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# Survey methods for educators: Selecting samples and administering surveys (part 2 of 3)

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## Summary

This guide describes a five-step process for selecting a sample and administering a survey. Educators can implement this process in their schools, districts, or states to understand a larger population by surveying a subgroup of its members. This approach is supported by the research literature on survey methodology as an accepted way to reduce costs and personnel requirements and increase the speed of analysis and reporting while maintaining accuracy of the results (Cochran, 1977; Ross, 2005). Examples from a Regional Educational Laboratory survey project illustrate each step.

The five-step process for selecting a sample and administering a survey is:

- Step 1: Define the population.
- Step 2: Specify the sampling procedure.
- Step 3: Determine the sample size.
- Step 4: Select the sample.
- Step 5: Administer the survey.

This guide is the second in a three-part series of survey method guides for educators. The first guide in the series covers survey development, and the third guide in the series covers data analysis and reporting.

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## Why this guide?

Increasingly, state and local educators are using data to inform policy decisions (Hamilton et al., 2009; Knapp, Swinnerton, Copland, & Monpas-Huber, 2006; U.S. Department of Education, 2010). Educators need access to a wide variety of data, some of which may not be in their data systems. Survey data can be particularly useful for educators by offering a relatively inexpensive and flexible way to describe the characteristics of a population. To obtain such information, educators may need to conduct their own survey research.

### Survey research process

The survey research process includes survey development, sample selection and survey administration, and data analysis and reporting (figure 1). The activities undertaken in each stage may vary depending on the type of information being collected (Fink, 2013). For example, if educators want to conduct a survey on a topic that has been widely surveyed in similar settings, they may be able to use an existing survey instrument and skip the survey development stage altogether. Or they may decide to use an existing survey but add items of particular interest to their context. If no surveys exist for the topic, educators will need to develop a new survey in stage 1 (see figure 1).

The three guides in this series correspond to the three stages in figure 1 and provide an overview of survey methodologies for a nontechnical audience of educators. However, the resources needed to complete some of the activities may make the series most relevant to larger school districts, state departments of education, and other large agencies. The first guide in the series covers survey development (Irwin & Stafford, 2016), this second guide in the series covers sample selection and survey administration, and the third guide in the series covers data analysis and reporting (Pazzaglia, Stafford, & Rodriguez, 2016).

These guides are intended to lead to the use of survey findings in decisions about policy and practice in schools and local or state education agencies; however, offering guidance on how decisionmakers can use the results is not the focus.

Because this series is an overview, readers seeking a comprehensive guide to survey methods or to complex analyses of survey items are encouraged to explore other resources, such as textbooks, journal articles, and websites dedicated to these topics or to engage consultants who have this type of expertise. For useful references on selecting a sample and administering a survey, see appendix A.

In providing guidance on sample selection and survey administration, this guide draws on examples from a survey project conducted by the authors along with educators in the Virtual Education Research Alliance of the Regional Educational Laboratory (REL)

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**Figure 1. Three stages in the survey research process**



Source: Authors' construction.

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Midwest about online learning in Iowa and Wisconsin (Clements, Pazzaglia, & Stafford, 2015; Clements, Stafford, Pazzaglia, & Jacobs, 2015). See box 1 for an overview of the study.

### Deciding whom to survey

For some research initiatives educators may be able to administer their survey to every member of the group of interest, called the target population (see box 2 for definitions of key terms). When this approach is not practical (for example, when surveying the entire target population would be too expensive or time consuming), educators may use statistical sampling procedures to generalize about the target population from a small sample of its members (Ross, 2005). Sampling procedures can reduce the costs associated with gathering data, reduce personnel requirements for administering the survey, and increase the speed of analysis and reporting (Cochran, 1977; Ross, 2005).

The sampling procedure chosen depends on the objective and scope of the survey project, including the budget, methods of data collection, subject matter, type of respondent wanted, and desired accuracy of the results. Although these considerations are covered in the research literature and in textbooks, most texts focus on complex sampling theory rather than providing accessible explanations.

This guide offers a user-friendly explanation of the basic procedures for selecting a sample and administering a survey using a five-step process: defining the population, specifying the sampling procedure, determining the sample size, selecting the sample, and administering the survey (figure 2). See box 1 for details of each step, along with examples from the REL Midwest Virtual Education Research Alliance survey project.

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#### **Box 1. Overview of a survey project from Regional Educational Laboratory Midwest's Virtual Education Research Alliance**

To identify the types of programs and policies that can support the effective use of online learning, state administrators and policymakers need accurate information about how and why schools are turning to online learning. Recognizing the potential value of this type of information, the Iowa Department of Education and the Wisconsin Department of Public Instruction collaborated with Regional Educational Laboratory Midwest's Virtual Education Research Alliance to administer a survey to a sample of brick-and-mortar public high schools in each state. The survey was designed to gather information about online course use during the 2012/13 school year, including how schools were using online courses for their students, the reasons they were using online courses, the challenges they faced, and the types of support they offered students enrolled in online courses.

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## Box 2. Definitions of key terms

**Accessible population.** The portion of the target population to which the survey team has access to administer a questionnaire.

**Anonymous survey responses.** Survey responses that cannot be linked to the survey respondent.

**Bias.** Bias occurs when a statistic systematically misestimates a value or trait of the target population. Bias can stem from the way the sample is selected. All nonprobability samples result in biased estimates of target population values (see below). Probability samples use techniques to best represent the target population but can also result in biased estimates of target population values if response rates are low or if those who respond to the survey differ in meaningful ways from those who do not (see below).

**Confidence level.** The degree of certainty that the statistic that would be obtained if survey responses were gathered from the entire population would fall within a selected margin of error around the sample statistic (see below). Usually expressed as a percentage, typically as 90 percent, 95 percent, or 99 percent.

**Confidential survey responses.** Survey responses that can be linked back to the survey respondent but that will not be shared outside the survey team or other designated individuals.

**Generalize.** The extension of results from a survey or other study conducted on a sample to the larger target population.

**Margin of error.** The precision or accuracy of the statistics obtained from a survey sample; also known as the confidence interval. A 5 percent margin of error, for example, adds 5 percentage points of uncertainty on either side of a statistic obtained from the survey (statistic plus or minus 5 percentage points). For example, if 75 percent of sampled survey respondents say “yes” to a question and the margin of error is plus or minus 5 percentage points, the true percentage in the population that would say “yes” is estimated to fall between 70 percent and 80 percent.

**Nonprobability sampling.** Sampling procedures in which the probability of each unit in the population being included in the sample is not known. As a result, it is not possible to estimate the accuracy of the sample statistics as approximations of the population (that is, the extent to which the sample statistics match the statistics that would have resulted if the entire population had been surveyed).

**Population size.** The number of people or other units in the target population about which the survey team would like to generalize or make claims based on the survey results.

**Probability sampling.** Sampling procedures in which each unit in the population has a known chance (but not necessarily an equal chance) of being included in the sample. This type of sampling allows researchers to estimate the accuracy of the sample statistics as approximations of the population (that is, the extent to which the sample statistics match the statistics that would have resulted if the entire population had been surveyed).

**Sample.** A subgroup of the target population from which data are collected and used to generalize to the larger population.

(continued)

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## Box 2. Definitions of key terms *(continued)*

**Sample statistics.** Values used to summarize a set of responses obtained from sampled individuals who respond to the survey. When data are obtained using probability sampling procedures, sample statistics are designed to be generalized to the target population.

**Sampling frame.** A list of the students, teachers, or schools (units) in the accessible population.

**Sampling unit.** Students, teachers, schools, or some other unit or element considered for selection to receive a survey questionnaire.

**Stratification variable.** A characteristic used to divide the population into homogenous subgroups (such as grade level or school locale) when using a stratified sampling procedure.

**Survey administration.** The process of distributing the survey to the people (sampled individuals) selected to receive it, encouraging them to fill it out, and collecting it. A survey can be administered online, with paper and pencil, over the phone, or in some other mode.

**Survey nonresponse rate.** The percentage of potential respondents selected for the survey who do not respond. Nonresponse can occur if individuals refuse or are not able to respond to the survey, or if the survey team is not able to contact them to request their response. Survey nonresponse is distinguished from item nonresponse, which occurs when a respondent returns the survey but skips individual questions.

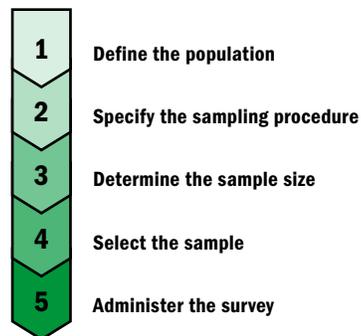
**Survey research.** A research method that uses questions to collect data.

**Target population.** The entire group the survey team wants to obtain information about by generalizing from the survey results.

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**Figure 2. Five steps in selecting a sample and administering a survey**



**Source:** Authors' construction.

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## **Step 1: Define the population**

The first step is to define the population. The target population is the entire group that the survey team wants to make claims about based on the survey results. The accessible population is the portion of the target population to which the survey team has access. How the REL Midwest Virtual Education Research Alliance survey project defined the target and accessible populations is described in box 3. How to define the target population, the type of respondent (unit) to be sampled, and the accessible population are described below.

- Consider the characteristics of the target population.
  - In defining the target population, be as specific as possible about the desired respondents (for example, administrators, teachers, or students), their organization or geographic region (for example, a particular school, district, or state), and other potentially important characteristics (for example, student grade level).
  - The target population for survey research may be broad (for example, all high school students in a particular state) or more focused (for example, kindergarten teachers in one district).
- Make sure that the target population matches the research questions being addressed. If the survey is designed for a particular population, such as grade 9–12 teachers, it should not be administered to a different population.
- Define the sampling unit based on the target population. This will help in selecting the appropriate sampling procedure in step 2. For example, if the target population is all grade 9 students in a district, each student is a unit.
- Define the accessible population.
  - Consider factors that might limit access to some members of the target population. For example, some parents of students in the target population may not provide consent for their children to participate in a student survey.
  - Avoid selecting a target population in which units in the accessible population are likely to differ in important ways from units in the target population because this will introduce bias into the survey results and jeopardize the survey team’s ability to draw conclusions about the target population. For example, a survey team that wants to draw conclusions about all grade 4 teachers in a state but that has access to grade 4 teachers in only one district will not be able to generalize survey findings to the target population. In that case the survey team should either restrict the target population to the accessible units (grade 4 teachers in the district) or consider ways to obtain access to all grade 4 teachers in the state or a more representative sample of grade 4 teachers across districts in the state.

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### **Box 3. Step 1 in practice: Defining the target and accessible populations for the Virtual Education Research Alliance online course use survey**

To make informed decisions about the use of online learning, representatives from the Iowa Department of Education and the Wisconsin Department of Public Instruction needed information about online course use in their states. Both states defined the target population as public brick-and-mortar schools with students in grades 9, 10, 11, and 12, regardless of school structure (for example, schools serving grades 7–12 or grades 9–12). Regular, vocational, alternative, charter, and special education schools were included in the target population. Full-time virtual schools were excluded from the target population because the topics covered by the survey questions were designed for brick-and-mortar schools that use online courses to supplement face-to-face courses (Clements, Stafford, et al., 2015). Because the state departments of education had access to all schools in their state, the target and accessible populations were the same.

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### **Step 2: Specify the sampling procedure**

Once the target population is clearly defined, create a sampling frame and select an appropriate sampling design and procedure. How the REL Midwest Virtual Education Research Alliance survey project selected the sampling procedure is described in box 4.

- A sampling frame is a list of every sampling unit (person, school, or other) in the accessible population. The sampling frame should include any characteristics that may be important in selecting a sampling procedure (for example, student grade or school locale), as well as contact information for each person so the survey can be delivered and retrieved.
- Select an appropriate sampling design and procedure.
  - Decide whether to use a probability or nonprobability sampling design. A probability design allows the results to be generalized to the target population, whereas a nonprobability design does not.
  - Consider the sampling procedures under each design that are appropriate for the context and purpose of the survey. Common types of probability sampling procedures are simple random sampling, systematic sampling, stratified sampling, and cluster sampling (box 5). Common types of nonprobability sampling procedures are convenience sampling, judgment sampling, and quota sampling (box 6).
  - If survey results are to be generalized from a sample to a target population, a probability sampling design must be used. Consider the advantages and disadvantages of each probability sampling procedure described in box 5.

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#### Box 4. Step 2 in practice: Selecting a sampling procedure for the Virtual Education Research Alliance online course use survey

Because the goal of the Virtual Education Research Alliance project was to obtain accurate statewide estimates of online course use, the study team opted to use a probability sampling design that would allow the results to be generalized to the target population. Results of previous studies indicated that the use of online learning differs across urban, town, and rural districts (Picciano & Seaman, 2009; Queen & Lewis, 2011), so the study team chose a stratified sampling procedure. The study team stratified the target population by school locale (city or suburban, town, or rural) and selected a random sample of schools from each locale subgroup in proportion to the size of the subgroup (that is, the percentage of schools sampled from each locale type matched the statewide percentage of schools in that type of locale). This sampling procedure ensured that the Iowa and Wisconsin samples were representative of the target populations with respect to school locale. To the extent that school locale is related to the measured online learning outcomes, this procedure improves the accuracy of the survey statistics relative to simple random sampling (Clements, Stafford, et al., 2015).

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#### Box 5. Probability sampling: Commonly used procedures and considerations

Probability sampling requires that each unit in the population have a known chance (but not necessarily an equal chance) of being included in the sample. This type of sampling allows the survey team to estimate the accuracy of the sample statistics as approximations of the population (that is, the extent to which the sample statistics match the statistics that would have resulted if the entire population had been surveyed).

Procedure	Description	Considerations
Simple random sample	Units are randomly selected from the population such that each unit has an equal probability of being selected.	This procedure requires access to a complete list of the target population. When conducted appropriately, random sampling results in unbiased estimates of the population, which means that the survey team can be confident that the survey results obtained from the sample will generalize to the larger population.
Systematic sample	Consecutive numbers are assigned to each unit in the population, a starting number is randomly selected, and then units are selected at regular intervals from the list to obtain the desired sample size (for example, every 10 units).	This procedure requires access to a complete list of the target population that does not include an order or pattern that would bias the sample (for example, if male and female students were alternated on the list and the sample interval was an even-numbered unit, only one gender would be selected).
Stratified sample	Homogeneous subgroups in the population (for example, urban schools and rural schools) are selected, and units are randomly selected from each subgroup, usually in proportion to the size of the subgroup.	This procedure requires access to a complete list of the target population. If the stratification variable is related to the survey outcomes of interest, stratification provides increased accuracy of estimates that can be generalized to the population without substantial increases in costs.
Cluster sample	Units are randomly selected from clusters (for example, classrooms) in the target population. Either all units in each cluster (for example, all students in the selected classrooms) are included or a random sample of units from each cluster (for example, a sample of students in the selected classrooms) is included.	This procedure requires access to a complete list of the target population of clusters and units within the selected clusters. It can reduce the cost of surveying (for example, rather than surveying one student from each of 100 different classrooms, a survey team might sample 20 students from each of 5 classrooms).

Source: Ross, 2005.

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## Box 6. Nonprobability sampling: Commonly used procedures and considerations

With nonprobability sampling the probability of each unit in the population being included in the sample is not known. As a result, it is not possible to estimate the accuracy of the sample statistics as approximations of the population (that is, the extent to which the sample statistics match the statistics that would have resulted if the entire population had been surveyed). Despite this limitation, nonprobability sampling procedures can be appropriate in some situations, including small-scale testing or piloting surveys prior to full administration.

Procedure	Description	Considerations
Convenience sample	Units are selected from the population based on their accessibility to the survey team.	This procedure limits the time and costs involved in small-scale survey administrations and can result in increased response rates. However, in many cases, easily accessible units of the population are likely to differ from less accessible units in important ways. This introduces bias into the survey results, which means that sample estimates are less likely to generalize to the larger population.
Judgment (purposive) sample	An effort is made to select a “typical” sample that is representative of the population to the best of the survey team’s knowledge.	This procedure can reduce time and costs. The quality of the sample depends on the survey team’s ability to select a sample that is typical of the population. Different survey teams will likely disagree on what constitutes a typical sample, and there is no way to determine how well the results generalize to the population.
Quota sample	Units are selected from various population subgroups in proportion to the size of the subgroup.	This procedure controls the proportion of units sampled from each subgroup, which can increase the accuracy of estimates if conducted appropriately. However, there is typically little control over the procedures for sampling within subgroups, as either convenience or judgment may determine the sampling. As a result, there is no way to check the accuracy of estimates.

Source: Ross, 2005.

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### Step 3: Determine the sample size

Step 3 is to determine how many students, teachers, schools, or other units need to be sampled using the procedure selected in step 2.

**For probability sampling procedures, sample size tables, such as the one shown in table 1, can be used to quickly estimate the required sample size**

To use a sample size table, first determine the target population size, the desired margin of error and confidence level, and the anticipated nonresponse rate, as described below. How the REL Midwest Virtual Education Research Alliance survey project determined the sample size is described in box 7.

- Take the accessible population size from the sampling frame created in step 2. If the population size falls between the values provided in table 1, round up to the next number for a conservative estimate.
- Select the margin of error; the margin of error estimates the precision or accuracy of the statistics obtained from a survey sample. A 5 percent margin of error is the most common; it adds 5 percentage points of uncertainty around the sample statistic (statistic plus or minus 5 percent). Smaller margins of error may be chosen for a critical policy decision that requires precise estimates.

**Table 1. Sample size table for determining the minimum sample sizes required to achieve the specified confidence levels and margins of error**

Population size	Number of units needed for a confidence level of 95 percent			Number of units needed for a confidence level of 99 percent		
	At a 5 percent margin of error	At a 2.5 percent margin of error	At a 1 percent margin of error	At a 5 percent margin of error	At a 2.5 percent margin of error	At a 1 percent margin of error
10	10	10	10	10	10	10
20	19	20	20	19	20	20
50	44	48	50	47	49	50
100	80	94	99	87	96	99
500	217	377	475	285	421	485
1,000	278	606	906	399	727	943
10,000	370	1,332	4,899	622	2,098	6,239
100,000	383	1,513	8,762	659	2,585	14,227
500,000	384	1,532	9,423	663	2,640	16,055
1,000,000	384	1,534	9,512	663	2,647	16,317

Source: Authors' calculations based on a formula presented in Krejcie and Morgan (1970).

- Select the desired confidence level; the confidence level indicates the certainty that the sample results reflect the results for the target population. The most commonly chosen confidence level is 95 percent, which implies a 95 percent certainty that the target population value would fall within the sample statistic, plus or minus the selected margin of error. A 99 percent confidence level may be selected if the information is for a critical policy decision for which users want to be extremely confident that the survey results reflect the views or characteristics of the larger population.
- Correct the required sample size for expected nonresponses. Sample size tables like table 1 show the number of respondents needed to achieve a given level of confidence that the results will reflect the views of the larger population. Because it is rare to get responses from 100 percent of the sampled units, it is necessary to adjust the sample size for anticipated nonresponses. Anticipated nonresponse rates can be predicted using response rates from similar previous surveys or the survey team's knowledge of the sample's willingness or ability to respond (for instance, response rates will likely be lower for parents than for teachers).

For example, if only half of those invited to complete the survey are likely to respond, the number obtained from table 1 should be divided by the anticipated response rate, or 0.5, to get the final sample size. Thus, if the table indicates that 80 responses are required, dividing 80 by 0.5 would give a final sample size of 160.

This procedure corrects for potential nonresponse by adding units to the sample. However, if the anticipated response rate is low enough, it is possible to calculate a required sample size that exceeds the target population size. In this case, the team should consider strategies for increasing the response rates (see step 5).

A low response rate can limit the ability to generalize the sample results to the target population. If the survey response rate is less than 85 percent for a probability sample, the results may not be representative of the target population (U.S. Department of Education, 2012). In this case, it is necessary to check for potential bias (see the third guide in this series, Pazzaglia et al., 2016). Based on this guidance, one approach is to select 85 percent as a desired response rate to limit the risk of bias and initiate the strategies discussed in step 5 to get the highest response rate possible.

### Box 7. Step 3 in practice: Determining the sample size for the Virtual Education Research Alliance online course use survey

For both Iowa and Wisconsin the desired margin of error was 5 percent, the confidence level was 95 percent, and the anticipated response rate was 85 percent. The margin of error and confidence level were chosen because they are the standard values in the literature, and the response rate was selected based on the desire to reach the U.S. Department of Education’s standards (2012). In both states, the population was stratified by school locale: city or suburban, town, or rural.

For Iowa, the stratified sample calculations were as follows (see table below for the final sample sizes based on the following calculations):

- Population size: 396 schools.
- Required sample size using table 1: 217 total schools.
- Required sample size correcting for nonresponse:  $217/0.85 = 256$  total schools.
- Required sample size for each subgroup:
  - City or suburban:  $256 * 0.13$  (proportion of city or suburban schools in population) = 33 schools.
  - Town:  $256 * 0.23$  (proportion of town schools in population) = 59 schools.
  - Rural:  $256 * 0.64$  (proportion of rural schools in population) = 164 schools.

For Wisconsin, the stratified sample calculations were as follows (see table below for final sample sizes):

- Population size: 605 schools.
- Required sample size using table 1: 278 total schools.
- Required sample size correcting for nonresponse:  $278/0.85 = 327$  total schools.
- Required sample size for each subgroup:
  - City or suburban:  $327 * 0.34$  (proportion of city or suburban schools in population) = 111 schools.
  - Town:  $327 * 0.19$  (proportion of town schools in population) = 62 schools.
  - Rural:  $327 * 0.47$  (proportion of rural schools in population) = 154 schools.

#### Population and stratified samples for the Virtual Education Research Alliance online course use survey

Locale	Iowa			Wisconsin		
	Population	Percent	Sample size	Population	Percent	Sample size
City or suburban	51	13	33	207	34	111
Town	92	23	59	112	19	62
Rural	253	64	164	286	47	154
Total	396	100	256	605	100	327

**Note:** The sample sizes reported here do not correspond to the estimates reported in Clements, Stafford, et al. (2015) because the study team used a more complex formula specific to that project (see Cochran, 1977, for more details); however, table 1 provides a useful generalization that can be used for any probability sampling procedure, though the resulting sample sizes may be conservative (larger than necessary) in some cases.

**Source:** Adapted from Clements, Stafford, et al. (2015).

**For nonprobability sampling procedures, practical considerations rather than statistical considerations often guide the sample size selection because the results cannot be generalized to a target population**

The following considerations can help determine the sample size:

- Use sample size tables as a general reference for nonprobability samples if the size of the target population is known.
- Consider the number of units that are accessible or feasible to survey given the personnel and cost limitations.

#### **Step 4: Select the sample**

After selecting a sampling procedure and determining the required sample size, select the units to whom the survey will be administered. Steps for probability and nonprobability sampling designs are described below. The procedure that the REL Midwest Virtual Education Research Alliance survey project used to select sampling units is described in box 8.

**For probability sampling procedures several steps might be included to select the sample**

- Use either a random number generator or a random number table to select units from the sampling frame. Screenshots depicting the steps required to use the random number generator function in Microsoft Excel to obtain a random sample are shown in appendix B.
- Compare the characteristics of the selected sample to the characteristics of the target population to ensure that the sample is similar to the population. The characteristics chosen can be based on research literature on the topics being assessed by the survey (for example, previous research suggests that the use of online learning differs across grade levels) or interests of the survey team (for example, state departments of education may be interested in differences in online course use based on school locale). If there is evidence that the sample is not similar to the population in some way (for example, the proportion of rural schools in the sample is much lower than the proportion of rural schools in the population), consider using a stratified sampling procedure or analysis procedures that correct the survey estimates by weighting the responses of particular types of respondents (for example, respondents from rural schools). Part 3 of this series provides more information about these procedures.
- Create a new list that contains only the sampled units, any stratification variables or characteristics that may be used to calculate survey statistics for subgroups of respondents (for example, students in different grades), and contact information for each unit (see step 4 in appendix B for an example).

**For nonprobability sampling procedures several steps might be included to select the sample**

- Determine the most accessible units of interest. For example, consider targeting the schools of individuals with whom you have personal or professional connections because those individuals may be able to encourage other individuals in their schools to complete the survey.
- Get informed recommendations about typical population characteristics or stratification variables from the literature or experts in the field.
- Create a list of sampled units, any stratification variables or characteristics that may be used to calculate survey statistics for subgroups of respondents, and contact information for each unit (see step 4 in appendix B for an example).

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### **Box 8. Step 4 in practice: Selecting the sample for the Virtual Education Research Alliance online course use survey**

To select the stratified sample for the REL Midwest Virtual Education Research Alliance's study, the study team first created Microsoft Excel files for Iowa and Wisconsin that listed every brick-and-mortar public high school in the target population along with their locale designation, contact information, and other characteristics of interest to the state departments of education that were available in existing data sources (locale, Title 1 eligibility [yes or no], school type [regular, alternative/vocational, special education], and grade span [7–12, 9–12, other]). Separate tabs were created for city or suburban, town, and rural schools in each state file. Next, the project team used the random number generator function in Excel [=RAND()] to create a column of random numbers with the same number of entries as the number of schools in each tab.

The project team sorted the school lists by the random number column and took the required number of schools in each locale category from the top of each list (for example, the first 33 schools in the Iowa city or suburban tab). A new file was created for each state that contained only the sampled schools across locale categories to guide administration and follow up (see step 5). Finally, the study team confirmed that the sample aligned with the population proportions in terms of locale, Title 1 eligibility, school type, and grade span. See appendix B for screenshots depicting the steps for using Excel to obtain random samples and an example of the spreadsheet created for this project.

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### **Step 5: Administer the survey**

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Before administering the survey to the final sample, decide how long to continue to collect data, how frequently and in what manner to follow up with nonresponders, and how to encourage participation. How the REL Midwest Virtual Education Research Alliance administered its survey project is described in box 9. Considerations and recommendations gleaned from that survey project include the following:

- Gain approvals at the school, district, and state levels, as appropriate, prior to administration. Complete any institutional review board or consent processes required by the local or state education agency. Approval processes can take months in some cases, so allow sufficient time for this step.
- Consider strategies to get the highest response rates possible. If the survey response rate is less than 85 percent in a probability sample design, the results may not be representative of the target population (U.S. Department of Education, 2012). See the third guide in this series (Pazzaglia et al., 2016) for information about how to check for representativeness.
  - Allow anonymous or confidential responses rather than identifiable responses whenever possible to increase participants' willingness to respond to the survey and disclose information.
  - Consider incentives for participation (for example, gift cards or entrance into a drawing for a prize).
  - Consider sending advance letters to key personnel (for example, superintendents of districts being surveyed) prior to administering the survey to explain the purpose and potential value of the survey.
  - Enlist a trusted colleague of the potential respondents or a respected organization to send endorsement letters, invitations, and reminders (for example,

- the state departments of education sent invitations and reminders for the REL Midwest Virtual Education Research Alliance survey project).
- Build awareness of the survey and of the importance of the resulting data through websites, posters, announcements, and newsletters.
  - Offer time for individuals to voluntarily complete surveys during a scheduled activity along with the necessary resources to do so (tablets, laptops, or hard copies of the survey).
  - Consider data security.
    - Many free online survey platforms allow data to be stored on the software company's server, which could be problematic if personally identifiable information or other sensitive information is collected.
    - For a paper-and-pencil survey plan for how to secure completed surveys, such as storing them in a locked filing cabinet.
  - Carefully consider the time when the survey is administered. Avoid busy times of the year for potential respondents such as the beginning or end of the school year or holidays. Provide enough time (often six to eight weeks) to yield desired response rates, and consider extending the survey administration period if the desired response rate is not achieved by the deadline.
  - Communicate clearly and efficiently to potential respondents.
    - In an invitation email or letter cover the key elements, including a brief, clear description of what the survey is about, who is administering it, why it is important, how much time it will take to complete, when survey responses are due, how the results will and will not be used, and whether responses will be kept anonymous or confidential. A sample invitation letter is provided in appendix C.
    - Send brief reminders to nonresponders through emails, letters, or telephone calls. Be respectful by limiting the number of reminders and promptly removing respondents from follow-up lists if requested or when they return their questionnaire. A sample reminder letter is provided in appendix D.
    - Thank respondents for their participation and, if possible, share a summary of the survey results with them.
  - Conduct an early check of data during the first week of survey administration to ensure that all information is being recorded correctly.

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### **Box 9. Step 5 in practice: Administering the Virtual Education Research Alliance online course use survey**

The Iowa Department of Education and the Wisconsin Department of Public Instruction administered surveys electronically through a secure online survey system over eight weeks. The intended respondent at each school was the staff person most familiar with the school's online learning program. The Iowa Department of Education and the Wisconsin Department of Public Instruction sent principals in the sampled schools an email that described the purpose of the study and asked them to forward the email to the staff member responsible for overseeing the online learning program at their school. Reminder emails were sent approximately every two weeks during the next eight weeks to principals in schools that had not completed the survey. Each nonresponding school also received up to two reminder phone calls during the final three weeks of the survey administration (Clements, Stafford, et al., 2015).

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## **Using this guide**

Educators can use this guide (the second in a three-part series) to define their target population, specify an appropriate sampling procedure, determine the required sample size, select the sample, and successfully administer a survey. In combination, these steps can help educators develop useful generalizations about their target population by studying a smaller subgroup of its members. Sound sampling and administration procedures can reduce the time and costs of the survey team and can contribute to their ability to draw valid conclusions from the resulting data. The first guide in the series covers survey development (Irwin & Stafford, 2016), and the third guide in the series covers data analysis and reporting (Pazzaglia et al., 2016).

## **Limitations of this guide**

This guide has two limitations. First, it is intended to provide educators and policymakers with an overview of considerations for selecting a sample and administering surveys in practical education contexts; thus, it does not provide a complete review of the complex, technical details of sampling procedures. Educators and policymakers interested in more complex sampling procedures or a more detailed explanation of any sampling procedure may seek additional resources from a list provided in appendix A.

Second, this guide does not provide tools, such as survey administration platforms, that may be needed to administer surveys. Many of these resources are available on the Internet, but it is important to consider data security when using publicly available resources.

## **Appendix A. Additional survey sampling and administration resources**

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Additional resources for sampling and survey administration are provided in this appendix, including textbooks, journal articles, and professional organizations with expertise in these topics.

### **Potentially useful documents**

Bartlett, J. E., Kotrlik, J. W., & Higgins, C. C. (2001). Organizational research: Determining appropriate sample size in survey research. *Information Technology*, 19(1), 43–50.

DeVellis, R. F. (2012). *Scale development: Theory and applications* (3rd ed.). Thousand Oaks, CA: Sage.

Fink, A. (2013). *How to conduct surveys: A step-by-step guide* (5th ed.). Thousand Oaks, CA: Sage.

Fowler Jr., F. J. (2008). *Survey research methods* (4th ed.). Thousand Oaks, CA: Sage.

Groves, R. M., Fowler Jr., Couper, M. P., & Lepkowski, J. M. (2009). *Survey methodology*. New York, NY: Wiley.

Hinkin, T. R. (1998). A brief tutorial on the development of measures for use in survey questionnaires. *Organizational Research Methods*, 2(1), 104–121.

Schrijver, W. (2013). *How to estimate your population and survey sample size?* (Web log comment). Retrieved August 13, 2015, from <https://www.checkmarket.com/2013/02/how-to-estimate-your-population-and-survey-sample-size/>.

Wright, P. V., & Marsden, J. D. (2010). *Handbook of survey research*. Bingley, UK: Emerald Group Publishing.

### **Other potentially useful resources**

AdvancED's guide to administering surveys and generalizing survey results  
[http://extranet.advanc-ed.org/assist\\_resources\\_and\\_tools/docs/ASSIST\\_SurveyGuide.pdf](http://extranet.advanc-ed.org/assist_resources_and_tools/docs/ASSIST_SurveyGuide.pdf)

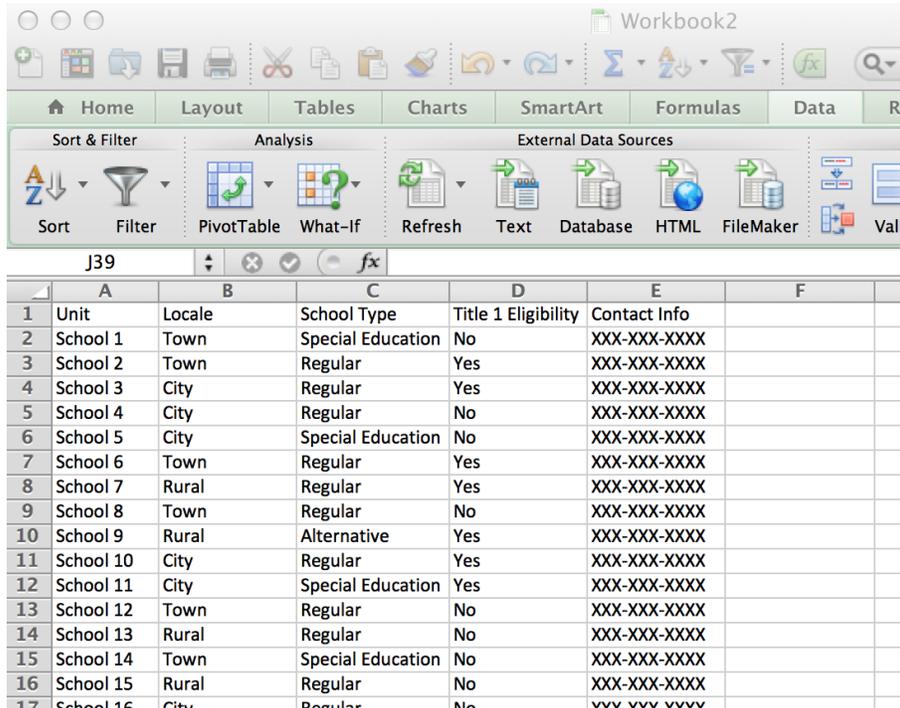
Dartmouth Office of Institutional Research's surveys: Why, when and how  
[http://www.dartmouth.edu/~library/biomed/services/lgr/docs/SurveyLGR\\_final.pdf?mswitch-redir=classic](http://www.dartmouth.edu/~library/biomed/services/lgr/docs/SurveyLGR_final.pdf?mswitch-redir=classic)

Harvard University Program on Survey Research: Resources  
<http://psr.iq.harvard.edu/book/psr-resources>

## Appendix B. Using Microsoft Excel to obtain a random sample

Steps for obtaining a random sample in a hypothetical example are depicted below using screenshots from Microsoft Excel. In this example, the target population is 30 schools, and the required sample size is 20 schools. Random samples can also be obtained using random number tables or random number generators that are available online.

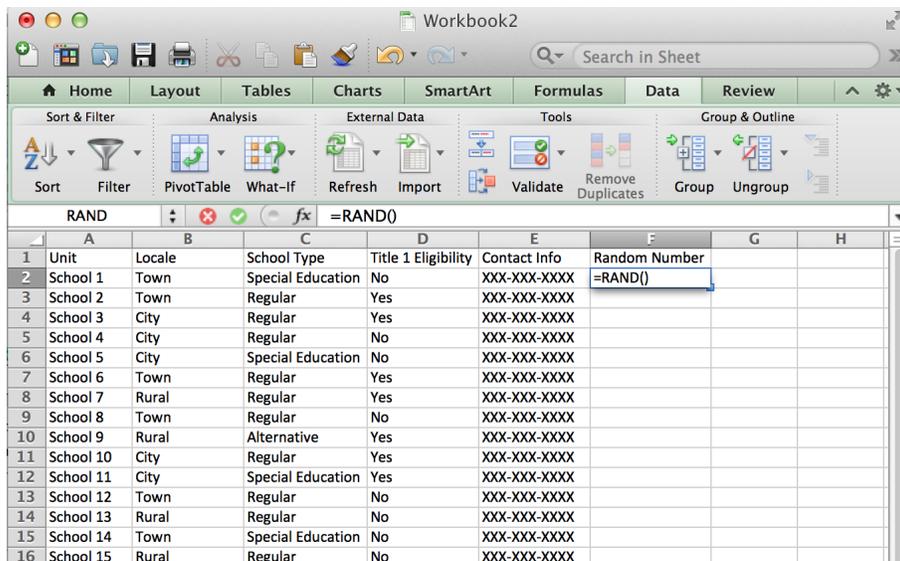
**Step 1: Create a Microsoft Excel spreadsheet listing every unit in the accessible population along with any stratification variables and contact information**



	A	B	C	D	E	F
1	Unit	Locale	School Type	Title 1 Eligibility	Contact Info	
2	School 1	Town	Special Education	No	XXX-XXX-XXXX	
3	School 2	Town	Regular	Yes	XXX-XXX-XXXX	
4	School 3	City	Regular	Yes	XXX-XXX-XXXX	
5	School 4	City	Regular	No	XXX-XXX-XXXX	
6	School 5	City	Special Education	No	XXX-XXX-XXXX	
7	School 6	Town	Regular	Yes	XXX-XXX-XXXX	
8	School 7	Rural	Regular	Yes	XXX-XXX-XXXX	
9	School 8	Town	Regular	No	XXX-XXX-XXXX	
10	School 9	Rural	Alternative	Yes	XXX-XXX-XXXX	
11	School 10	City	Regular	Yes	XXX-XXX-XXXX	
12	School 11	City	Special Education	Yes	XXX-XXX-XXXX	
13	School 12	Town	Regular	No	XXX-XXX-XXXX	
14	School 13	Rural	Regular	No	XXX-XXX-XXXX	
15	School 14	Town	Special Education	No	XXX-XXX-XXXX	
16	School 15	Rural	Regular	No	XXX-XXX-XXXX	
17	School 16	City	Regular	No	XXX-XXX-XXXX	

**Step 2: Use the random number generator function in Excel to create a column of random numbers with the same number of entries as the number of units in the file**

- Make a column heading for “Random Number.” Type =RAND() in the first cell in the random number column and hit Enter.



	A	B	C	D	E	F	G	H
1	Unit	Locale	School Type	Title 1 Eligibility	Contact Info	Random Number		
2	School 1	Town	Special Education	No	XXX-XXX-XXXX	=RAND()		
3	School 2	Town	Regular	Yes	XXX-XXX-XXXX			
4	School 3	City	Regular	Yes	XXX-XXX-XXXX			
5	School 4	City	Regular	No	XXX-XXX-XXXX			
6	School 5	City	Special Education	No	XXX-XXX-XXXX			
7	School 6	Town	Regular	Yes	XXX-XXX-XXXX			
8	School 7	Rural	Regular	Yes	XXX-XXX-XXXX			
9	School 8	Town	Regular	No	XXX-XXX-XXXX			
10	School 9	Rural	Alternative	Yes	XXX-XXX-XXXX			
11	School 10	City	Regular	Yes	XXX-XXX-XXXX			
12	School 11	City	Special Education	Yes	XXX-XXX-XXXX			
13	School 12	Town	Regular	No	XXX-XXX-XXXX			
14	School 13	Rural	Regular	No	XXX-XXX-XXXX			
15	School 14	Town	Special Education	No	XXX-XXX-XXXX			
16	School 15	Rural	Regular	No	XXX-XXX-XXXX			

- The =RAND() cell will become a random number between 0 and 1. Copy this cell and paste the contents into all cells below it so that each unit row has a random number entry.

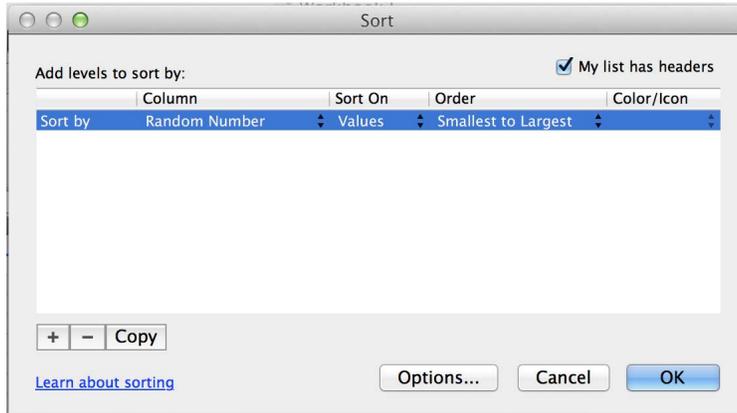
	A	B	C	D	E	F	G
1	Unit	Locale	School Type	Title 1 Eligibility	Contact Info	Random Number	
2	School 1	Town	Special Education	No	XXX-XXX-XXXX	0.478819709	
3	School 2	Town	Regular	Yes	XXX-XXX-XXXX	0.217114018	
4	School 3	City	Regular	Yes	XXX-XXX-XXXX	0.844072879	
5	School 4	City	Regular	No	XXX-XXX-XXXX	0.716789928	
6	School 5	City	Special Education	No	XXX-XXX-XXXX	0.666809485	
7	School 6	Town	Regular	Yes	XXX-XXX-XXXX	0.342088421	
8	School 7	Rural	Regular	Yes	XXX-XXX-XXXX	0.711641574	
9	School 8	Town	Regular	No	XXX-XXX-XXXX	0.520813586	
10	School 9	Rural	Alternative	Yes	XXX-XXX-XXXX	0.090965589	
11	School 10	City	Regular	Yes	XXX-XXX-XXXX	0.855930992	
12	School 11	City	Special Education	Yes	XXX-XXX-XXXX	0.985165952	
13	School 12	Town	Regular	No	XXX-XXX-XXXX	0.091339702	
14	School 13	Rural	Regular	No	XXX-XXX-XXXX	0.609186839	
15	School 14	Town	Special Education	No	XXX-XXX-XXXX	0.415768978	
16	School 15	Rural	Regular	No	XXX-XXX-XXXX	0.376723996	

### Step 3: Sort the units by the random number column

- Select all of the data by clicking and dragging across the entire range of data. Under the Data tab, Sort & Filter option, choose “Custom Sort...”

	A	B	C	D	E	F	G
6	School 5	City	Special Education	No	XXX-XXX-XXXX	0.666809485	
7	School 6	Town	Regular	Yes	XXX-XXX-XXXX	0.342088421	
8	School 7	Rural	Regular	Yes	XXX-XXX-XXXX	0.711641574	
9	School 8	Town	Regular	No	XXX-XXX-XXXX	0.520813586	
10	School 9	Rural	Alternative	Yes	XXX-XXX-XXXX	0.090965589	
11	School 10	City	Regular	Yes	XXX-XXX-XXXX	0.855930992	
12	School 11	City	Special Education	Yes	XXX-XXX-XXXX	0.985165952	
13	School 12	Town	Regular	No	XXX-XXX-XXXX	0.091339702	
14	School 13	Rural	Regular	No	XXX-XXX-XXXX	0.609186839	
15	School 14	Town	Special Education	No	XXX-XXX-XXXX	0.415768978	
16	School 15	Rural	Regular	No	XXX-XXX-XXXX	0.376723996	

- Check the box for “My list has headers,” and under “Sort by” select “Random number” column. Click OK.



**Step 4: Copy the number of units recommended by your sample size table from the top of the list (the first 20 schools in this example) and paste it into a new spreadsheet that contains only the sampled schools along with their characteristics of interest and contact information**

	A	B	C	D	E	F	G
1	Unit	Locale	School Type	Title 1 Eligibility	Contact Info	Random Number	
2	School 24	Town	Special Education	No	XXX-XXX-XXXX	0.034352237	
3	School 27	Rural	Regular	No	XXX-XXX-XXXX	0.086188438	
4	School 9	Rural	Alternative	Yes	XXX-XXX-XXXX	0.090965589	
5	School 12	Town	Regular	No	XXX-XXX-XXXX	0.091339702	
6	School 20	Rural	Alternative	Yes	XXX-XXX-XXXX	0.157601694	
7	School 30	Town	Regular	No	XXX-XXX-XXXX	0.1703012	
8	School 2	Town	Regular	Yes	XXX-XXX-XXXX	0.217114018	
9	School 26	City	Regular	Yes	XXX-XXX-XXXX	0.234130278	
10	School 6	Town	Regular	Yes	XXX-XXX-XXXX	0.342088421	
11	School 29	Rural	Regular	Yes	XXX-XXX-XXXX	0.342924955	
12	School 15	Rural	Regular	No	XXX-XXX-XXXX	0.376723996	
13	School 14	Town	Special Education	No	XXX-XXX-XXXX	0.415768978	
14	School 19	Rural	Regular	Yes	XXX-XXX-XXXX	0.415974132	
15	School 25	Town	Regular	Yes	XXX-XXX-XXXX	0.457039605	
16	School 21	Rural	Alternative	No	XXX-XXX-XXXX	0.478524864	
17	School 1	Town	Special Education	No	XXX-XXX-XXXX	0.478819709	
18	School 8	Town	Regular	No	XXX-XXX-XXXX	0.520813586	
19	School 13	Rural	Regular	No	XXX-XXX-XXXX	0.609186839	
20	School 28	Rural	Alternative	Yes	XXX-XXX-XXXX	0.656204284	
21	School 5	City	Special Education	No	XXX-XXX-XXXX	0.666809485	
22	School 22	City	Alternative	Yes	XXX-XXX-XXXX	0.678699815	
23	School 17	City	Regular	No	XXX-XXX-XXXX	0.711366591	
24	School 7	Rural	Regular	Yes	XXX-XXX-XXXX	0.711641574	
25	School 4	City	Regular	No	XXX-XXX-XXXX	0.716789928	
26	School 18	Town	Regular	No	XXX-XXX-XXXX	0.763255678	
27	School 23	City	Regular	Yes	XXX-XXX-XXXX	0.765403431	

<span>Home</span> <span>Layout</span> <span>Tables</span> <span>Charts</span> <span>SmartArt</span> <span>Formulas</span> <span>D</span>						
Sort & Filter		Analysis		External Data Sources		
Sort	Filter	PivotTable	What-If	Refresh	Text	Database
<span>H1</span> <span></span> <span></span> <span></span> <span></span> <span></span>						
	A	B	C	D	E	F
1	Unit	Locale	School Type	Title 1 Eligibility	Contact Info	
2	School 24	Town	Special Education	No	XXX-XXX-XXXX	
3	School 27	Rural	Regular	No	XXX-XXX-XXXX	
4	School 9	Rural	Alternative	Yes	XXX-XXX-XXXX	
5	School 12	Town	Regular	No	XXX-XXX-XXXX	
6	School 20	Rural	Alternative	Yes	XXX-XXX-XXXX	
7	School 30	Town	Regular	No	XXX-XXX-XXXX	
8	School 2	Town	Regular	Yes	XXX-XXX-XXXX	
9	School 26	City	Regular	Yes	XXX-XXX-XXXX	
10	School 6	Town	Regular	Yes	XXX-XXX-XXXX	
11	School 29	Rural	Regular	Yes	XXX-XXX-XXXX	
12	School 15	Rural	Regular	No	XXX-XXX-XXXX	
13	School 14	Town	Special Education	No	XXX-XXX-XXXX	
14	School 19	Rural	Regular	Yes	XXX-XXX-XXXX	
15	School 25	Town	Regular	Yes	XXX-XXX-XXXX	
16	School 21	Rural	Alternative	No	XXX-XXX-XXXX	
17	School 1	Town	Special Education	No	XXX-XXX-XXXX	
18	School 8	Town	Regular	No	XXX-XXX-XXXX	
19	School 13	Rural	Regular	No	XXX-XXX-XXXX	
20	School 28	Rural	Alternative	Yes	XXX-XXX-XXXX	
21	School 5	City	Special Education	No	XXX-XXX-XXXX	
22						

## Appendix C. Sample survey invitation

A survey invitation from the Regional Educational Laboratory Midwest's Virtual Education Research Alliance survey project is shown below as an example. This invitation was emailed to the principals of all sampled high schools at the start of the survey administration period.

Dear Principal,

You are invited to participate in a survey regarding online course use in your school. This study is being conducted by [INSERT ORGANIZATION] with the support of [INSERT COLLABORATING ORGANIZATIONS]. The results of the study will help us better understand how online courses are being used in [INSERT STATE] schools.

Below is the link to the survey, **which should be completed by the staff person in your school who is most familiar with your online learning program.** While several staff may need to be consulted in order to ensure accurate responses, we ask that only one representative from your school submit the survey. Please have the following information before you begin the survey:

- The number of online courses taken by students in your school in 2012/13.
- The number of students in your school who were enrolled in online courses in 2012/13.
- The number of enrollments in online courses for your school in 2012/13, both overall and by academic subject.
- The reasons that online courses were used.
- How your school supported students who took online courses.

[INSERT ORGANIZATIONS] will neither penalize nor reward you or your school based on your responses to the survey. **The survey will take approximately 15 minutes to complete. Your school's participation is voluntary.**

Click the link below to access the survey.

[INSERT SURVEY LINK]

**Please complete the survey by [INSERT DATE].**

Sincerely yours,

[INSERT SIGNATURE AND AFFILIATION]

## **Appendix D. Sample survey reminder**

A reminder from the Regional Educational Laboratory Midwest Virtual Education Research Alliance survey project is shown below as an example. This reminder was emailed to the principals of the sampled high schools who had not completed the survey. A version of this email was sent every two weeks during the eight-week survey administration period.

Hello,

Time is running out for your school to complete the online course use survey. The results of the study will help us better understand how online courses are being used in [INSERT STATE] schools. Your participation is voluntary but vital since only a sample of schools have been invited to participate.

**Below is the link to the survey, which should be completed by the staff person in your school who is most familiar with your online learning program. The survey will take approximately 15 minutes to complete.**

[INSERT SURVEY LINK]

**Please complete the survey by [INSERT DATE].**

We will be in touch via phone next week.

Sincerely yours,

[INSERT SIGNATURE AND AFFILIATION]

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