IDA+A
Institutional Data Analytics + Assessment

Planning Your Survey: Survey Design, Implementation & Analysis

This document outlines recommendations and best practices for planning, designing, implementing and analyzing results of a survey. For further information, consult IDA+A (idata@purdue.edu).

Design

1. **Have a very specific purpose.**
    a. If your purpose is research, design your survey around a hypothesis. If your purpose is administrative, design your survey around a forthcoming decision.
    b. Ensure that one or more variables in your dataset are a meaningful measure of your research outcome or administrative decision. Also include control and descriptive variables that might explain variation in the outcome.
    c. If you're trying to improve awareness of a service or program, or if you are seeking qualitative information, other methods may work better than a survey.
    d. Consider focus groups or documentary research if you have no thesis, or if you want to gather baseline information about what people are thinking.
2. **Keep the focus narrow.**
    a. Ask all the questions needed to achieve one specific goal. Don't touch briefly on several topics.
    b. If a question doesn't relate to the research theory or administrative decision, omit it.
3. **Don't ask for information you can obtain via other means.**
    a. It isn't necessary to ask gender, class, major, or other personal details in the survey. IDA+A can match individual survey responses to institutional records.
    b. Often there are better ways of measuring an outcome than surveying. For instance, recording card swipes at the entrance to campus events is a better way to measure attendance than a survey.
4. **Don't ask things the respondent isn't qualified to judge.**
    a. Students are often not qualified to judge their own capabilities or accomplishments.
    b. Students may not remember past events correctly. Don't ask their high school GPA or whether they've taken a course. Those details are better retrieved from institutional records.
    c. Survey respondents are best able to express opinions and feelings in the present.
5. **Limit open-ended questions.**
    a. Don't ask open-ended questions unless you plan to perform qualitative text analysis (which will take a lot of time and effort to do properly!)
    b. Expect open-ended questions to elicit comments that are not germane to your purpose.
6. **When possible, use existing survey measures**

   a. For popular, well-established constructs or concepts (e.g., student satisfaction, well-being), use established and psychometrically tested survey measures found in the research literature. Most of these are free to use for academic purposes.
   b. For help in finding survey measures, contact us or visit the Library website

7. **Multiple choice categories should be exhaustive.**
   a. List every answer that respondents might reasonably choose.
   b. You may include an "Other" option. But "Other" should not get more than 5-10% of the response.
   c. If you can't make an exhaustive list, consider more preliminary research.
   d. Example: If you surveyed Purdue students about their favorite pizza and offered only Villa, Papa John's, and Other, the Other option would get more than half of all votes. This would tell you nothing useful. A preliminary focus group would discover that Hot Box, Mad Mushroom, and Domino's are also important options.
8. **Avoid prejudicial or leading questions.**
   a. As noted in item 1b, the survey should only be used to gather information and not to influence opinions.
   b. Don't coax respondents to give positive answers. If you wish to influence opinions, consider a messaging campaign instead of a survey.
9. **Avoid double-barreled questions.**
   a. A question like "Was your instructor knowledgeable and well-prepared?" is troublesome because the instructor might have been knowledgeable but ***not*** well prepared.
   b. Separate these into two or more questions: Was your instructor knowledgeable?" "Was your instructor well-prepared?"
10. **Make every response option distinct and meaningful.**
   a. When using a Likert scale, offer response options that are distinct. If there is no meaningful difference between two options (e.g., "sometimes" and "occasionally") re-write the questions to make all choices meaningful.
   b. Avoid response options distinguished only by the word "Very." There is no difference between a glass of water that is "Full" and a glass of water that is "Very Full."
   c. It is good practice to mix True/False or Yes/No questions in with the scale questions. For instance, "How satisfied were you…?" (Likert Scale) And then "Were you completely satisfied?:" (Yes/No.)
   d. Four or five options are enough choices for almost any Likert Scale.
   e. Be wary of words that have imprecise meaning: (e.g., "Satisfied" or "Sufficient"). These words can mean "barely good enough" to some people and "totally fulfilling expectations" to other people.
   f. Do not automatically accept the default choices that Qualtrics offers.
11. **Use Skip Logic nesting and branching where possible.**
   a. Present follow-up questions to students who have an experience or an opinion, but not to all.
   b. If you feel the need to include a "Does Not Apply" option to a question, consider using Skip Logic instead to bypass the question totally for some respondents. For example, Ask first if students participated in a program or experimental activity, then present follow-up questions only to those who said "Yes."
12. **Use forced answers, but not too much.**
   a. Setting the survey options to compel respondents to answer key questions is acceptable, but forcing too many answer will cause respondents to quit.
   b. The Force Answer option is best used for variables measuring the key outcome.
13. **Consider how questions will appear on the respondent's video screen.**

   a. Many respondents complete on-line surveys using a smartphone. Complex matrix questions with more than three columns wide don't display well on small screens.

14. **Design survey questions with your analysis in mind.**
   a. If, for example, you know that you are going to combine "Agree" with "Strongly Agree" in your analysis, don't ask that detail in your survey. If you plan to conflate six categories into three, don't present six categories in the survey.
   b. If you plan to conduct advanced procedures such as binary logistic regression, create the binary variables in the survey rather than imputing them afterwards.
   c. Carefully consider whether a variable can be treated as a true interval-scale variable. Student course grades are not linear and should be treated as ordinal-scale.
15. **Remember your legal obligations**
   a. Before launching a survey, you must obtain clearance from Purdue's institutional Review Board for Human Subjects Research
   b. Any usage of internet-based messaging must pass ADA requirements for accessibility.
   c. Note that IRB approval or ADA compliance, while necessary, are not sufficient to ensure your survey will be valid.

Implementation

1. **Consider carefully how large a sample you need.**
   a. It is seldom necessary to have more than 1,000 cases to achieve 95% confidence with an acceptable margin of error. For many applications, a sample of ~300 will be adequate.
   b. If you plan only to look at overall results, a moderate sample can suffice. If you plan to compare the answers of smaller groups within the response (e.g., major, gender, class) larger samples may be needed.
2. **Develop messaging that makes the survey seem worthwhile.**
   a. Get a prominent sponsor(s) to endorse the effort.
   b. Don't put the word "survey" in the message.
   c. Pair the email delivery with messaging of other kinds, (e.g., posters, announcements in class, social media)
3. **Don't worry about the response rate.**
   a. Response rates are not a measure of accuracy or validity.
   b. Getting a representative sample of demographic and academic characteristics is more important and is distinct from response rate.
   c. Efforts to improve your sample are better focused on under-sampled groups than the overall total.
   d. Recent student surveys at Purdue have attained responses from as little as 2% to more than 95%. Higher response rates are possible if you devote time in class or during other gatherings for completing the survey. Surveys that rely on email messaging and voluntary participation during students' free time get much lower responses.
   e. Consider a stratified sample. Rather than aiming for a large total sample, plan to gather a necessary minimum number from each category of respondents. An undergraduate sample of 2,000 is adequate IF it contains a sufficient number of each key sub-population.
   f. Rather than offering prizes or sending additional reminder messages to all students (including the categories for which you already have an ample response), consider targeting your next

appeal only to URM students, small academic programs, or other groups that are under-sampled.

4. **Concerning Prizes and Incentives.**
    a. Indiana laws restrict lotteries, but allows prizes under certain conditions. Random-draw gift cards of up to $100 value are common prizes.
    b. Prize offers don't ensure a large response. Often, the person who wins a prize would have done the survey anyway.
    c. Some people enjoy surveys; others don't. Prize offers are unlikely to induce participation from people who really don't want to do it.

Analyzing the results

1. **Remember your research question.**
    a. If you followed Design Recommendation #1, you stated a specific research question or administrative decision point. Focus your analysis on that question.
    b. If you find yourself exploring a dataset with little sense of purpose, that could signal that you've forgotten the objective of the research. When there is a clear and definite question, the answer is easy to find. But when the question is, "What does this data tell us?" there is no end to searching and little chance of finding a conclusive answer.
2. **Use appropriate descriptive statistics**
    a. This class of statistics measures the results. There is a toolbox of appropriate statistics designed for every kind of question. Most are named for a Greek letter (Gamma, Lambda, Phi, Eta, etc.) or for the statistician who discovered or proposed it (Ewell's Q, the Pearson Product-Moment Correlation Coefficient, etc.)
    b. For many surveys, it is appropriate to express the results as the percentage of respondents who give the expected answer ("Agree" or "Satisfied" or "Yes" or whatever) to the question. Statistics provide the same information with less context.
3. **Use appropriate inferential statistics**
    a. This class of statistics tells you how certain you can be that your results are reliable: that the differences you see in your sample really exist in the population and not just in the sample.
    b. Inferential statistics are affected by the size of the sample and the variation observed.
    c. If you have limited experience working with inferential statistics on survey-based data, please contact idata@purdue.edu for assistance. There are many important details to consider when conducting inferential statistics on such data, and we can assist on these areas.
4. **Three Levels of Analysis**
    a. Simple description – This simple approach reports the direct results of one question: *"78% of respondents indicated they feel the Purdue campus is safe and secure."*
    b. Crosstabulation – This deeper level of analysis displays variation in a variable according to respondents' characteristics: *"28% of women strongly agree that the Purdue campus is safe and secure, compared to 35% of men."*
    c. Multivariate modeling – A model includes several predictor variables to measure their combined effect on the outcome. This step is valuable to avoid overstating the effect of one variable. Again, please contact idata@purdue.edu for help in running these types of analyses for survey-based data.
5. **Don't engage in "p-hacking" or "*Post hoc* theorizing"**

a. Random or spurious correlations aren't important. Just because correlations are stronger for some pairs of variables than for others doesn't mean a significant result.
b. "P-hacking" is manipulating results (excluding certain records, adjusting thresholds for success, etc.) until the result passes the measure of statistical significance.
c. "*Post hoc* theorizing" means waiting until you see the results of a program evaluation or experiment, and then declaring the program successful because it did what you observed.

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