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ABSTRACT

The cost-effectiveness and impact on response rate of variations in mailing procedures involved in a mail survey of teacher education graduates were assessed. Variables studied were use of a preliminary or advance letter, postcard versus letter reminders as the first follow-up mailing, timing of the reminder (1 versus 2 weeks after the first mailing), use of a reminder versus no reminder prior to the mailing of the duplicate questionnaire, and timing of the mailing of duplicate questionnaires (3 versus 4 weeks following the first mailing when no reminder was sent). Subjects were 288 individuals who had completed teacher preparation programs leading to initial certification at a major institution in the Southeast from the fall quarter of 1987 through summer quarter of 1988; and 288 individuals identified through comparison of applications for certification, student teaching records, and graduation lists. Daily tabulations of returns for each experimental condition were maintained. Cost analyses covered outgoing postage; return postage; mailing labels for envelopes; letterhead stationary and envelopes; plain return envelopes; and duplication of letters, postcards, and questionnaires. Results indicate that the preliminary letters are not cost effective, while reminders and duplicate follow-up questionnaires are cost effective. Three tables and one figure are included. (TJH)

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Variations in Mail Survey Procedures: Comparison of Response Rates and Cost

When conducting surveys, a high response rate is always desirable. In many situations, however, there may be financial limitations that prevent the researcher from using techniques that have been shown to elicit the maximum number of responses. This is frequently true when the research is not financed by external sources. The methodological choices made by the researcher in designing the study are thus influenced by both the desire for a high response rate and the resources available.

Results of previous studies of survey methods are often conflicting. The use of a preliminary letter or postcard in mail surveys has been found to produce higher response rates by many researchers (Eisinger, Janicki, Stevenson, & Thompson, 1974; Ford, 1967; Heaton, 1965; Stafford, 1966; Walker & Burdick, 1977), although Parsons and Medford (1972) found it made no difference. The use of a followup has been more effective in inducing responses than preliminary letters (Kephart & Bressler, 1958), but followups are not all identical. Postcard and/or letter reminders have significantly increased returns in some studies (Hinrichs, 1975; Moss, 1981; Nichols & Meyer, 1966; Wiseman, 1973) but had only a slight effect (that was eliminated when coupled with a second questionnaire) in another (Rossman & Astin, 1974).

Timing of mailings, which varies widely, may be another variable to consider. Little research has been conducted on timing within a single study other than those studies that do or do not use a followup reminder. Researchers generally base their judgments on response patterns to more than one independent survey. Lindsay (1921) compared response rates from two studies with different timing of followups, while Nichols and Meyer (1966) used postcard reminders after three, 16 and 27 days. Cox (1966), based on several studies, recommended reducing the interval between mailings to seven days.

The objectives of the present study were to determine the cost effectiveness and impact on response rate of variations in mailing procedures in a mail survey of teacher education graduates. The variables studied were: use of a preliminary or advance letter, postcard versus letter reminder as the first followup mailing, one week versus two week timing of reminder, reminder versus no reminder prior to mailing of duplicate questionnaire; three week versus four week timing of mailing of duplicate questionnaire when no reminder was sent.

Method

Subjects

Subjects for the survey were 288 individuals who had completed teacher preparation programs leading to initial certification at a major institution in the Southeast during fall quarter 1987 through summer quarter of 1988. In the fall of 1988, a total of 288 individuals were identified through comparison of applications for certification, student teaching records, and graduation lists.

Procedure

Individuals were randomly assigned to one of two conditions: preliminary letter or no preliminary contact. The 144 individuals in each subgroup were randomly assigned to the following six conditions: postcard reminder after one week; postcard reminder after two weeks; letter reminder after one week; letter reminder after two weeks; no reminder, with duplicate questionnaire mailed after three weeks; no reminder with duplicate questionnaire mailed after four weeks. Twenty-four individuals were assigned to each of the 12 groups. The design of the study is shown in Figure 1.

Type of First Reminder	Timing	Preliminary Letter: Yes	Preliminary Letter: No
None	Duplicate questionnaire at 3 weeks	P1	N1
	Duplicate questionnaire at 4 weeks	P2	N2
Postcard	1 week, duplicate questionnaire at 3 weeks	P3	N3
	2 weeks, duplicate questionnaire at 4 weeks	P4	NP4
Letter	1 week, duplicate questionnaire at 3 weeks	P5	N5
	2 weeks, duplicate questionnaire at 4 weeks	P6	N6

Figure 1 Design of Study.

Twelve individuals were subsequently deleted from the study when it was determined that they were out of the country or mail to them was returned by the post office as undeliverable. This left 276 individuals in the study.

Preliminary letters were mailed on April 3 to those individuals in groups receiving them (P1 - P6). The preliminary letter emphasized the value of the graduate's participation and the importance of the study in improving the program for future students and in providing information for the impending accreditation evaluation by NCATE.

The questionnaire (an 8 page, 7" by 8 1/2" ivory-colored booklet) and a stamped, self-addressed return envelope were mailed one week later to all individuals. The accompanying cover letter for those who had not received the preliminary letter (N1 - N6) conveyed the same information as the advance mailing. For those who had received the preliminary letter, the cover letter restated the value of the individual's participation.

Reminders and subsequent mailings were sent only to those who had not responded. Those in the one-week reminder groups were mailed postcards (P3, N3) or letters (P5, L5) one week following the mailing of the questionnaire. Those in the two-week reminder groups were mailed identical reminders after two weeks (P4, N4, P6, N6). A duplicate copy of the questionnaire and a cover letter (but no return envelope) were sent two weeks after the reminder to all nonrespondents. This is referred to as the followup mailing. This was followed by a final reminder letter two weeks after the second questionnaire.

For those in the groups not sent reminders, the duplicate questionnaires were sent three (N1, P1) or four weeks (N2, P2) after the mailing of the original questionnaires, so that these individuals received their replacement questionnaires at the same time as those individuals who had been sent reminder postcards or letters. Two weeks after the duplicate questionnaire was sent, a final reminder letter was sent to nonrespondents. All mailings were sent first class (metered) except the postcards.

Analysis

Daily tabulations of returns for each condition were maintained. Because it would be impossible for a participant to receive a reminder and return the questionnaire in less than two days following mailing of the reminder, responses for each mailing were calculated for each condition by determining the number received through the day following the subsequent mailing.

Cost per response per condition included the following costs: outgoing postage; return postage; duplication of letters, postcards, and questionnaires; mailing labels for envelopes; letterhead stationary and envelopes; and plain return envelopes. The costs used are presented in Table 1. Labor costs of designing questionnaires, hand signing of letters, and stuffing envelopes were not included. The cost per return was determined by dividing the total cost

involved for mailings in a condition (total of costs calculated for the actual numbers of nonrespondents in the group for each mailing from preliminary letter through final reminder) by the final number of respondents in the group.

Table 1

Base Costs

Item	Cost Per Unit
Outgoing postage (university rate, first class, metered) for preliminary letters; questionnaires, cover letters & return envelopes; final follow-up letters	$ .21
Return postage	$ .25
Stamps for postcards	$ .15
Mailing labels	$ .00176
#9 Return Envelopes	$ .0112
Letterhead envelopes for outgoing mail	$ .02395
Letterhead stationery	$ .0215
Duplication of single-page letters	$ .0275
Questionnaires (paper + duplication)	$ .11
Duplication of postcards (message on plain card stock, then cut)	$ .025

Overall response rates and cost per response were calculated for each of the 12 conditions were calculated. (Because much of the previous research was conducted without benefit of followup mailings or with only a reminder after the initial mailing, response rates and costs were also calculated up to the point of sending the followup that contained the duplicate questionnaire.) Chi-square analyses ($p < .05$) were used when observable differences in response rates between groups were potentially significant.

Results

Response Rates

A total of 177 questionnaires were returned within two weeks of the final mailing for a return rate of 64%. Returns for the 12 subgroups ranged from 47.8% to 80.9%, as shown in Table 2.

Table 2

Final Response Rate and Cost by Condition

Condition	n	Respon-dents	Return Rate	Cost per Return
No preliminary letter				
N1 Duplicate at 3 weeks	24	17	70.8%	$1.42
N2 Duplicate at 4 weeks	23	11	47.8%	$2.62
N3 Postcard reminder at 1 week	24	13	54.2%	$2.28
N4 Postcard reminder at 2 weeks	23	17	73.9%	$1.56
N5 Letter reminder at 1 week	21	17	80.9%	$2.01
N6 Letter reminder at 2 weeks	23	14	60.9%	$2.31
Preliminary letter				
P1 Duplicate at 3 weeks	23	15	65.2%	$2.14
P2 Duplicate at 4 weeks	24	12	50.0%	$2.80
P3 Postcard reminder at 1 week	23	18	78.3%	$1.92
P4 Postcard reminder at 2 weeks	24	15	62.5%	$2.33
P5 Letter reminder at 1 week	22	11	50.0%	$3.70
P6 Letter reminder at 2 weeks	22	17	77.3%	$2.11
No preliminary letter (N1-N6)	138	89	64.5%	$1.97
Preliminary letter (P1-P6)	138	88	64.1%	$2.41
Postcard reminder (N3, N4, P3, P4)	94	63	67.0%	$1.99
Letter reminder (N5, N6, P5, P6)	88	59	67.0%	$2.43
One week reminder (N3, N5, P3, P5)	90	59	65.6%	$2.36
Two week reminder (N4, N6, P4, P6)	92	63	68.5%	$2.06
No reminder (N1, N2, P1, P2)	94	55	58.5%	$2.16
Reminder (N3-N6, P3-P6)	182	122	67.3%	$2.20
No reminder:				
Duplicate at three weeks (N1, P1)	47	32	68.1%[a]	$1.76
Duplicate at four weeks (N2, P2)	47	23	48.9%	$2.71
Preliminary letter, no reminder (P1, P2)	47	27	57.4%	$2.43
No preliminary, reminder (N3, N4, N5, N6)	91	61	67.0%	$2.01

[a] $X^2 = 3.55$, $p = .0596$

The group with the highest response rate and the group with the lowest cost per return were both among those not sent preliminary letters. The highest response rate (80.9%) was found from group N5, whose procedures included a letter reminder after one week. The lowest cost per return was $1.42 (group N1), which resulted from sending the followup with a duplicate questionnaire after three weeks without benefit of an intermediate reminder.

While the first three paired comparisons showed little actual difference in response rate, there were noticeable differences in cost per response favoring omission of a preliminary letter, using postcards for reminders,

and sending reminders after two weeks. Sending a reminder of either type added little to the cost per response but improved the response rate by 8.8%. When no reminder was sent, both cost and response rate were improved considerably by sending the followup after three weeks rather than four. Finally, it was more effective and less costly to send a reminder than a preliminary letter. There were no statistically significant differences ($p < .05$) when chi-square comparisons were applied to response rates in the latter three pairs of conditions. Even if a more liberal significance level ($p < .10$) had been used, only one condition would have shown significant impact.

Discussion and Implications

Results of this study indicate that when surveying a homogeneous group, such as alumni, response rate is not improved by sending a preliminary letter and serves only to increase the cost per response. The resources devoted to preliminary letters would be better utilized by sending a reminder. In general, postcard reminders were less costly but just as effective in inducing returns as letters. In deciding whether or not to send a reminder, the researcher must consider that the small increase in cost per return (when sending a reminder) produced a noticeable gain in response rate. A similar high response rate was attained at a noticeably lower cost per return by eliminating the reminder and sending a followup with a duplicate questionnaire after three weeks If reminders are used, sending them after two weeks was slightly more effective and less expensive than those sent after one week, as recommended by Cox (1966). A time lapse of one week after the first mailing, regardless of whether it be the advance letter or the questionnaire, does not always allow sufficient time for returns by the post office if the previous letter was undeliverable. This can result in multiple mailings to an obsolete address, adding to the cost per response.

For economy, sending a second questionnaire after three weeks without a previous reminder and without a preliminary letter would appear to provide the best method. If, however, return rate alone were the main consideration, sending a letter reminder one week after the mailing of the questionnaire would be inserted into the model. The five approaches with the lowest cost were also the five approaches with the highest response rates, although the rank orders were not identical. Therefore, it would be at the discretion of the researcher to balance the two pieces of information and choose the most appropriate methods. If a preliminary letter were used, sending a postcard reminder after one week would be the most advantageous in terms of both response rate and cost per return.

Both response rate and cost must be considered when making decisions about procedures. The present study was limited because of the small sizes of the groups and because the survey was directed toward a homogeneous

population. In addition, the researcher also imposed certain limitations (the number and types of reminders and follow-up mailings). Other researchers may end their efforts without sending reminders, without sending duplicate questionnaires, and/or without mailing an additional followup letter after the duplicate questionnaire. Any changes in basic procedures can alter the results. Variations in the focus of the study, the type of plea extended to the individual to respond, and the population being surveyed may yield different results even when the same timing and types of procedures described in this study are employed. Lack of statistical significance in findings should not cause the real or practical differences between comparisons to be overlooked. A difference of approximately 19% in response rate (favoring sending a followup after three rather than four weeks) would be important to a researcher even if that difference was not statistically significant. Differences in costs per return, although not tested for statistical significance, must also be examined for practical significance to the researcher.

The populations and the absence of subsequent followup mailings may account for differences between findings of the present study and previous research. Higher response rates were previously found when preliminary or advance correspondence was used in surveys of consumers (Ford, 1967; Stafford, 1966; Walker & Burdick, 1977), car buyers (Heaton, 1965), or magazine subscribers (Eisinger, Janicki, Stevenson, & Thompson, 1974). These studies also examined response rates without benefit of followup mailings.

Results of the present study are consistent, however, with those using similar populations. Parsons and Medford (1972), who surveyed what they called homogeneous populations of alumni and religious leaders, found that advance notice made virtually no difference in response rates of alumni, and provided conflicting results with two groups of religious leaders. Kephart and Bressler (1958), also surveyed a homogeneous population, nurses. They were able to compare the benefits of a preliminary letter with a followup mailing including a duplicate questionnaire and found that the followup (with or without a preliminary letter) produced a higher return rate than the preliminary letter without a followup. The present findings also support the use of a reminder rather than a preliminary letter.

Postcard or letter reminders have also been found to significantly increase response rates of employees (Hinrichs, 1975) and the general public (Wiseman, 1973) when no further attempts were made to solicit responses. Moss (1981) also found a significant increase in response rate for university students due to a postcard reminder after one week when subsequent followups were sent. Nichols and Meyer (1966) reported a significant increase in response rate attributed to three-day postcard reminders even with the mailing of a subsequent postcard reminder to

college students. That effect was negated by sending second wave questionnaires in a followup survey of former university students (Rossman and Astin, 1974). The results of the present study are consistent with the findings of Moss and Nichols and Meyer that response rates were higher for reminder groups who sere subsequently sent another followup including a duplicate copy of the questionnaire and a final reminder. There is some support for Cox's suggestion that reminders be sent after one week, rather than two, but the other factors (type of reminder and whether or not a preliminary letter were sent) may also impact the effectiveness of this decision.

To compare results prior to sending the followup and duplicate questionnaire, return rates and costs per return were calculated for all groups at the time at which the followup was sent (see Appendix). Sending a followup with a duplicate questionnaire and a final reminder negated the 10.5% difference (before the followup) in response rate favoring postcard reminders over letter reminders. The 2.9% advantage from sending a preliminary letter decreased to 0.4%, and the 7.9% advantage of sending a reminder after two weeks (rather than after one week) was decreased to 2.9%. The response rate for the one-week reminder group was measured prior to the followup (three weeks after the initial questionnaire was mailed). There is a possibility that response rates might have been more comparable to the two week reminder group after another week (the time at which time the two week response rate was measured).

Other response rate differences, those between the three week and four-week groups that did not receive the reminder, between the reminder and no-reminder groups, and between those who received a reminder in place of a preliminary letter, were greater at the conclusion of the survey than prior to the followup mailing. This does reinforce the need to look at the total design when making comparisons between studies and to be cautious in attempting to generalize findings. Hopefully this study will be a first step in the development of a model for teacher education surveys and will provide the researcher with awareness of the available options and their benefits and costs.

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Appendix

Response Rate and Cost by Condition Prior to Sending a Followup With a Replacement Questionnaire

Condition	n	Respon-dents	Return Rate	Cost per Return
No preliminary letter				
N1 Duplicate at 3 weeks	24	10	41.7%	$1.59
N2 Duplicate at 4 weeks	23	7	30.4%	$2.27
N3 Postcard reminder at 1 week	24	8	33.3%	$2.45
N4 Postcard reminder at 2 weeks	23	12	52.2%	$1.62
N5 Letter reminder at 1 week	21	7	33.3%	$3.15
N6 Letter reminder at 2 weeks	23	7	30.4%	$3.19
Preliminary letter				
P1 Duplicate at 3 weeks	23	10	43.5%	$2.29
P2 Duplicate at 4 weeks	24	5	20.8%	$4.59
P3 Postcard reminder at 1 week	23	12	52.2%	$2.25
P4 Postcard reminder at 2 weeks	24	11	45.8%	$2.36
P5 Letter reminder at 1 week	22	6	27.3%	$4.89
P6 Letter reminder at 2 weeks	22	11	50.0%	$2.64
No preliminary letter (N1-N6)	138	51	37.0%	$2.29
Preliminary letter (P1-P6)	138	55	39.9%	$2.88
Postcard reminder (N3, N4, P3, P4)	94	43	45.7%	$2.19
Letter reminder (N5, N6, P5, P6)	88	31	35.2%	$3.34
One week reminder (N3, N5, P3, P5)	90	33	36.7%	$2.99
Two week reminder (N4, N6, P4, P6)	92	41	44.6%	$2.42
No reminder (N1, N2, P1, P2)	94	32	34.0%	$3.53
Reminder (N3-N6, P3-P6)	182	74	40.7%	$2.35
No reminder:				
Duplicate at three weeks (N1, P1)	47	20	42.3%[a]	$1.94
Duplicate at four weeks (N2, P2)	47	12	25.5%	$3.24
Preliminary letter, no reminder (P1, P2)	47	15	31.9%	$3.05
No preliminary, reminder (N3, N4, N5, N6)	91	34	37.4%	$2.50

[a] $X^2 = 3.03$, $p = .0816$