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GUIDES TO RESEARCH, SCHOLARSHIP, AND CREATIVE ACTIVITIES IN EDUCATIONAL DEVELOPMENT

EFFECTIVE SURVEY DESIGN FOR RESEARCH: ASKING THE RIGHT QUESTIONS TO GET THE DATA YOU NEED

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The method of survey research is familiar and accessible, but this familiarity can obscure the careful decision-making required to design effective surveys. This guide identifies the key decisions involved with designing surveys for research purposes. Answering these questions will help to ensure that your survey collects the data you need.

WHAT IS SURVEY RESEARCH?

Generally speaking, survey research aims to measure an individual's perceptions, beliefs, or attitudes by having them answer a set of questions. Responses from all participants who complete a survey are combined and analyzed to draw meaningful conclusions at a broader level. Surveys can be small and "homegrown" (e.g., feedback workshop form) or large instruments administered at institutional or national levels (e.g., student evaluations of teaching, National Survey of Student Engagement). Conducting survey research requires several component processes: survey design, sampling and recruitment, data collection, data analysis, and reporting. This guide will focus primarily on survey design, but these other steps should inform your survey design.

Attending to matters of diversity, equity, and inclusion is also important because they can have significant implications for the quality, validity, and usefulness of the data you collect. In this guide, we will share a few examples of how to do this. Finally, before you begin designing your survey, check with your institution's Institutional Review Board to determine whether your work is considered *research* (e.g., you intend to publish/present the results), which requires IRB approval, or assessment/evaluation (e.g., for the purposes of internal program improvement), which may not have the same IRB requirement.

COMPONENTS OF SURVEY RESEARCH

Survey design: The purposeful decision making on what to ask and how to ask it.

Sampling and recruitment: The process of identifying potential survey respondents and getting them to complete the survey.

Data collection: The logistics of how your survey will be administered. *Examples: online versus in-person, anonymous or not, duration and timing of survey period, etc.*

Data analysis*:* The methods you might employ to analyze the survey data. *Examples: qualitative (e.g., close reading, inductive coding), quantitative (e.g., t-test, regression), and mixed methods*

Reporting*:* The process and decision making related to disseminating your findings.

WHAT SHOULD I CONSIDER WHEN DECIDING WHETHER TO USE A SURVEY FOR RESEARCH?

As with any research methodology, it is important to first consider your research question. What is it that you want to know? Consider the following scenario:

> *Our center wants to demonstrate the impact of Faculty Learning Communities (FLCs) on participants' feeling of connectedness, with a special focus on groups who may otherwise feel marginalized within their departments (e.g., women in STEM fields). The FLCs have about 100 participants across five departments. Ideally, this research can be shared with the university stakeholders who currently support the program as well as other SoED scholars through a publication.*
>
> *Our research questions are: To what extent does participating in a department-level FLC help faculty feel more connected to the teaching community? How, if at all, does this vary across different groups of faculty, particularly those who might feel marginalized in their department?*

Once you develop your research question(s), consider if a survey tool will capture the information you need. Like any data collection method, survey research has benefits and drawbacks (Table 1).

Consider Table 1 within the context of our FLC example:

> *We are interested in participants' perceptions and how they change over time. We have a large number of participants, and we need to be able to summarize the results. Given these characteristics of our study, a survey would be an appropriate method.*

Table 1. Strengths and Weaknesses of Survey Research

Strengths	Weaknesses
• An appropriate way to measure perceptions, beliefs, and attitudes • Generally low effort for participants, compared to other methods • Generally easy to summarize the results • Allows for anonymous responses • Can use existing instruments, if appropriate • Can be used to collect uniform data across different groups, in different places, and at different time points	• Because surveys rely on self-report, they may be a less reliable way to measure learning compared to direct measures • The data may be less rich than data from other methods (e.g., interviews, focus groups) • Does not allow for elaboration or asking clarifying questions • Participation is often low; pay attention to how representative your participants are of the population you are interested in • Questions must be carefully designed and tested to yield valid and reliable information

WHAT SHOULD I CONSIDER WHEN USING A SURVEY FOR RESEARCH?

After deciding that a survey is appropriate, subsequent design decisions come down to maximizing two qualities of effective surveys: validity and reliability. Validity is similar to the idea of alignment in educational development. Just like an instructor aligns their assessments with their learning objectives, valid survey questions are aligned with the perception, belief, or attitude you want to measure. Thus, it is important to clarify what you want to measure before designing survey questions.

> *In our FLC study, "connected" could have different meanings, such as whether faculty feel more tied into a community (relatedness) or whether they feel more strongly about themselves as teachers (identity). In this case, we decide that relatedness is the closer match.*

A reliable survey means that differences in how participants respond should reflect differences in how they feel, rather than unrelated, external factors, such as how they interpreted the question.

> *In our FLC study, faculty could interpret "How connected do you feel on campus?" in different ways (e.g., connected in what way? to what/whom?). A more reliable question would narrow the context and define connectedness: "To what extent do you feel part of a teaching community within your department?"*

Throughout the survey design process, continually ask yourself: how will this decision impact my survey's reliability and validity?

QUALITIES OF STRONG SURVEYS

Validity: Survey accuracy; the extent to which a survey gives you information about the perception, belief, or attitude you want to measure.

Reliability: Survey consistency; the extent to which participants who feel similarly respond similarly.

HOW DO I GET STARTED?

Explore existing measures. First, check to see if a valid and reliable survey already exists to measure what you are interested in. You can save time by adopting and adapting those questions as needed (see Jhangiani et al., 2015, for a catalog of existing measures relevant to SoED). Be mindful that in both cases—adopting an existing measure, modifying an existing measure—context and alignment are extremely important for validity. A previously validated measure will not be valid for your study if it does not align well with what you want to measure. Similarly, if you plan to modify an existing measure, it is important that the modifications do not significantly change the meaning or intent of the questions. By changing the questions, the survey is technically not the same as the one that was validated. If the changes are small enough, you can make a stronger argument that they likely did not impact the survey's validity, although additional analyses would be necessary to empirically demonstrate this.

> *For our FLC study, there are several existing measures of relatedness and questions from these measures align with our conception of it. For example, "at work, I feel part of a group" (Van den Broeck et al., 2010). To increase the fit of this measure, we could modify the questions to focus on the academic department (e.g., "within my department, I feel part of a group").*

If a previously validated measure does not exist, or none of the existing measures capture everything you would like to know from your participants, the next step is to draft your own survey questions.

CONSIDERATIONS FOR PREVIOUSLY PUBLISHED SURVEYS

Participants: Was the survey used with a sample of participants similar to the one you will be surveying?

Question wording: Are the questions worded in a way that can translate directly to your context? If not, are the necessary changes in language minimal enough that the idea of the question is still fundamentally similar?

Decide what type(s) of questions to use. The most common types of survey questions are close-ended questions, which lend themselves to quantitative analysis and reporting. Open-ended questions are best reserved for capturing a fuller or more detailed range of participant responses, which can be difficult to anticipate. Open-ended questions require more effort for participants, and they take more work to analyze and report. Your choice of question type depends on what you want to measure and the impact of your choice on the question's reliability and validity.

> *In our FLC study, if we want to know which activities helped faculty feel connected, then we should ask faculty closed-ended questions in which they select the activity from a list or rate the level of connectedness for each activity. Conversely, if we are interested in how the activities helped faculty feel connected, an open-ended question would be more appropriate.*

TYPES OF SURVEY QUESTIONS

Close-ended questions: participants have a clear set of options as their response. *Examples: Likert (e.g., "please rate your agreement from strongly disagree to strongly agree"), multiple choice, and multiple select questions.*

Open-ended questions: participants write their own response to the question. *Example: "Describe your experience in the FLC".*

Word questions and answer choices clearly. Word choice can impact the reliability and validity of survey questions. For example, three common mistakes in question wording are asking double-barreled questions, leading questions, or making assumptions about participants' experiences (see Choi & Pak 2005 and Fowler, 2013 for a review of common mistakes). To avoid these mistakes, word questions to focus on a single idea and use clear, non-technical language so that participants can understand the question in the same way. Additionally, before launching your survey, solicit feedback on a draft of it from people similar to your intended survey audience and who have a variety of perspectives. Doing so can help ensure participants interpret your question in the ways you intended, that none of your questions are unintentionally biased, and that all participants have similar understandings of what the question is asking.

COMMON QUESTION WORDING MISTAKES

Double-barreled questions: Questions that ask participants to report on two things at the same time. *Example: How would you rate the facilitation and the materials in the FLC?*

Leading questions: Questions that suggest a particular response or directionality. *Example: How much did the lack of support for teaching at our institution impact your decision to participate in the FLC?*

Making assumptions of participants: Questions that ask certain participants to respond for a group or assume a shared experience of all participants. *Example: As a woman, why do you think that women feel marginalized in your department?*

Identify what you need to know about your participants. Decide what additional participant information you need (e.g., gender, faculty rank) to help interpret their responses. Only ask participants to provide additional information if: 1) it directly pertains to your research question and 2) you hypothesize that participants might feel differently based on those characteristics (Hughes, Camden, & Yangchen, 2016). Asking for participant information can de facto identify survey participants, which may result in participants feeling less comfortable sharing their true feelings. Three survey design decisions can minimize participant discomfort. First, ask demographic questions at the end of your survey, so participants know what perceptions and opinions their personal information will be associated with. Next, when asking demographic questions, include a statement explaining why the information is being collected, who will have access to it, and how participants' confidentiality will be maintained. Finally, word demographic questions inclusively. For example, when asking about gender identity, include "non-binary" and "prefer to self-describe" in addition to "man" and "woman" (see Frederick, 2020 and Hughes et al., 2016 for guidelines).

> *In our FLC study, we hypothesize that teaching-track faculty have a more inherent interest in feeling connected to a teaching community, so we would ask for faculty rank in our survey. Given our focus on marginalized faculty, we would want to ask for faculty gender and race, but not ask for years of teaching experience or courses taught.*

HOW CAN I LEARN MORE?

Consult the following resources for:

Additional information about **survey design**, including biases and approaches for collecting data:

- Choi, B. C., & Pak, A. W. (2005). A catalog of biases in questionnaires. *Preventing Chronic Disease, 2*(1), A13.
- Fowler, F. J., Jr. (2013). *Survey research methods*. Sage Publications, Inc.
- Rea, L. M., & Parker, R. A. (2014). *Designing and conducting survey research: A comprehensive guide*. John Wiley & Sons.

Additional guidance on developing **inclusive demographic questions**:

- Frederick, J. R. (2020, November 18). *Four strategies for crafting inclusive and effective demographic questions*. Ithaka S+R. https://sr.ithaka.org/blog/four-strategies-for-crafting- inclusive-and-effective-demographic-questions/
- Hughes, J. L., Camden, A. A., & Yangchen, T. (2016). Rethinking and updating demographic questions: Guidance to improve descriptions of research samples. *Psi Chi Journal of Psychological Research*, *21*(3), 138-151.

An example of establishing survey **reliability and validity** and using the survey for research:

- Houseknecht, J. B., Bachinski, G. J., Miller, M. H., White, S. A., & Andrews, D. M. (2020). Effectiveness of the active learning in organic chemistry faculty development workshops. *Chemistry Education Research and Practice*, *21*(1), 387-398.
- Walter, E. M., Henderson, C. R., Beach, A. L., & Williams, C. T. (2016). Introducing the Postsecondary Instructional Practices Survey (PIPS): A concise, interdisciplinary, and easy-to-score survey. *CBE—Life Sciences Education*, *15*(4), ar53.

Sources and examples of **validated survey instruments**:

- Jhangiani, R. S., Troisi, J. D., Fleck, B., Legg, A. M., & Hussey, H. D. (Eds.). (2015). *A compendium of scales for use in the scholarship of teaching and learning*. Early Career Psychologist Committee: Society for the Teaching of Psychology. https://teachpsych.org/Resources/Documents/ebooks/compscalesstl.pdf
- University of Michigan Library. (2021, January 12). *Finding tests & measurement instruments.* https://guides.lib.umich.edu/c.php?g=283088&p=1886075
- Van den Broeck, A., Vansteenkiste, M., De Witte, H., Soenens, B., & Lens, W. (2010). Capturing autonomy, competence, and relatedness at work: Construction and initial validation of the Work-related Basic Need Satisfaction scale. *Journal of Occupational and Organizational Psychology*, *83*(4), 981-1002.

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