

**THE EFFECTIVENESS OF THE DIVIDED RECITATION
SUPERVISED STUDY PERIOD IN KANSAS HIGH SCHOOLS**

by

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INTRODUCTION

Crawford (3) aptly stated: "The best gift of the school to the pupil is the ability to study." The supervised study idea evolved as an attempt to create good study habits in students and to improve poor study habits and attitudes.

Many types of supervised study are in use, each claiming superior features over the others. Among these are the Dalton and Winnetka plans, the unit plan, the contract plan, the divided recitation supervised study plan, and the laboratory studio plan.

Of these plans, the most popular in Kansas high schools is the divided recitation supervised study plan. From a survey of the high school principals' organization reports, taken from the files of the State Department of Education at Topeka, it appears that for the year 1939-40 there were 289 high schools in the state using this plan. The divided recitation supervised study plan is far more prevalent among the larger high schools than among the smaller schools. Most of the cities of the first and second class have high schools using this plan. The majority of the rural high schools use the 40 minute recitation period accompanied by 40 minute study hall periods.

Originally the divided recitation supervised study period consisted of a recitation period of 30 minutes and a study period of the same length. The study period has been gradually shortened until the most prevalent combination found was the 40-20 period. During the study period the teacher aids the pupil in preparing his work for the advanced assignment. The objective of this plan, as of all supervised study, is to teach the student how to study and how to learn.

For some time many educators in Kansas have shown dissatisfaction with the divided recitation supervised study plan as it now exists. Although aimed at developing efficient study habits among students, teachers have maintained that it creates lazy study habits and produces lack of initiative in the student. Another complaint frequently heard is that the study period is too often used for purposes other than those for which it was intended.

An examination of the literature reveals that while there is a wealth of information on supervised study, very little has been written about the divided recitation supervised study plan.

Rosenstengel and Turner (13), using the divided recitation supervised study plan, made a study in which two groups of high school students of like ability were paired. One group was taught by the supervised study method while the other was expected to make some preparation at home as well

as in study hall. From their study these men concluded that "the students would profit more by having supervised study than they would by doing homework". They found the effects, however, were temporary.

Studies on other methods of supervised study should be mentioned in order to clarify the status of supervised study in general.

Esson and Cole (5), using five pairs of high schools in experiments on the contract method of supervised study, found in four out of five cases that the pupils in the schools having supervised study showed superiority over students in schools without the contract method. A tendency was revealed in favor of the contract method. However, the statistical analyses did not show that this tendency was highly significant. It is significant that all teachers using the contract method were enthusiastic about it and its possibilities and reported that the pupils themselves favored it. How much enthusiasm was due to the novelty of the method cannot of course be stated.

In order to get the pupils' reaction to supervised study Erickson (4) submitted a series of questions to the student body of the Houghton, Michigan High School. The following results were obtained:

1. Do you consider the supervised study plan to be better than the old study hall plan? (77.7% wrote yes).
2. Do you do your best studying at home or school? (School 56.6%) (Home 43.5%).
3. Are you

doing better, about the same, or poorer work than last year? (Better 39%) (Same 44%) (Poorer 19%).

4. Do you do less, about the same, or more home study? (Less 49%) (Same 30%) (More 21%).

Gadske (7) arranged 23 pairs of freshmen high school students on the basis of intelligence quotient, arithmetic achievement, and reading achievement. One group was taught by the unit plan of supervised study while the other group was taught by the conventional method. The differences in achievement revealed a statistically significant advantage in favor of the supervised method over the general classroom method. Moreover, it seemed that a more intimate and congenial relationship was established between pupil and teacher in the supervised study method than in the group method.

An experimental study of the effect on learning of supervised and unsupervised study among college freshmen was made by Winter (14) who chose groups of 60 students from the group ranking in scholarship in the twentieth percentile or lower. Sixty others, also from the lowest fifth, were chosen from a control group. Winters concluded that "the course in 'How to Study' produced a temporary effect, but was of negligible permanent value."

Many investigators place the success of supervised study not upon any inherent merits of the plan but rather upon different external factors or circumstances. Morrison (11) said, "Does supervised study work well? In the end the effectiveness

of supervised study, like every other schoolroom method or form of method, depends on the skill, the insight, the adaptability, and beyond all else, on the industry and fidelity of the teacher."

Reavis (12) concluded that many teachers are unable to meet the demands of the divided period. "To them the study part of the period represents merely a transfer of the home-study period to the classroom, or it opens the way for another period of recitation with a double dose of home-study. In this event the aim of supervised study is defeated, for no improvement of learning or teaching is actually effected. On the contrary such disadvantages as distraction resulting from study in the classroom and monotony from too long a continued subject impose a burden which soon becomes irksome, and tend to turn supervised study into a liability rather than an asset." Hillis and Shannon (10) concluded as follows: "Supervised study is the supervision of individual pupils who are studying silently at their desks. Supervised study involves the diagnosis and correction of poor study attitudes and study habits. The teacher's duty in a natural science class is not primarily setting students to work but rather showing them how to study." Burr (2), after visiting many schools with supervised study, made the following observations:

In many of the classrooms where supervised study was used, the teacher used all of the period for recitation, or for other purposes than study. Neither

teachers nor principals seem to have worked out a technique for the best use of the study period. Often the instructor does not know whether the pupil is preparing her lesson or that of some other teacher. The recitation work in the schools with supervised study was usually poorer than the recitation work in the schools where alternate periods for reciting and study prevail. Have not the pupils been dropping more or less their personal responsibility for their lessons? If so, as at present administered, supervised study makes the pupil weaker, and thus fails as an educational procedure.

The dangers and difficulties of using supervised study without a thorough understanding of the local conditions were pointed out by Hall-Quest (9) who stated, "The fact that a certain type has succeeded somewhere is not a guaranty that it is the right one for every school." Coxe, as reported by Frederick (6), after an extended investigation of the New York schools found that while the directed study idea is accepted in most schools, in reality the common procedure has been that of employing the single textbook-recitation method. Brown and Worthington (1) in an investigation of the comparative merits of supervised study observed: "The present instruments of measure were wholly inadequate in making a definite statement as to the merits of supervised study."

From the above review it is evident that literature on the divided recitation supervised study period is very scarce and that the relative merits of supervised study over other study plans is controversial.

The purpose of this study was to determine (a) if the divided recitation supervised study plan is producing more

effective permanent study habits among high school students in Kansas, and (b) if there is justification for using the divided recitation supervised study plan as an educational procedure in Kansas.

METHOD OF INVESTIGATION

The basis of this study is a comparison of the educational achievement of two groups of college freshmen. One group was graduated from high schools using the divided recitation supervised study plan while the other group came from high schools not using the plan. Data were obtained from the State Department of Education, and from the offices of the Registrar and of Dr. J. C. Peterson who is in charge of the college aptitude tests at Kansas State College.

Before a high school may be accredited by the State Board of Education the high school principal's organization report must be filed with the high school supervisor at Topeka. From these reports data were collected on each high school in the state to determine whether the divided recitation supervised study period was used by the school. It was found that 289 high schools in the state used this supervised study in the year 1939-40. In this way all high schools in Kansas were classified as "supervised" or "unsupervised" and each college freshman studied was known to have graduated from one type of high school or the other.

From the office of the Registrar at Kansas State College data on a total of 984 college freshmen were collected for the year 1940-41. These data consisted of the name of the student, high school from which he graduated, number of college hours enrolled for, the year in which the student graduated from high school and the total number of honor points earned by him. The number of honor points earned by a student is found by multiplying the A semester hours by 3, the B by 2, the C by 1, the D by 0, the conditioned by -1 and the F by -2. Mean honor points per hour were determined by dividing semester hours into honor points. This measure is called the scholarship index or point hour ratio and is used to denote scholastic achievement.

On college entrance each freshman is given a series of aptitude tests. In this study the general college aptitude test score was used as a measure of mental ability. The percentile rank of each student on the general college aptitude test was obtained from Dr. J. C. Peterson's office.

Pairing

In order to make the study valid it was felt that the students should be paired as closely as possible on all factors affecting their scholastic attainment except supervised study. Students enrolled in the same school of the

college were always paired. Two hundred and twenty-two students were paired on the basis of the following factors: sex, year of high school graduation, college aptitude test score, size of high school from which the student graduated and the geographic location of that high school in relation of Manhattan. Percentile ranks of the students on the college aptitude test were paired within three points of each other. The school size was paired rather generally in that the small schools did not differ over one hundred in enrollment while in the large schools the enrollment might differ as much as four-hundred. Pairs were obtained from the Schools of Agriculture, Engineering and Architecture, Home Economics, and Arts and Sciences. The scholarship index for each student was listed and a mean computed for the supervised and unsupervised group in each school of the college. These means were a measure representing the scholastic attainment of the two groups. The number of pairings was greatly reduced by the factor of school size. It was therefore decided to omit this factor in a second group of pairings to obtain a larger number of cases and to determine the effect of this factor in conditioning scholastic ability.

In the treatment of the data several formulae were used. The variability within both supervised and unsupervised groups in each case was determined by computing the standard deviation of each. The raw score formula as indicated below was used.

$$\sigma = \sqrt{\frac{\sum X^2}{N} - M^2}$$

In order to determine the reliability of each mean the standard error of each mean was computed. The formula used was

$$\sigma_m = \frac{\sigma}{\sqrt{N}}$$

The correlation of the scholarship indices was measured by the use of Pearson's formula and was used to compute the standard error of the difference. Pearson's formula follows

$$r = \frac{\sum XY - NM_x M_y}{\sqrt{[\sum X^2 - NM_x^2][\sum Y^2 - NM_y^2]}}$$

The difference between the means of the two groups was determined and is a highly significant measure in this study as it indicates the difference in scholastic ability of the two groups of freshmen. To determine the reliability of this difference the following formula was used:

$$\sigma_D = \sqrt{\sigma^2 M_1 + \sigma^2 M_2 - 2r_{12} \sigma M_1 \sigma M_2}$$

The critical ratio was computed by the formula Critical Ratio = $\frac{D}{\sigma_D}$. To interpret the significance of the critical ratio a table for the evaluation of critical ratios was used.

Four hundred students were then paired for all factors mentioned for the first grouping except school size. While each student was paired with another student enrolled in the same school of the college the mean scholarship index for the entire group represents students from every school. These means were then treated statistically in the same manner as

the means for other groups.

PRESENTATION AND INTERPRETATION OF DATA

The School of Agriculture

In Table 1 are shown the results from the pairing of 46 college freshman students enrolled in the School of Agriculture paired with respect to college aptitude test scores, sex, year of graduation from high school, size of school and geographical location of school. The mean scholarship index of the supervised group was .73 while that of the unsupervised group was 1.15. The difference of .42 indicates a higher degree of scholastic attainment among the students graduating from the unsupervised schools. The statistical treatment of these data shown in Table 1 establishes the significance of the difference obtained. The standard error of the difference was .17; the critical ratio, 2.47. Garrett (8) has devised a table for determining whether an obtained difference is significant. Using this table it appears that there are 99.4 chances in 100 that the obtained difference is significant. The results in Table 1 indicate, therefore, that the students enrolled in the School of Agriculture and graduating from unsupervised high schools were scholastically superior to those students graduating from supervised high schools.

Table 1. Scholarship of matched pairs of freshman students graduating from supervised and unsupervised high schools and enrolled in the School of Agriculture. The factor of school size is recognized.

Supervised schools			Unsupervised schools		
:Percentile : :rank on col- :Scholar-: Student:lege aptitude:ship : Student:lege aptitude:ship :test :index :			:Percentile : :rank on col- :Scholar-: Student:lege aptitude:ship : Student:lege aptitude:ship :test :index :		
1	92	1.24	1	94	2.00
2	90	2.44	2	90	2.51
3	72	1.29	3	73	0.81
4	59	-0.50	4	56	0.71
5	55	1.03	5	58	1.15
6	50	1.03	6	48	0.98
7	49	0.75	7	47	1.30
8	44	1.15	8	44	1.88
9	40	1.43	9	38	1.83
10	39	0.74	10	38	2.09
11	29	0.14	11	32	0.60
12	29	2.35	12	30	1.47
13	27	-0.14	13	24	-0.78
14	23	-1.18	14	23	1.66
15	20	2.26	15	18	1.50
16	18	-0.70	16	21	1.00
17	18	0.69	17	19	2.07
18	17	0.60	18	17	1.09
19	16	0.63	19	14	1.25
20	7	0.04	20	10	0.26
21	7	0.00	21	7	1.82
22	4	0.18	22	6	-0.82
23	4	1.32	23	3	0.03
Total		16.79	Total		26.41
Mean scholarship index .73			Mean scholarship index 1.15		
Standard deviation .96			Standard deviation .84		
Standard error of mean .20			Standard error of mean .18		
Difference between means			.42		
Standard error of the difference			.17		
Critical ratio			2.47*		

* The chances are 99.4 in 100 that the difference is significant (Garrett, 8).

In pairing the students from the two groups the factor of school size greatly reduced the number of pairs available. The question arose as to the effect of school size on scholarship. Accordingly, 86 freshmen students enrolled in the School of Agriculture were paired with respect to college aptitude test score, sex and year of graduation from high school (Table 2). The factor of school size was omitted. The mean scholarship index of the supervised group was .88 while that of the unsupervised group was 1.20. The difference between the two means was .32 and the critical ratio was 2.46. Referring to Garrett (8) it was found that there are 99.4 chances in 100 that the obtained difference is significant. The evidence that the unsupervised group is superior to the supervised one is shown in Table 2. In comparing Table 1 and Table 2 it appears that the factor of school size does not materially change the results.

Table 2. Scholarship of matched pairs of freshman students graduating from supervised and unsupervised high schools and enrolled in the School of Agriculture. The factor of school size is omitted.

Supervised schools			Unsupervised schools		
Student	Percentile :rank on col- lege aptitude :test	Scholar- ship :index	Student	Percentile :rank on col- lege aptitude :test	Scholar- ship :index
1	97	2.03	1	95	1.86
2	92	1.24	2	94	2.00
3	90	2.44	3	90	2.51
4	87	2.69	4	87	2.47
5	83	1.42	5	86	2.60
6	83	1.12	6	82	2.45
7	72	1.29	7	73	0.81
8	69	2.12	8	67	2.12
9	59	-0.50	9	56	0.71
10	55	1.03	10	58	1.15
11	50	0.96	11	49	0.56
12	50	1.03	12	48	0.98
13	47	0.75	13	47	1.30
14	47	0.87	14	44	1.72
15	44	1.15	15	44	1.88
16	43	1.10	16	43	0.58
17	40	1.34	17	42	2.60
18	40	1.43	18	38	1.83
19	39	0.74	19	38	2.00
20	38	0.60	20	36	-0.10
21	37	1.26	21	38	-1.00
22	35	1.57	22	32	1.00
23	32	1.42	23	33	0.00
24	30	-0.12	24	30	1.17
25	29	0.14	25	32	0.60
26	29	2.35	26	30	1.47
27	27	-0.14	27	24	-0.78
28	26	-0.07	28	24	1.48
29	25	0.84	29	23	1.62
30	24	1.36	30	21	0.99
31	23	-1.18	31	23	1.66
32	23	-1.08	32	23	1.00
33	20	2.26	33	18	1.50
34	18	-0.70	34	21	1.00
35	17	0.26	35	20	1.18
36	18	0.69	36	19	2.07
37	18	1.40	37	18	0.90
38	17	0.60	38	17	1.90
39	16	0.63	39	14	1.25
40	7	0.18	40	10	0.26
41	7	0.00	41	7	1.82
42	4	0.18	42	6	-0.62
43	4	1.32	43	3	0.03
Total		38.02	Total		51.72

Mean scholarship index .88
 Standard deviation .92
 Standard error of mean .14

Mean scholarship index 1.20
 Standard deviation .89
 Standard error of mean .13

Difference between means .32
 Standard error of the difference .13
 Critical ratio 2.46

The School of Home Economics

In Table 3 are found the results of pairing 58 freshman students on the basis of college aptitude test scores, sex, year graduated from high school and size of high school from which the student graduated. Examination of these data shows that the mean scholarship index of the supervised is slightly higher than that of the unsupervised group. The mean of the supervised group is 1.54 while that of the unsupervised group is 1.49. The critical ratio of .50 indicates that there are only 69 chances in 100 that the obtained difference is significant. While this difference favors the supervised group it should be noted that it is not, as the critical ratio indicates, statistically significant.

An interesting fact appears when 96 students enrolled in the School of Home Economics are paired on all factors mentioned for Table 3 with the exception of school size. In Table 4 the factor of school size has apparently affected the results. The difference in the two means was .17 while the critical ratio was 1.42. This means that there are 92 chances in 100 that the obtained difference is significant. The difference in Table 4 favors the supervised group and supports the finding in Table 3. The increase in significance probably indicates that the factor of school

Table 3. Scholarship of matched pairs of freshman students graduating from supervised and unsupervised high schools and enrolled in the School of Home Economics. The factor of school size is recognized.

Supervised schools			Unsupervised schools		
:Percentile : :rank on col- :Scholar- Student:lege aptitude:ship :test :index :			:Percentile : :rank on col- :Scholar- Student:lege aptitude:ship :test :index :		
1	94	2.53	1	93	2.06
2	90	1.60	2	91	1.93
3	88	2.55	3	89	1.18
4	84	2.60	4	82	2.21
5	74	1.53	5	73	1.50
6	73	1.89	6	71	1.66
7	70	2.46	7	70	2.00
8	69	2.37	8	69	1.05
9	68	2.44	9	70	1.90
10	67	0.73	10	65	1.83
11	65	1.13	11	64	1.56
12	64	1.30	12	65	2.15
13	64	1.18	13	62	1.52
14	56	2.06	14	57	1.29
15	48	1.13	15	47	2.00
16	47	1.53	16	47	1.76
17	45	2.35	17	48	1.80
18	43	1.00	18	46	1.73
19	42	0.51	19	41	1.12
20	41	1.85	20	40	0.43
21	36	1.50	21	35	0.89
22	33	1.36	22	36	0.80
23	34	1.70	23	34	1.76
24	21	1.66	24	21	1.29
25	18	0.83	25	18	2.15
26	18	0.64	26	18	0.84
27	14	1.22	27	13	1.30
28	7	0.51	28	6	0.33
29	3	0.66	29	2	0.45
Total		44.72	Total		43.12
Mean scholarship index 1.54			Mean scholarship index 1.49		
Standard deviation .65			Standard deviation .53		
Standard error of mean .12			Standard error of mean .10		
Difference between means			.05		
Standard error of the difference			.10		
Critical ratio			.50		

Table 4. Scholarship of matched pairs of freshman students graduating from supervised and unsupervised high schools and enrolled in the School of Home Economics. The factor of school size has been omitted.

Supervised schools			:	Unsupervised schools		
Student	:Percentile :rank on col- lege aptitude: :test	:Scholar- ship :index	:	Student	:Percentile :rank on col- lege aptitude: :test	:Scholar- ship :index
1	94	2.53		1	93	2.16
2	90	1.60		2	91	1.93
3	88	2.55		3	89	1.81
4	84	1.75		4	86	2.50
5	84	2.60		5	82	2.21
6	83	2.61		6	82	0.26
7	82	2.01		7	80	1.55
8	76	2.48		8	73	1.65
9	74	1.64		9	75	1.96
10	75	1.53		10	73	1.50
11	73	2.58		11	72	0.20
12	73	1.89		12	71	1.66
13	70	2.46		13	70	2.00
14	69	2.37		14	69	1.05
15	68	2.44		15	70	1.90
16	67	0.73		16	65	1.83
17	65	1.13		17	64	1.56
18	64	1.30		18	65	2.15
19	64	1.18		19	62	1.52
20	56	2.06		20	57	1.29
21	55	1.16		21	56	1.12
22	54	2.12		22	55	0.50
23	50	0.35		23	52	1.40
24	49	1.20		24	49	1.30
25	48	1.13		25	47	2.00
26	47	1.53		26	47	1.76
27	47	2.00		27	47	1.56
28	45	2.35		28	47	1.80
29	43	1.00		29	46	1.73
30	42	0.51		30	41	1.12
31	41	1.85		31	40	0.43
32	36	1.50		32	35	0.89
33	33	1.26		33	36	0.80
34	34	1.70		34	34	1.76
35	21	1.66		35	21	1.29
36	18	0.83		36	18	2.16
37	18	0.64		37	18	0.84
38	15	0.03		38	12	-1.00
39	14	1.28		39	14	0.14
40	14	1.22		40	13	1.30
41	11	0.93		41	8	0.89
42	9	0.71		42	9	0.69
43	7	0.29		43	10	0.90
44	7	0.40		44	7	0.66
45	7	0.51		45	6	0.33
46	6	0.20		46	9	1.37
47	4	1.29		47	4	0.66
48	3	0.66		48	2	0.45
Total		69.64		Total		61.53

Mean scholarship index	1.45	Mean scholarship index	1.28
Standard deviation	.73	Standard deviation	.69
Standard error of mean	.11	Standard error of mean	.10

Difference between means	.17
Standard error of the difference	.12
Critical ratio	1.42

size affected the result and that the home economics girls did benefit from supervised study.

The School of Engineering and Architecture

In the School of Engineering and Architecture 70 freshman students were paired for all factors including that of school size. Table 5 shows that the difference in the two means of the scholarship indices is .21. The means were 1.12 and 1.33, respectively. The critical ratio of 1.50 indicates that there are 93 chances in 100 that the obtained difference is significant. Table 5 clearly shows that in the School of Engineering and Architecture the unsupervised group were superior to the supervised group in scholarship.

What are the effects of omitting the factor of school size in the School of Engineering and Architecture? In Table 6, 118 freshman students were matched, the largest group in any single school studied. The mean scholarship index for the supervised group was .92 while that of the unsupervised group was 1.11. The difference in the means of the scholarship indices was .19. Referring to Garrett (8) for interpretation it was found that there were 96 chances in 100 that the obtained difference was significant when a critical ratio of 1.73 was obtained. The superiority of the unsupervised group over the supervised group in

Table 5. Scholarship of matched pairs of freshman students graduating from supervised and unsupervised high schools and enrolled in the School of Engineering and Architecture. The factor of school size is recognized.

Supervised schools			:	Unsupervised schools		
:Percentile	:	:	:	Percentile	:	:
:rank on col-	:Scholar-	:	:	:rank on col-	:Scholar-	:
Student:lege aptitude:ship	:	Student:lege aptitude:ship	:	Student:lege aptitude:ship	:	Student:lege aptitude:ship
:test	:index	:	:	:test	:index	:
1	96	2.08		1	96	1.29
2	95	1.13		2	94	2.00
3	92	2.14		3	92	2.40
4	87	1.91		4	88	2.93
5	86	1.59		5	85	0.13
6	86	1.80		6	85	2.29
7	86	1.10		7	85	1.58
8	81	2.46		8	82	0.93
9	78	1.28		9	81	1.12
10	76	0.57		10	78	2.12
11	76	1.70		11	78	1.41
12	74	-1.61		12	72	1.30
13	68	-0.13		13	66	1.26
14	65	2.20		14	67	2.20
15	63	2.60		15	64	1.78
16	61	0.68		16	64	1.56
17	60	1.48		17	62	0.66
18	60	0.99		18	61	1.80
19	58	1.55		19	58	1.38
20	56	0.75		20	57	1.23
21	54	1.06		21	57	1.78
22	54	-0.24		22	54	1.40
23	53	0.66		23	52	1.05
24	51	2.52		24	52	1.56
25	50	1.43		25	48	1.83
26	48	0.46		26	45	1.39
27	45	0.50		27	44	0.78
28	38	0.75		28	36	1.10
29	34	1.32		29	37	0.69
30	31	0.50		30	28	0.36
31	30	1.20		31	27	1.65
32	25	0.86		32	25	0.84
33	18	0.99		33	16	0.15
34	16	-0.45		34	13	-0.40
35	10	1.36		35	11	0.93
Total		39.21		Total		46.48
Mean scholarship index	1.12			Mean scholarship index	1.33	
Standard deviation	.88			Standard deviation	.69	
Standard error of mean	.15			Standard error of mean	.11	
Difference between means		.21		Difference between means		.21
Standard error of the difference		.14		Standard error of the difference		.14
Critical ratio		1.50		Critical ratio		1.50

Table 6. Scholarship of matched pairs of freshman students graduating from supervised and unsupervised high schools and enrolled in the School of Engineering and Architecture. The factor of school size has been omitted.

Supervised schools			:	Unsupervised schools		
:Percentile	:	:	:	:Percentile	:	:
:rank on col-	:Scholar-	:	:	:rank on col-	:Scholar-	:
Student:lege aptitude:ship	: Student:lege aptitude:ship	:	:	Student:lege aptitude:ship	: Student:lege aptitude:ship	:
:test	:index	:	:	:test	:index	:
1	100	2.23	1	100	1.02	
2	100	2.56	2	100	2.65	
3	98	2.02	3	98	2.28	
4	96	2.08	4	96	1.29	
5	95	1.13	5	94	2.00	
6	95	1.03	6	93	2.94	
7	93	1.44	7	96	1.30	
8	94	2.25	8	93	0.77	
9	92	2.14	9	92	2.40	
10	91	2.61	10	92	2.40	
11	87	1.52	11	90	1.64	
12	87	1.90	12	88	2.93	
13	86	1.59	13	85	0.13	
14	86	1.80	14	85	2.29	
15	86	1.10	15	85	1.58	
16	81	2.46	16	82	0.93	
17	81	0.20	17	82	1.12	
18	78	1.28	18	81	1.12	
19	76	0.57	19	78	2.12	
20	76	1.70	20	78	1.41	
21	74	-1.61	21	72	1.30	
22	68	-0.13	22	66	1.26	
23	65	2.20	23	67	2.20	
24	63	2.60	24	64	1.78	
25	61	0.68	25	64	1.56	
26	61	0.70	26	62	0.71	
27	50	1.48	27	62	0.66	
28	60	0.99	28	61	1.80	
29	58	1.56	29	58	1.38	
30	56	0.75	30	58	1.23	
31	54	1.06	31	57	1.78	
32	54	-0.24	32	54	1.40	
33	54	-1.07	33	55	-1.80	
34	53	0.66	34	52	1.05	
35	52	0.04	35	53	0.25	
36	51	2.52	36	52	1.56	
37	50	1.59	37	50	1.06	
38	50	1.43	38	48	1.83	
39	48	0.46	39	45	1.39	
40	45	0.50	40	44	0.78	
41	42	1.11	41	42	1.71	
42	41	0.07	42	40	0.07	
43	38	-1.29	43	38	-1.14	
44	38	0.75	44	36	1.10	
45	34	1.32	45	37	0.69	
46	31	0.50	46	28	0.39	
47	30	1.20	47	27	1.65	
48	26	1.00	48	24	1.48	
49	25	0.86	49	25	0.84	
50	25	1.31	50	22	1.07	
51	22	1.06	51	20	1.40	
52	18	0.99	52	16	0.15	
53	16	-0.45	53	13	-0.40	
54	13	0.65	54	16	0.15	
55	13	-2.00	55	13	0.00	
56	10	-0.61	56	12	-1.05	
57	10	1.36	57	11	0.90	
58	4	-1.00	58	6	0.76	
59	4	-2.00	59	4	-1.43	
Total		54.63	Total		65.84	

Mean scholarship index	.92	Mean scholarship index	1.11
Standard deviation	1.12	Standard deviation	.98
Standard error of mean	.15	Standard error of mean	.13
Difference between means		.19	
Standard error of the difference		.11	
Critical ratio		1.73	

scholarship is clearly shown. The difference in school size did not greatly affect the results in this case. The difference between the means is somewhat more significant and in the same direction as observed in Table 5.

The School of Arts and Sciences

The results of pairing 48 freshman students in the School of Arts and Sciences with respect to sex, year graduated from high school, college aptitude test score and size of school are found in Table 7. While the difference in the mean scholarship indices was in favor of the supervised school it is not conclusive proof of superior scholarship. The difference between the means is .06 and the critical ratio is only .29. This indicates that there are 62 chances in 100 that the obtained difference is significant.

In Table 8, 50 freshman students enrolled in the School of Arts and Sciences were paired with respect to all factors except that of school size. The difference in the means of the two groups was .07 while the critical ratio was .50. It appears that the factor of school size did not greatly affect the results since there are only 69 chances in 100 that the obtained difference is significant. Table 8 shows that while the supervised group is slightly superior to the unsupervised group the difference is not conclusive.

Table 7. Scholarship of matched pairs of freshman students graduating from supervised and unsupervised high schools and enrolled in the School of Arts and Sciences. The factor of school size is recognized.

Supervised schools			:	Unsupervised schools		
:Percentile	:	:	:	:Percentile	:	:
:rank on col-	:Scholar-	:	:	:rank on col-	:Scholar-	:
Student:lege aptitude:ship	:Student:lege aptitude:ship	:	:	Student:lege aptitude:ship	:Student:lege aptitude:ship	:
:test	:index	:	:	:test	:index	:
1	94	2.16	1	97	1.85	
2	90	0.83	2	93	1.77	
3	90	2.15	3	91	2.64	
4	91	2.06	4	89	2.17	
5	80	1.39	5	78	0.56	
6	70	1.19	6	70	2.45	
7	67	2.65	7	68	0.62	
8	63	1.18	8	65	1.00	
9	60	1.60	9	62	2.00	
10	55	1.42	10	52	0.00	
11	38	0.76	11	35	0.48	
12	35	-1.00	12	35	1.55	
13	32	0.73	13	30	2.00	
14	29	2.00	14	26	0.74	
15	28	1.50	15	26	0.17	
16	24	0.03	16	27	2.00	
17	22	1.51	17	20	0.70	
18	14	1.13	18	12	0.60	
19	14	1.33	19	16	-0.11	
20	9	0.57	20	12	1.00	
21	11	0.34	21	9	0.44	
22	9	0.99	22	10	0.99	
23	7	-0.04	23	5	-0.89	
24	2	-0.11	24	3	0.18	
Total		26.37	Total		24.88	

Mean scholarship index	1.10	Mean scholarship index	1.04
Standard deviation	.78	Standard deviation	.69
Standard error of mean	.16	Standard error of mean	.18
Difference between means		.06	
Standard error of difference		.21	
Critical ratio		.29	

Schools of the College Combined

In three of the four schools of the college studied it was found that the factor of school size did not greatly affect the results. In the School of Home Economics it appeared that the factor of school size did change the results slightly although not conclusively. In view of this situation the question arose as to what the results would be if all schools of the college were combined. It can be suggested that this is a valid approach since each student is paired with another student enrolled in the same school of the college. The results from 400 students paired with respect to sex, college aptitude test score and year in which they were graduated from high school are presented in Table 9. It should be noted that the factor of school size has been omitted as a result of the doubt raised as to its validity as a conditioning factor in previous tables.

The mean scholarship index of the 200 supervised students shown in Table 9 was 1.03 while that of the unsupervised group was 1.09. The critical ratio was 1.00 and the difference of the means was .06. There are 84 chances in 100 that the obtained difference is significant. Table 9 indicates that students graduating from high schools using the divided recitation supervised period are lower in

scholarship in college than students graduating from high schools that do not use the supervised study plan. The study shows that the divided recitation supervised study period as carried on in Kansas high schools is not producing superior study habits of a permanent nature among the students who enter Kansas State College at Manhattan.

Table 9. Scholarship of matched pairs of freshman students graduating from supervised and unsupervised high schools and enrolled in four of the schools of Kansas State College.

Supervised schools		:	Unsupervised schools	
School of college		:	School of college	
:index		:	:index	
Arts and Sciences	42.94		Arts and Sciences	39.45
Agriculture	38.02		Agriculture	51.72
Home Economics	69.64		Home Economics	61.53
Engineering and Architecture	54.63		Engineering and Architecture	65.84
Total	205.23		Total	218.54
Mean scholarship index	1.03		Mean scholarship index	1.09
Standard deviation	.99		Standard deviation	.99
Standard error of mean	.07		Standard error of mean	.07
Difference between means			.06	
Standard error of difference			.06	
Critical ratio			1.00	

SUMMARY

1. In order to determine the effectiveness of the divided recitation supervised study period in Kansas high schools the status of supervision, scholarship records and percentile ranks on the college aptitude tests were obtained respectively from the State Department of Education, and the office of Dr. J. C. Peterson at Kansas State College.

2. These data on college freshmen enrolled for the year 1940-41 were classified according to the four schools of the college in which they were enrolled. Students graduating from high schools using the divided recitation supervised period were paired with graduates of high schools not using the supervised period. The students were paired with respect to percentile rank of college aptitude test score, sex, year of graduation from high school, size of school and geographic location of school. The mean scholarship index for each group was obtained as well as the critical ratio.

3. The mean scholarship indices and the critical ratios revealed that in the School of Agriculture and the School of Engineering and Architecture the unsupervised students were conclusively superior in scholarship. In the Schools of Home

Economics and Arts and Sciences the supervised students were slightly superior to the unsupervised students but the significance of the differences was low.

4. Pairings were made for larger groups in each school on the basis of all the conditioning factors used for the first group with the exception of school size. In the Schools of Agriculture and Engineering and Architecture the unsupervised groups were again significantly superior in scholarship to the supervised groups. In the remaining two schools the supervised students had the higher scholarship index. However the differences in favor of the supervised students were not conclusively significant. When the two sets of pairings were examined it was apparent that the factor of school size did not materially affect the results except for the students in the School of Home Economics.

5. When all of the schools of the college were combined 400 students were studied. The results indicated that the unsupervised group was superior to the supervised group in scholarship. The difference in favor of the unsupervised was not entirely conclusive.

6. The divided recitation supervised study period in Kansas high schools has failed to create permanently superior study habits among the students enrolled at Kansas State College.

7. At present considerable teacher time and taxpayers'

money may be wasted on the divided recitation supervised study plan. However, it seems possible that girls may benefit from supervised study.

8. Educators need to reevaluate the divided recitation supervised study plan. They should investigate the differences due to sex and also its effect upon different levels of intelligence.

9. It seems possible that the divided recitation supervised study plan may be a crutch that helps in high school but weakens the student for college work.

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