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ABSTRACT

In the 1971-72 IMS tryout, the first step in processing data after a teacher tests her pupils was mailing of criterion exercises to the Forms Control Center. This simple step often added significant amounts to total processing turnaround time. Comparison of delays between testing and mailing are presented for districts, schools and teachers and are made to identify problem areas and reasons for delay. Recommendations are made to avoid similar delays in the future. (SK)

SWRL SOUTHWEST REGIONAL LABORATORY
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NO: TN 5-72-49

TITLE: COMSYS 1 INTERVALS BETWEEN TESTING AND MAILING CRITERION EXERCISES IN THE 1971-72 IMS TRYOUT

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ABSTRACT

The first step in processing IMS ComSys 1 data after a teacher tests her pupils is the mailing of Criterion Exercises to SWRL's Forms Control Center. Although ostensibly a simple step, this document shows that in some situations the step added significant amounts of time to the total processing turnaround time. Comparisons of the delay days between testing and mailing Criterion Exercises are presented between districts, schools, and teachers in an attempt to identify problem areas of warranting further consideration in the IMS 1972-73 tryout.

IMS ComSys 1 was implemented in four school districts during the 1971-72 Tryout. Promptness in mailing Criterion Exercises varied greatly among school districts. Table 1 provides summary data for each school district and Figure 1 displays the frequency distribution of days-delay for each district. Only working days are counted, five days to a week. During the first 27 IMS Data Runs 128 mailings of Criterion Exercise Units were received from District 1; 65 from District 2; 22 from District 3; and 32 from District 4. Smaller frequencies in the following tables account for missing data values.

The median values provide a better basis for overall comparison between districts than the means since the means are more strongly affected by single extreme delays. Viewed in decreasing order of median days delay, (1) District 4 was worst with a median of 7.0 days delay, followed closely by (2) District 3 with a median of 6.0 delay days; (3) District 1's median was 4.0 delay days, while (4) District 2's median was a most satisfactory 1.0 days delay.

Although District 1's median is not too extreme, it should be noticed that their standard deviation is the greatest among the four school districts, owing to several extreme values inflating District 1's mean days delay above District 3's. Thus when ranked by average days delay the districts ordering changes to (1) District 4 (8.0 days delay), (2) District 1 (6.6 days delay), (3) District 3 (5.7 days delay), and (4) District 2 (1.5 days delay). The extreme delays that largely effect the increase of the means over the medians are discussed under "Promptness by Teacher".

TABLE 1

SUMMARY OF INFORMATION DESCRIBING EACH DISTRICT'S

DELAY TO MAIL CRITERION EXERCISES

SUMMARY DATA FROM RUNS 1-27	DISTRICT 1	DISTRICT 2	DISTRICT 3	DISTRICT 4
Number of Test Units Recorded	88	61	18	28
Number of Missing Values	40	4	4	4
Days Delay				
Maximum	35.0	7.0	13.0	25.0
Minimum	0.0	0.0	1.0	1.0
Range	35.0	7.0	12.0	24.0
Median	4.0	1.0	6.0	7.0
Mode	1.0	1.0	7.0	7.0
Mean	6.6	1.5	5.7	8.0
Standard Deviation	7.0	1.5	3.2	6.3
Standard Error of the Mean	0.7	0.2	0.8	1.2

For more detail comparisons between districts, Table 2 gives the actual frequency distribution over delay days; Table 3 gives the percent of measurements for each number of days delay, and Table 4 gives the cumulative percents over days. If over four days is considered unreasonable delay, it can be seen from Table 4 that only 5% of the test units received from District 2 were delayed unreasonably; 48% from District 1, 67% from District 3, and 72% from District 4. For any other similar criterion of promptness, the district's achievement can be compared easily from this table.

TABLE 2

DISTRIBUTION OF DELAY DAYS BETWEEN TESTING AND MAILING OF CRITERION EXERCISES

Number of Days Delay	FREQUENCY OF TEST UNITS BY SCHOOL DISTRICT			
	DISTRICT 1	DISTRICT 2	DISTRICT 3	DISTRICT 4
0	2	5	0	0
1	26	45	1	3
2	8	3	3	1
3	7	3	2	1
4	3	2	0	3
5	5	0	2	3
6	2	0	2	2
7	4	3	4	5
8	6	0	0	2
9	2	0	2	1
10	5	0	1	1
11	1	0	0	1
12	1	0	0	0
13	1	0	1	1
14	2	0	0	0
15	5	0	0	1
16	1	0	0	0
17	3	0	0	0

Table 2 continued.

Number of Days Delay	FREQUENCY OF TEST UNITS BY SCHOOL DISTRICT			
	DISTRICT 1	DISTRICT 2	DISTRICT 3	DISTRICT 4
18	0	0	0	0
19	0	0	0	1
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	1	0	0	0
25	0	0	0	2
26	0	0	0	0
27	0	0	0	0
28	2	0	0	0
29	0	0	0	0
30	0	0	0	0
31	0	0	0	0
32	0	0	0	0
33	0	0	0	0
34	0	0	0	0
35	1	0	0	0
Median	4.0	1.0	6.0	7.0

TABLE 3

DISTRIBUTION OF DELAYS DAYS BETWEEN TESTING AND MAILING OF CRITERION EXERCISES

Number of Days Delay	PERCENTAGE OF TEST UNITS BY SCHOOL DISTRICT			
	DISTRICT 1	DISTRICT 2	DISTRICT 3	DISTRICT 4
0	2.3%	8.2%	0.0%	0.0%
1	29.5	73.8	5.6	10.7
2	9.1	4.9	16.7	3.6
3	8.0	4.9	11.1	3.6
4	3.4	3.3	0.0	10.7
5	5.7	0.0	11.1	10.7
6	2.3	0.0	11.1	7.1
7	4.5	4.9	22.2	17.9
8	6.8	0.0	0.0	7.1
9	2.3	0.0	11.1	3.6
10	5.7	0.0	5.6	3.6
11	1.1	0.0	0.0	3.6
12	1.1	0.0	0.0	3.6
13	1.1	0.0	5.6	3.6
14	2.3	0.0	0.0	0.0
15	1.1	0.0	0.0	3.6
16	1.1	0.0	0.0	0.0
17	3.4	0.0	0.0	0.0

Table 3 continued

Number of Days Delay	PERCENTAGE OF TEST UNITS BY SCHOOL DISTRICT			
	DISTRICT 1	DISTRICT 2	DISTRICT 3	DISTRICT 4
18	0.0	0.0	0.0	0.0
19	0.0	0.0	0.0	3.6
20	0.0	0.0	0.0	0.0
21	0.0	0.0	0.0	0.0
22	0.0	0.0	0.0	0.0
23	0.0	0.0	0.0	0.0
24	1.1	0.0	0.0	0.0
25	0.0	0.0	0.0	7.1
26	0.0	0.0	0.0	0.0
27	0.0	0.0	0.0	0.0
28	2.3	0.0	0.0	0.0
29	0.0	0.0	0.0	0.0
30	0.0	0.0	0.0	0.0
31	0.0	0.0	0.0	0.0
32	0.0	0.0	0.0	0.0
33	0.0	0.0	0.0	0.0
34	0.0	0.0	0.0	0.0
35	0.0	0.0	0.0	0.0

TABLE 4

DISTRIBUTION OF DELAY DAYS BETWEEN TESTING AND MAILING OF CRITERION EXERCISES

Number of Days Delay—	CUMULATIVE PERCENTAGE OF TEST UNITS BY SCHOOL DISTRICT			
	DISTRICT 1	DISTRICT 2	DISTRICT 3	DISTRICT 4
0	2.3%	8.2%	0.0%	0.0%
1	31.8	73.8	22.2	10.7
2	40.9	86.9	22.2	14.3
3	48.9	91.8	33.3	17.9
4	52.3	95.1	33.3	28.6
5	58.0	95.1	44.4	39.3
6	60.2	*100.0	55.6	46.4
7	64.8		77.8	64.3
8	71.6		77.8	71.4
9	73.9		88.9	75.0
10	79.5		94.4	78.6
11	80.7		94.4	82.1
12	81.8		94.4	82.1
13	83.0		*100.0	85.7
14	85.2			85.7
15	90.0			89.3
16	92.0			89.3
17	95.5			89.3
18	95.5			89.3

Table 4 continued

Number of Delay Days	CUMULATIVE PERCENTAGE OF TEST UNITS BY SCHOOL DISTRICT			
	DISTRICT 1	DISTRICT 2	DISTRICT 3	DISTRICT 4
19	95.5			92.9
20	95.5			92.9
21	95.5			92.9
22	95.5			92.9
23	95.5			92.9
24	96.6			92.9
25	96.6			*100.0
26	96.6			
27	96.6			
28	98.9			
29	98.9			
30	98.9			
31	98.9			
32	98.9			
33	98.9			
34	98.0			
35	*100.0			

* For each batch of Criterion Exercises for each unit mailed to SWRL through Data Run 27 the test date was subtracted from the postmark date to determine days delay.

Promptness of Schools

To determine the effect of each school's promptness on the district averages, Table 5 compares the average days delay to mail Criterion Exercises between schools. The schools are listed within their district groupings in descending order of their average days delay and district groups are ordered similarly.

17.0 was the greatest days delay among schools, recorded from School 404 data. This is over three working weeks. School 402 averaged a delay of two working weeks; eight schools (53%) averaged over one week but less than two and only five schools (33%) averaged less than a week's delay. Those schools averaging less than a week's delay included all three schools from District 2, School 302 District 3, and School 103 of District 1.

TABLE 5

DAYS DELAY TO MAIL CRITERION EXERCISES BY SCHOOL

DISTRICT AND SCHOOL	AVERAGE DAYS DELAY TO MAIL	STANDARD DEVIATION	FREQUENCY OF TEST UNITS
DISTRICT 4			
404	17.0	13.9	3
402	10.0	7.0	2
403	7.2	4.8	15
405	6.5	2.1	2
401	5.5	1.6	6
Combined	8.04	6.33	28
DISTRICT 1			
102	7.79	7.38	48
101	6.16	7.40	25
103	3.27	3.33	15
Combined	6.56	7.00	88
DISTRICT 3			
303	8.67	5.13	3
301	6.22	2.44	9
304	6.00	0.0	1
302	3.20	2.17	5
Combined	5.77	3.25	18
DISTRICT 2			
202	3.00	2.94	10
203	2.00	1.15	4
201	1.09	0.65	47
Combined	1.46	1.50	61

Promptness of Teachers

Seeking the sources of differences in variability among schools suggests looking within schools at the differences among teachers. The teachers are considered below in decreasing order of their school district's average days delays: (1) District 4's average days delay by teacher are found in Table 6, (2) District 1's in Table 7, (3) District 3's in Table 8, and (4) District 2's in 9.

The chi-square test indicated a significant difference among the average days delay recorded for District 4's five schools; their averages ranged from 5 to 17 days delay. School 404 had the greatest average, 17.0 days delay, which upon examination is found to be totally attributable to Teacher 40402. Two of his three mailings were delayed excessively, being over two standard deviations from the district's mean of 8.04 days i.e. over 20 days! Similarly, School 402's two week average delay was found totally attributable to one teacher, 40201.

Six of the 9 teachers from School 403 mailed Criterion Exercises with an average of 7.2 days delay. Averaging over a week's delay were Teachers 40303 (14.5 days), 40301 (9.0 days), 40304 (7.7 days), and 40305 (6.7 days). Thus two-thirds of School 403 teachers mailed data delayed over a week in doing so.

School 405's average of 6.5 days delay was totally attributable to two mailings from Teacher '0501. School 401 averaged fewer days delay than the other District 4 schools, but his was still over a week being weighted by Teacher 40101 averaging 6.5 days delay and one unidentified teacher's mailing of 7.0 days delay.

The chi-square test for differences among days delayed by schools in District 1 was also significant. School 102 had the highest average in the school district, but note its 7.8 days delay was lower than District 4's average among schools of 8.0 days. Two teachers in School 102 averaged delays longer than two weeks and five averaged from one to two weeks, inclusive. They account for 7 tenths of the school's teachers mailing data. Teacher 10208's high standard deviation reflects one of the three extreme delays in the district of two standard deviations from the mean of 6.6 days, i.e over 4 weeks.

Teacher 10101 from School 101 averaged three weeks delay with one mailing delayed over four weeks. Teacher 10105 averaged over two weeks and Teacher 10103 over a week. However, Teacher 10103 was the third source of one mailing delayed over four weeks. All School 103 Teachers averaged less than one week's delay to mail Criterion Exercises.

In District 3, School 303 had the longest average delay (8.7 days), totally attributable to Teacher 30301; School 302 had the shortest average delay (3.2 days), totally attributable to Teacher 30201. Both teachers mailing data from School 301 averaged over a week's delay as did Teacher 30404 in the sole mailing from School 304.

All teachers in District 2 averaged less than four days delay, with only three of their 61 recorded mailings delayed over 4 days. Their performance need not be elaborated upon, as it appears entirely satisfactory.

It would be interesting to compare attitude data obtained from the debriefing sessions with the above to determine whether and/or what dissatisfaction rested with those who substantially delayed processing of their own data.

TABLE 6

DELAY DAYS BETWEEN TESTING AND MAILING CRITERION EXERCISES

UNITS AMONG TEACHERS IN DISTRICT 4

SCHOOL AND TEACHER	FREQUENCY OF MAILINGS	AVERAGE DAYS DELAY TO MAIL	STANDARD DEVIATION
School 404			
40402	3	17.0	13.9
40401	0	-	-
40403	0	-	-
40404	0	-	-
40405	0	-	-
40406	0	-	-
Combined	3	17.0	13.9
School 402			
40201	2	10.0	7.0
40202	0	-	-
Combined	2	10.0	7.0
School 403			
40303	2	14.5	6.4
40301	1	9.0	0.0
40304	6	7.7	2.9
40305	3	6.7	3.8
40306	2	1.5	0.7
40308	1	1.1	0.0
40302	0	-	-
40307	0	-	-
40309	0	-	-
Combined	15	7.2	4.8

School 405			
40501	2	6.5	2.1
40502	0	-	-
Combined	2	6.5	2.1
School 401			
40101	2	6.5	0.7
40103	2	4.5	2.1
40102	1	4.0	0.0
Unidentified	1	7.0	0.0
Combined	6	5.5	1.6

TABLE 7

DELAY DAYS BETWEEN TESTING AND MAILING

CRITERION EXERCISE UNITS AMONG TEACHERS

IN DISTRICT 1

SCHOOL AND TEACHER	FREQUENCY OF MAILINGS	AVERAGE DAYS DELAY	STANDARD DEVIATION
School 102			
10205	6	13.0	4.1
10210	2	12.0	2.8
10216	9	10.0	8.2
10204	7	8.7	5.3
10208	7	7.1	12.5
10206	6	6.7	6.6
10201	1	5.0	0.0
10207	3	4.3	4.9
10209	5	2.2	1.6
10202	2	1.0	0.0
10203	0	-	-
10212	0	-	-
10214	0	-	-
10215	0	-	-
Combined	48	7.8	7.4
School 101			
10101	3	15.0	11.4
10105	3	10.3	2.1
10103	4	8.5	13.0
10104	2	3.0	0.0
10102	9	2.8	2.5
10106	2	2.5	0.7
Unidentifed	2	4.0	4.2
Combined	25	6.2	7.4

Table 7 continued

School 103			
10301	8	4.1	4.1
10303	1	2.0	0.0
10302	5	1.4	0.5
Combined	15	3.3	3.3

TABLE 8

DELAY DAYS BETWEEN TESTING AND MAILING CRITERION EXERCISE UNITS AMONG TEACHERS IN DISTRICT 3

SCHOOL AND TEACHER	FREQUENCY OF MAILINGS	AVERAGE DAYS DELAY TO MAIL	STANDARD DEVIATION
School 303			
30301	3	8.7	5.1
School 301			
30101	4	7.0	0.0
30104	5	5.6	3.3
30102	0	-	-
30103	0	-	-
Combined	9	6.2	2.4
School 304			
30404	1	6.0	0.0
30501	0	-	-
30402	0	-	-
30403	0	-	-
30405	0	-	-
30406	0	-	-
Combined	1	6.0	0.0
School 302			
30201	3	8.7	5.1

TABLE 10

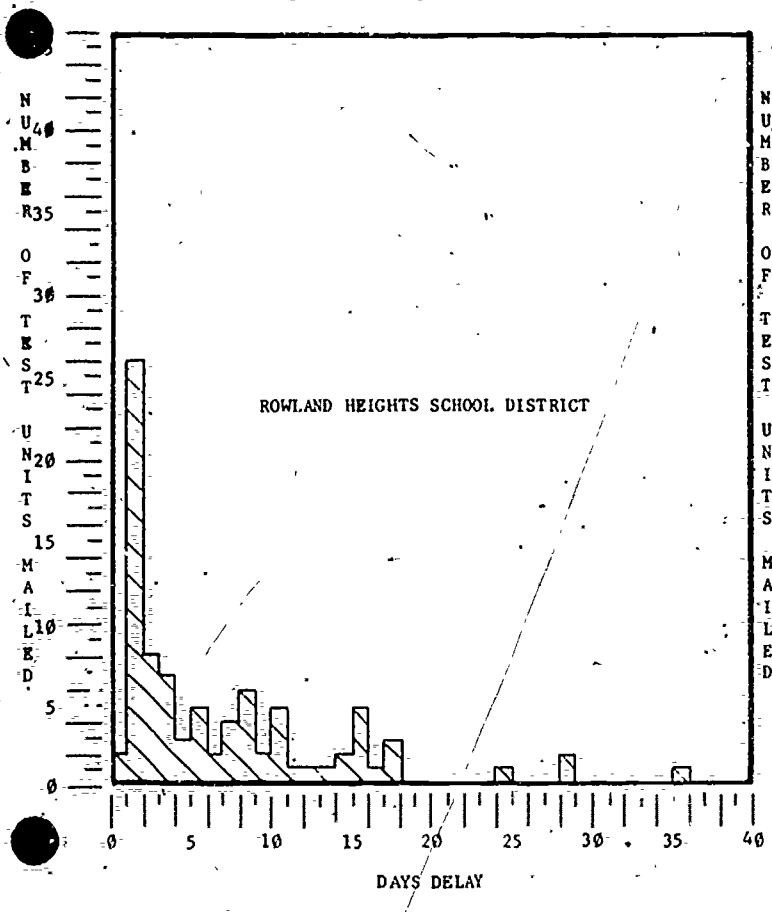
DELAY DAYS BETWEEN TESTING AND MAILING CRITERION EXERCISE UNITS AMONG TEACHER IN DISTRICT 2

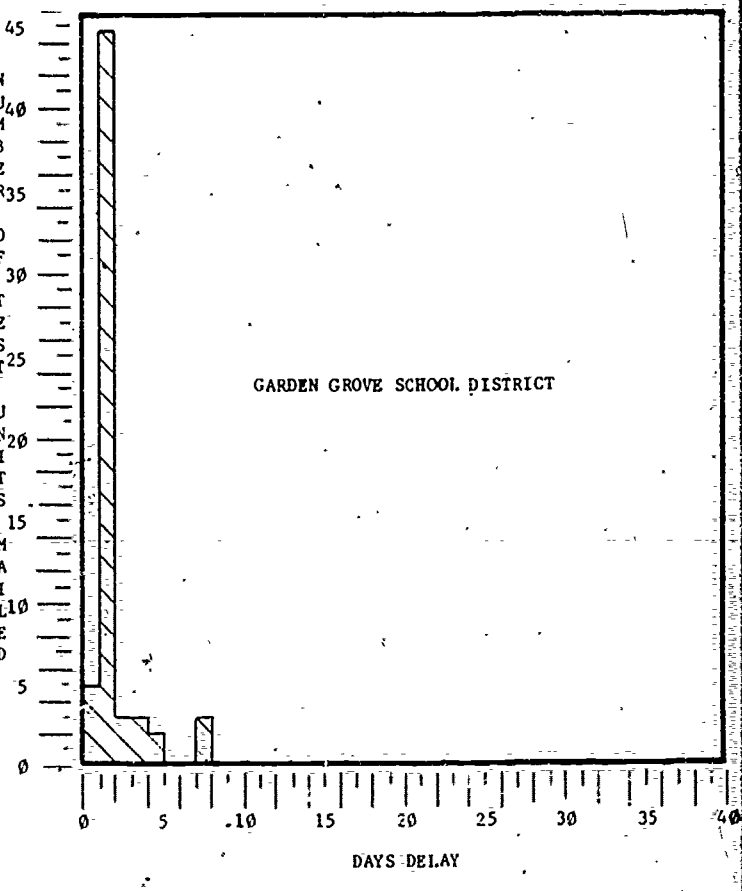
SCHOOL AND TEACHER	FREQUENCY OF MAILINGS	AVERAGE DAYS DELAY	STANDARD DEVIATION
School 202			
20201	8	3.5	3.1
20202	2	1.0	0.0
20203	0	-	-
Combined	10	3.0	2.9
School 203			
20303	2	3.0	0.0
20305	2	1.0	0.0
20302	0	-	-
20301	0	-	-
20304	0	-	-
Combined	4	2.0	1.2
School 201			
20104	4	2.0	1.6
20106	6	1.0	0.6
20107	15	1.0	0.0
20108	16	1.0	0.6
20109	6	1.0	0.0
20101	0	-	-
20102	0	-	-
20105	0	-	-
20110	0	-	-
Combined	47	1.1	0.7

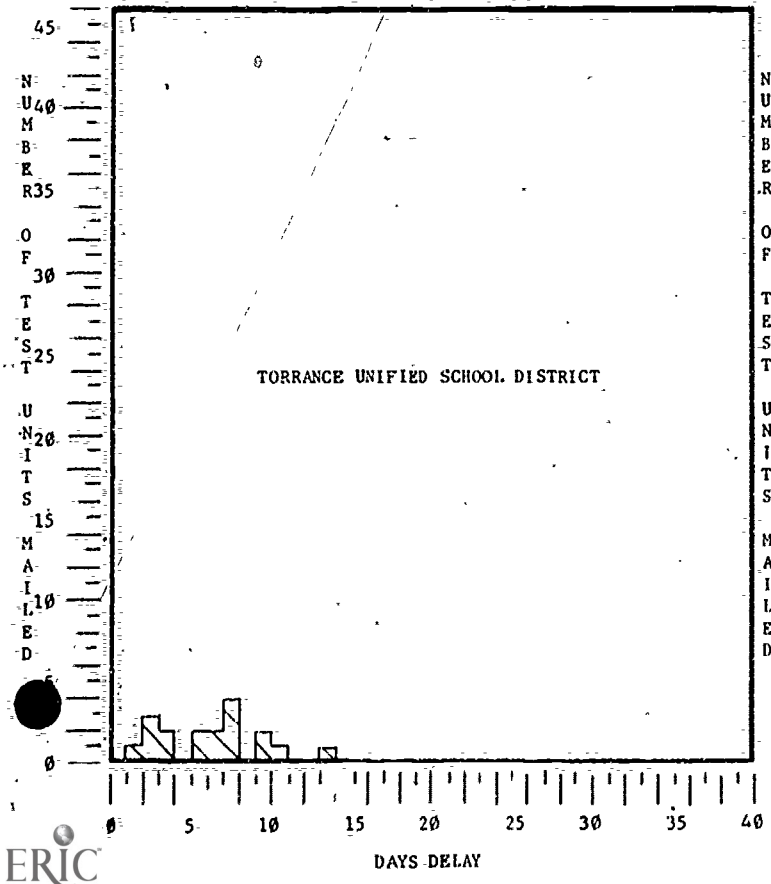
FREQUENCY DISTRIBUTION OF

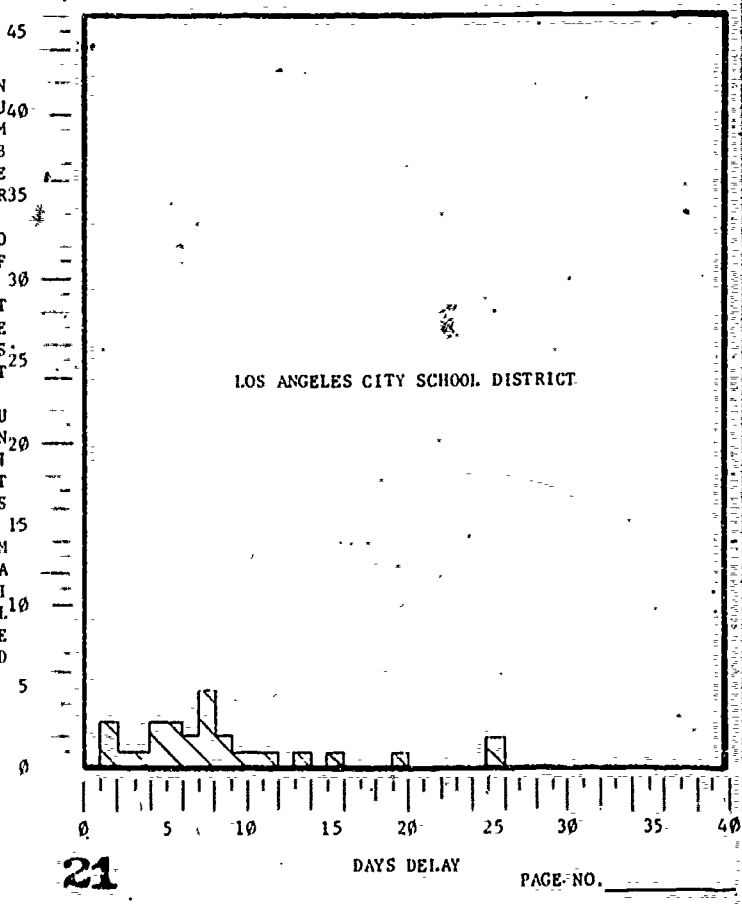
TEACHERS' DELAY TO MAIL CRITERION EXERCISES

TABLE_____









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