

**A Cost Analysis Comparing Survey Modes, Incentives, and Response Rates**

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### Introduction/Theoretical Framework

There has been an observed shift in response mode usage from paper to online questionnaires when conducting survey research (Dillman et al., 2014). This shift corresponds with technology available and generally reflects a downward trend in response rates (Dillman et al., 2014; Johnson & Shoulders, 2017; Lindner et al., 2001). However, when examining response rates by mode, studies have shown mail surveys still result in the best response when compared to mixed and web (Dillman et al., 2014; Messer & Dillman, 2011; Olson et al., 2012). We also know the use of incentives is the second-best way to increase response rates behind increasing the number of contacts (Dillman et al., 2014). Response mode and incentive usage both impact the cost of a survey. Mail surveys are the most expensive, while online surveys are the least expensive to conduct, and mixed mode surveys fall somewhere in between (Dillman et al., 2014; Fraenkel et al., 2019; Greenlaw, 2006). This raises the question does using different survey modes and incentives increase responses in a cost-effective way? The purpose of this study was to conduct a cost analysis comparing survey modes, incentives, and response rates.

To address the AAAE’s research agenda question of what evaluation methods, models, and practices are effective in determining the impacts of educational programs in agriculture and natural resources (Thoron et al., 2016), we framed this study with Ajzen’s (1991) Theory of Planned Behavior (TPB). TPB attempts to predict and explain human behavior (Ajzen, 1991). Attitude toward behaviors, subjective norms, and perceived behavior control can influence behavior. Findings from this study could change attitude, shed light on subjective norms, and influence perceived behavior control related to mode and incentive usage in the context of cost.

### Methods

This study was part of an experimental study related to survey response rates. A questionnaire was sent to 1,096 randomly sampled school-based agricultural education (SBAE) teachers across the United States. Each SBAE teacher was randomly assigned to one of eight groups based on response mode and incentive use shown in Table 1, resulting in groups of  $n = 137$ .

**Table 1**  
*Treatment Groups Used in this Study for Comparison*

Response Mode	\$2 Incentive	
	Yes	No
Mail Only	Group 1	Group 5
Web Only	Group 2	Group 6
Mail + Web	Group 3	Group 7
Web + Mail	Group 4	Group 8

Before conducting the experiment, the questionnaire on challenges faced by SBAE teachers was examined for content and face validity by a panel of seven SBAE teacher education professors and pilot tested in Texas. Both paper and online versions of the questionnaire were identical in appearance. For all groups, a prenotice email was sent to participants, followed by a mailed

paper questionnaire or a web access instruction sheet, and the \$2.00 incentive. Two reminder emails were sent one week apart. The third reminder was sent by mail a week later and mode switch happened when appropriate. The final reminder was sent a week later by email. To conduct the cost analysis, all expenses for each experimental group were compiled (\$2.00 incentives, envelopes, stamps, and printed materials). Expenses were totaled for each group and divided by received responses for each group, resulting in an average cost per response.

### Findings

The most expensive cost per response (\$8.98) was observed in Group 1 where a \$2.00 incentive was provided and participants only received a paper copy of the questionnaire, resulting in the second highest response. The least expensive cost per response was observed in Group 6 where no incentive was given, and participants only had access to the web questionnaire. However, Group 6 had the second lowest response. Refer to Table 2 for all group results.

**Table 2**

*Average Cost Per Response Received by Experimental Groups (N = 444)*

Group	Responses (n)	Total 1 <sup>st</sup> & 2 <sup>nd</sup> Mailing Cost	Cost/Response
1	66	\$592.78	\$8.98
2	70	\$420.42	\$6.01
3	64	\$524.73	\$8.20
4	61	\$493.27	\$8.09
5	45	\$346.50	\$7.70
6	47	\$166.29	\$3.54
7	48	\$262.33	\$5.47
8	43	\$242.84	\$5.65
Overall Total	444	\$3,049.15	\$6.87

### Conclusions/Implications/Recommendations

Findings reveal incentives increased the number of responses as indicated by previous research (Dillman et al., 2014) and naturally added expense. However, were the additional responses worth the added cost? The boost in responses observed from using incentives was not cost effective when compared to groups that did not receive an incentive. The cost per response was greatest with paper only groups, followed by mixed mode groups, with web only being the least expensive. This aligned with findings of previous studies (Dillman et al., 2014; Fraenkel et al., 2019; Greenlaw, 2006). Web only groups had a lower cost per response than other survey modes with little difference in responses received. Based on cost alone, we should use web only surveys. Based on response rate, we should use an incentive whenever possible. However, the decision of which mode to use and whether to use an incentive lies with the researcher. Other factors such as budget, quality of data received, statistical power, and the possibility of reducing nonresponse error may play a greater role in these decisions. It is important to note this study used the same mixed communication mode across all experimental groups. We recommend further research by conducting a cost analysis experiment with communication modes instead of response modes. Communication expenses were the majority of expenses in this study and data from an experiment on this topic could lead to additional cost savings in future research.

## References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50, 179-211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, phone, mail, and mixed-mode surveys: The tailored design method* (4<sup>th</sup> ed.). Wiley.
- Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2019). *How to design and evaluate research in education* (10<sup>th</sup> ed.). McGraw-Hill.
- Greenlaw, C. P. (2006). *A comparison of web-based and paper-based survey methods: Testing assumptions of survey mode and response cost* (Publication No. 3230719) [Doctoral dissertation, California State University, Fresno & University of California, Davis]. UMI Microform.
- Johnson, D. M., & Shoulders, C. W. (2017). Power of statistical tests used to address nonresponse error in the *Journal of Agricultural Education*. *Journal of Agricultural Education*, 58(1), 300-312. <https://doi.org/10.5032/jae.2017.01300>
- Lindner, J. R., Murphy, T. H., & Briers, G. E. (2001). Handling nonresponse in social science research. *Journal of Agricultural Education*, 42(4), 43-53. <https://doi.org/10.5032/jae.2001.04043>
- Messer, B. L., & Dillman, D. A. (2011). Surveying the general public over the internet using address-based sampling and mail contact procedures. *Public Opinion Quarterly*, 75(3), 429-457. <https://doi.org/10.1093/poq/nfr021>
- Olson, K., Smyth, J. D., & Wood, H. M. (2012). Does giving people their preferred survey mode actually increase survey participation rates? An experimental examination. *Public Opinion Quarterly*, 76(4), 611-635. <https://doi.org/10.1093/poq/nfs024>
- Thoron, A. C., Myers, B. E., & Barrick, R. K. (2016). Research priority 5: Efficient and effective agricultural education programs. In T. G. Roberts, A. Harder, & M. T. Brashears (Eds.), *American Association for Agricultural Education national research agenda: 2016-2020* (pp. 41-48). UFL Department of Agricultural Education and Communication. [http://aaaeonline.org/resources/Documents/AAAE\\_National\\_Research\\_Agenda\\_2016-2020.pdf](http://aaaeonline.org/resources/Documents/AAAE_National_Research_Agenda_2016-2020.pdf)