the reader in comparing correlations with the correlations found in this investigation.

One of the most closely related studies was that made by Pyle[1] in the Detroit Teachers' College. He found the following correlations:

Between intelligence and first-year teaching success, r was .034, PE$_r$.066.

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[1] W. H. Pyle, "The Relation Between Intelligence and Teaching Success," Educational Administration and Supervision, XIII (1927), pp. 433-448.

Between intelligence and second-year teaching success, r was .023, PE ±.066.

Between "Practice III" and second-year teaching success, r was .146, PE±.065.

In the above case, teaching success was determined by the marks given by the principals of the schools in which the teachers taught. This investigation shows a very low correlation between intelligence and teaching success. Another part of the study shows a correlation of .153, PE±.035 between intelligence and student-teaching marks.

According to these results, neither the intelligence of Teachers' College students nor their student-teaching success is of any considerable importance in predicting their later teaching success as graded by the principals.

In another study, one of University of Missouri students, Pyle[2] found a correlation of .52 between intelligence as shown by intelligence tests, and success in college as measured by teachers' marks. Thus a much higher degree of correlation was found between academic work in college and intelligence than was found between student teaching and intelligence.

In a study of the teaching success of several normal school graduates, when success was measured by the fifth

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[2] W. H. Pyle, "Relation of Ability to Achievement," School and Society, XXI (1925), pp. 406-408.

year's salary and professional training, Moody[3] found a correlation ranging from .25 to .38.

Neel and Mead,[4] in a study of data compiled from the records of Ohio Wesleyan University, found a correlation of .369 between the general scholastic average and student teaching. Between percentile rank (mental ability) and student teaching there was a correlation of .141 and between achievement in subject-matter and student teaching, a correlation of .486.

An experiment to show the value of theory in practice was worked out by Judd.[5] In this experiment the boys who had been taught theory adapted themselves to new conditions much more rapidly than those who had not been taught theory.

C. Collection and Classification of Data

The data used in this investigation were obtained from the office of the director of student teaching and the office of the registrar of Indiana State Teachers College. It was

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[3] F. E. Moody, "Correlation of the Professional Training with the Teaching Success of Normal School Graduates," School Review, XXVI (1918), pp. 180-198.

[4] M. O. Neel and A. R. Mead, "Correlation of Certain Group Factors in Preparation of Secondary School Teachers," Educational Administration and Supervision, XVII (1931), pp. 675-676.

[5] Charles H. Judd, "The Relation of Special Training to Intelligence," Educational Review, XXXVI (1908), pp. 36-37.

necessary to get the names and student-teaching marks from the office of the director of student teaching in order to find out in which subjects the students had taken their student teaching. The names of those students who had taken two or more terms of work in some other college were not taken. Records of students taking student teaching in high school subjects were used. The marks used were those of students who had taught from 1922 to 1932 inclusive. The marking system during that time was the same. In a few instances the mark "P" was found. In such cases the "P" was given the value of "D".

The marking system during that time was the five-point letter system: A, B, C, D, F.

In tabulating the data to make the correlation tables the marks in methods were averaged according to the following system:

When there were two A's and one B, the mark A was used.

When there were two B's and one A, the mark B was used.

When there were two C's and one A, the mark C was used.

When there were one C, one B, and one A, the mark B was used.

When there were two B's and one C, the mark B was used.

When there were two C's and one B, the mark C was used.

When there were one A and one B, half the time the A was used and half the time the B was used. The same method was used in tabulating other marks of a similar nature.

II. THE CORRELATIONS

A. The Technique Used

The method of computing the correlations was the Mean Square Contingency method, developed by Professor Karl Pearson.[1] "In the contingency method relation is expressed by C, the Coefficient of Mean Square Contingency."[2] The calculation of the Coefficient of Mean Square Contingency is well illustrated by Garrett.[3]

The fundamental principle underlying the contingency method is a comparison of the frequency of association (number of cases) actually found in each cell with the frequency of association which we would expect to find in cells if the traits were completely unrelated (independent).

If there is no correlation between the two variables in our contingency table, C equals .00; if there is perfect correlation, C approaches 1.00 as a limit.

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[1] G. U. Yule, An Introduction to the Theory of Statistics (London: Charles Griffin and Co., 1927), pp. 60 ff.

[2] H. E. Garrett, Statistics in Psychology and Education (New York: Longmans, Green and Co., 1926), p. 196.

[3] Ibid., pp. 195-203.

While in general no sign is attached to C, as this coefficient simply indicates whether the two traits are associated or are independent, for interpretative purposes a minus sign may be attached to a C if an inspection of the contingency table shows that marked degrees of one trait are found with slight degrees of the other.

One disadvantage of the Contingency Method lies in the fact that C does not remain constant for the same data when the number of classes in the table is increased. The C calculated from a 3 x 3 fold classification will not ordinarily equal the C calculated from the same data arranged in a 5 x 5 fold table. Moreover, the maximum value which C can take will depend on the fineness of the classification employed. Garrett[4] gives a table worked out by Yule,[5] which shows that:

When the number of classes equals 2, C cannot exceed .707.

When the number of classes equals 3, C cannot exceed .816.

When the number of classes equals 4, C cannot exceed .866.

When the number of classes equals 5, C cannot exceed .894.

When the number of classes equals 6, C cannot exceed .913.

When the number of classes equals 7, C cannot exceed .926.

When the number of classes equals 8, C cannot exceed .935.

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[4]H. E. Garrett, Statistics in Psychology and Education (New York: Longmans, Green and Company, 1926), p. 200.

[5]G. U. Yule, An Introduction to the Theory of Statistics (London: Charles Griffin and Company, 1919), p. 66.

When the number of classes equals 9, C cannot exceed .943.

When the number of classes equals 10, C cannot exceed .949.

Yule has suggested that, in view of these facts, we restrict the use of the coefficient of Contingency to a 5 x 5 fold or finer classification.

The relation of C to r, the Product-Moment Coefficient of correlation, is of considerable importance. C may be taken as practically equivalent to r, (1) when the grouping is relatively fine, 5 x 5 fold or finer; (2) when the sample is large; (3) when we know, or are justified in assuming, that the traits which we are correlating are normally distributed. In case the first of these requirements is not fulfilled, Elderton[6] has given for "broad categories" a correction which should be used with 4 x 4 fold and less fine classifications, if C is to be compared to r. For 5 x 5 fold or finer classifications this correction is usually small, and, unless a very accurate measure is desired, it may be disregarded and C taken roughly equal to r.

"The finding of the probable error is a tedious process."[7] In lieu of the probable error another device may be used to determine the significance of the correlations

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[6]W. P. Elderton, Frequency Curves and Correlation (London: Charles and Edwin Layton, 1927), pp. 197-206.

[7]J. K. Holzinger, Statistical Methods in Education (New York: Ginn and Company, 1928), p. 278.

found.[8] C is to be considered significant only when O, which equals S-1, differs "sensibly" from

$$\frac{C-1}{N} \pm .67449 \sqrt{\frac{2C}{N}}$$

In this expression C represents the number of cells in the contingency table. This formula is used with the short method of calculating the correlation.

J. W. Jones, Dean of the Faculty and Executive Officer of Indiana State Teachers College, suggested that another method be used to determine the significance of the correlations. He suggested that we find what per cent the coefficients of correlation in these problems are of those in Yule's table in the same number of classes. (See page 7.) This method was used.

Garrett,[9] Elderton,[10] Rietz,[11] and Holzinger,[12] agree that in a contingency table of 5 x 5 fold or finer classification it is not necessary to find the correction for C.

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[8] W. P. Elderton, Frequency Curves and Correlation (London: Charles and Edwin Layton, 1927), pp. 197-206.

[9] H. E. Garrett, Statistics in Psychology and Education (New York: Longmans, Green and Company, 1926), pp. 200-201.

[10] Ibid., pp. 206.

[11] H. L. Rietz, Handbook of Mathematical Statistics (Boston: Houghton Mifflin Company, 1924), p. 136.

[12] J. K. Holzinger, Statistical Methods in Education (New York: Ginn and Co., 1928), p. 278.

In the problems in this investigation the corrections were not found because the classification was 5 x 5 fold.

B. The Correlations

1. The correlation between the marks in general and special methods in mathematics and the marks in the practice teaching of mathematics was .366. According to Yule (see page 7), it could not be greater than .894. This is 41 per cent of what it could be. This is a very low correlation and shows a small degree of relationship between the two sets of marks.

2. The correlation between the marks in general and special methods in English and the marks in the practice teaching of English was .343, only 38 per cent of what it could be.

3. The correlation between the marks in general and special methods in physical education and the marks in student teaching of physical education was .377, which is 42 per cent of what it could be.

4. The correlation between the marks in general and special methods in science and the marks in student teaching of science was .232. This is 26 per cent of what it could be.

5. The correlation between the marks in general and special methods in social studies and the marks in student teaching of social studies was .504. This correlation is 56 per cent of what it could be.

6. The correlation between the marks in general and special methods in home economics and the marks in student teaching of home economics was .400. This is 45 per cent of what is possible.

7. The correlation between the marks in general and special methods in music and the marks in student teaching of music was .308, which is 34 per cent of what it could be.

8. The correlation between the marks in general and special methods in commerce and the marks in student teaching of commerce was .406. This is 45 per cent of what it could be.

9. The correlation between the marks in general and special methods in industrial arts and the marks in student teaching of industrial arts was .360. This is 40 per cent of the highest possible correlation.

10. The correlation between the marks in general and special methods and the marks in first-term student teaching was .314. This is 35 per cent of what it could be.

11. The correlation between the marks in general and special methods and second-term student-teaching marks was .325, 36 per cent of what it could be.

12. The correlation between the marks in general and special methods and the marks in first- and second-term student teaching was .371. This is 41 per cent of what it could be.

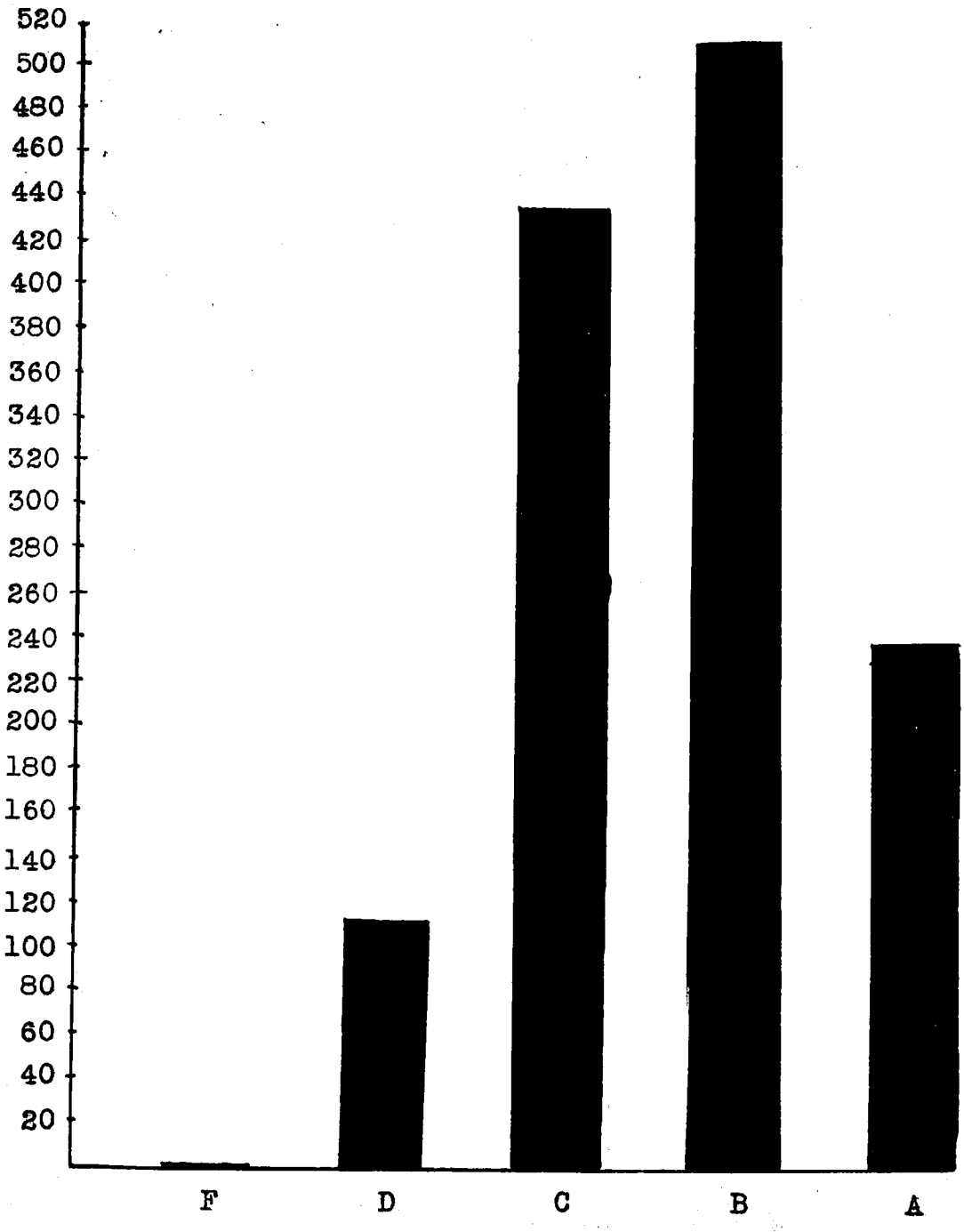

Figure 1. Distribution of marks in general and special methods.

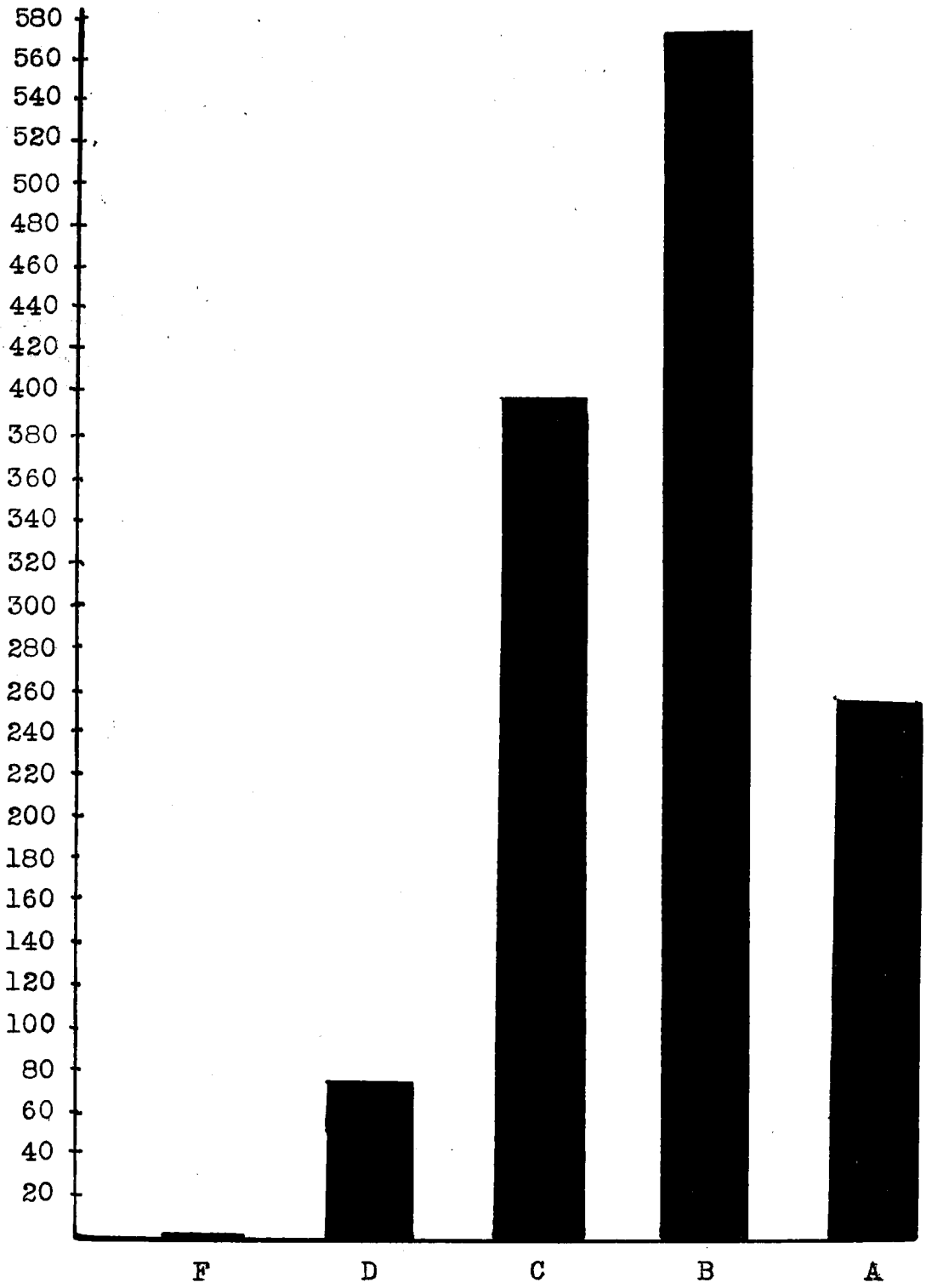

Figure 2. Distribution of marks in practice teaching.

Marks in Student Teaching of English

Marks in General and Special Methods	F	D	C	B	A	Totals
A	0	0	7	11	18	36
B	0	4	24	41	24	93
C	0	7	23	28	7	65
D	0	2	5	4	1	12
F	0	0	0	0	0	0
Totals	0	13	59	84	50	206

C = .343

Figure 3. Scatter diagram which shows relationship between marks in general and special methods in English and marks in student teaching of English.

Marks in Student Teaching of Science

Marks in General and Special Methods	F	D	C	B	A	Totals
A	0	0	5	12	8	25
B	0	5	20	39	15	79
C	0	2	25	30	10	67
D	0	0	3	3	0	6
F	0	0	0	0	0	0
Totals	0	7	53	84	33	177

C = .232

Figure 4. Scatter diagram which shows relationship between marks in general and special methods in science and marks in student teaching of science.

Marks in Student Teaching of Social Studies

Marks in General and Special Methods	F	D	C	B	A	Totals
A	0	0	2	13	18	33
B	0	2	21	45	14	82
C	1	5	23	15	3	47
D	0	2	3	2	0	7
F	0	0	0	0	0	0
Totals	1	9	49	75	35	169

C = .504

Figure 5. Scatter diagram which shows relationship between marks in general and special methods in social studies and marks in student teaching of social studies.

TABLE I

THE CORRELATIONS OF MARKS IN GENERAL AND SPECIAL METHODS WITH MARKS IN STUDENT TEACHING OF THE VARIOUS SUBJECTS

Subject	Correlation	Per Cent of Possible .894
Social Studies	.504	56
Commerce	.406	45
Home Economics	.400	45
Physical Education	.377	42
Mathematics	.366	41
Industrial Arts	.360	40
English	.343	38
Music	.308	34
Science	.232	26
First-term student-teaching marks	.314	35
Second-term student-teaching marks	.325	36
First- and second-term student-teaching marks	.371	41

III. CONCLUSION

A. Summary of Findings

1. The correlations were all low.

2. The highest degree of correlation was between social studies and student-teaching marks.

3. The lowest degree of correlation was between science and student-teaching marks.

4. The correlations ranged from .232 to .504.

5. The correlations ranged from 26 per cent to 56 per cent of what they could be.

B. Discussion of Findings

The significance of the correlations lies in the fact that the per cent of what they are to what they could be ranges from 26 per cent to 56 per cent. This means that a student has from 26 to 56 chances in 100 of making the same marks in student teaching that he made in methods. It is quite evident that the acquisition of the theory of teaching as shown by the marks received is not of considerable importance in predicting the success of the student in student teaching.

There are several causes that might account for the low degree of relationship between the two sets of marks. Every one will agree that marks given in both student teaching and method courses are more or less inaccurate. This is not the

fault of the teachers in either case. We have not found any accurate method of determining just what mark a student should have.

The bases used to determine the mark to be given are not the same in student-teaching and in method courses. In student teaching the marks are based upon many personal attributes and skill in teaching. (See page 20.) In the methods courses marks are determined by the acquisition of the theory of teaching. One course requires the acquisition of a theory; the other necessitates the presentation of a skill.

Another cause for marks for the same student differing in the two courses is the fact that he is marked by two sets of teachers who have different ideas as to what constitutes the best method of teaching. In interviewing several student teachers the writer found them almost unanimous in agreeing that methods learned in the method courses differed many times from those of the critic teachers. This is not a criticism of either the methods teacher or the critic teacher because both methods may have been equally good. The student teacher was somewhat confused by this difference and may have received a mark different from what he would have received otherwise.

Dearborn[1] has suggested that the theory courses should be taught by the critic teachers. This method would eliminate the foregoing evil and might effect a higher degree of correlation between the two sets of marks.

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[1]F. R. Dearborn, "Tentative Plan for Integrating Theory and Practice," Teachers College Journal, II (1930), pp. 17-26.

IV. APPENDIX

A. Student Rating Sheet

Student Teacher_____ Supervising Teacher_____

Date_____

PERSONAL ATTRIBUTES AND QUALITY OF WORK

	A	B	C	D	F
I. PERSONAL					
1. Health					
2. Intelligence					
3. Voice					
4. Appearance, cleanliness, grooming					
5. Self control, poise					
6. Mental alertness					
7. Resourcefulness, progressiveness					
8. Considerateness, courtesy, tact					
9. Pleasantness, cheerfulness					
10. Enthusiasm					
11. Forcefulness					
12. Adaptability					
13. Judgment					
14. Moral standards					
II. PROFESSIONAL ATTITUDE					
1. Toward the school					
2. Toward supervisors					
3. Toward conferences					
4. Toward student teaching					
5. Professional ethics					
6. Cooperation, loyalty					
7. Honesty, dependableness					
8. Industry					
9. Promptness					
10. Efforts to improve					
III. MANAGEMENT					
1. Time economies					
2. Systematic routine					
3. Attention to physical conditions					
4. Records and reports					
5. Control or discipline					
IV. PREPARATION					
1. Knowledge of subject matter					
2. Ability in special subjects					
3. Knowledge of teaching steps					
4. Ability to plan work					
5. Ability to apply principles					
6. Use of illustrative materials					
7. Use of English					

	A	B	C	D	F
V. TEACHING					
1. Definite objectives					
2. Appropriate subject matter or activities					
3. Assignment					
a. Relating to known					
b. Cooperation—pupil participation					
c. Problem statement					
d. Proper directions					
e. Adaptation to learning types					
f. Adaptation to child needs and abilities					
g. Effective motivation					
h. Enough time at the right time					
i. Pupil understanding of why, what, how					
4. Directing pupil activities					
a. Providing physical facilities					
b. Giving directions and help					
c. Developing ability or skill					
d. Developing attitudes and appreciations					
e. Developing thinking ability					
f. Taking care of pupil difficulties					
g. Encouraging creative ability					
h. Capitalizing on pupils' successes					
5. Organization					
a. Of subject matter					
b. Of activities					
6. Recitation—Effective use of:					
a. Discussion					
b. Drill					
c. Questioning					
d. Oral reports					
e. Written reports					
f. Expression through					
g. Tests					
VI. PUPIL RESULTS					
1. Increased interest					
2. Achievement					
3. Improved habits of self control					
4. Desirable social attitudes					
5. Ability to evaluate					

Remarks

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