Technical Document (TAI0426T)

This technical document provides information about the survey administration—including target population, sample design, and field dates—for the 2026 Survey on Teachers' Use of Generative AI in Math and Science Instruction (TAI0426T) survey administered to members of the American Teacher Panel (ATP).

Survey Overview

- **Survey name:** 2026 Survey on Teachers' Use of Generative AI in Math and Science Instruction (TAI0426T)
- **Project contacts:** Lief Esbenshade (University of Washington, AmplifyLearn.AI Center), Min Sun (University of Washington, AmplifyLearn.AI Center)
- **Topic(s) covered:** Teachers' use of generative AI tools, math and science instruction, professional learning, challenges in generative AI (GenAI) adoption

About the American Teacher Panel (ATP)

The American Teacher Panel (ATP) is a standing survey panel of PK–12 teachers in public schools who teach in the United States. The ATP began in 2014 and currently includes more than 30,000 teachers. The ATP was designed to produce nationally representative estimates of the public school teacher population. The ATP can also be used to produce state-level estimates in about 20 states and to investigate subgroup differences in the teacher population.

Teachers are recruited into the ATP using probability-based sampling methods. The sampling frame for the ATP is a commercially available list of all U.S. public school teachers that RAND researchers obtain from MDR Education. Though the sampling frame is intended to be as comprehensive as possible, it likely underrepresents teachers who are new to the profession entirely as well as experienced teachers who are new to their current state or district.

Teachers recruited to the ATP have agreed to participate in online surveys several times per school year and receive incentives for doing so. All ATP surveys are conducted online and in English.

For more information about the creation of the ATP, see Robbins and Grant (2020).[1]

Target Population and Survey Sample

Population

The target population for this survey was K–12 public school teachers in the United States who teach math and science.

Sample Design

The sample for the TAI0426T survey was designed to achieve 1,000 completed surveys, with the goal that the final number of cleaned and weighted cases in the survey data file would fall within +/- 5 percent of this survey completion target.

Using the American Teacher Panel (ATP) as a frame, a sample of 2,500 panelists was drawn to be invited to complete the survey, assuming a survey completion rate of 40%. The assumed completion rate was informed by observed completion rates from prior panel surveys.

Members of the American Teacher Panel (ATP) were invited to join with non-equal probabilities. Therefore, to avoid extreme design effects in the weights, we used probability sampling to select a survey sample such that the final probabilities of selection across participants would produce a sample close to a representative random sample design.

In general, for ATP surveys, each participant i has a probability p_{fi} of being in the sampling frame (a probability estimated via calibration to allow the sampling frame to be similar to the national population). We selected the probability p_{si} of sampling from the frame so that:

$$\frac{p_{si}}{p_{fi}} \approx constant$$

where the constant is the same across all participants.[2]

Panelists were sampled using their previously-observed characteristics. However, panelists' information (e.g., their years of experience, the specific school that they serve in) can change from school year to school year. Therefore, when panelists first respond to a survey each school year, they update their demographic information contained in their panel records. These corrections to panelists' records are saved and used in sampling for subsequent surveys.

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[1] Michael W. Robbins, and David Grant. *RAND American Educator Panels Technical Description*, RAND Corporation, RR-3104-BMGF, 2020. As of March 18, 2026: https://www.rand.org/pubs/research_reports/RR3104.html

[2] Even though the strictly equal equation has a unique solution, the solution can lead to a probability greater than 1 for some participants (especially when a high proportion of panelists in a particular cluster are sampled). When this happens, selection probabilities are trimmed to be reasonable.

Survey Fielding

This survey was fielded between Monday, April 27, 2026, and Monday, June 08, 2026.

The survey had an approximate administration time of 10 minutes. Panelists who completed the survey received a $10 e-gift card upon completion. This e-gift card allows recipients to redeem the incentive value at one of more than a dozen national vendors.

We contacted panelists by email to invite them to participate in this survey. The first email invitation was sent to 2,497 sampled panelists on April 27, 2026. Panelists who had not yet completed the survey received up to 6 reminder emails encouraging them to participate in the survey. Table 1 shows the reminder email schedule and the number of emails sent at each time point.

Table 1. Email reminder schedule

Contact	Date sent	Number of emails sent
1st reminder	05/06/2026	1,808
2nd reminder	05/14/2026	1,610
3rd reminder	05/20/2026	1,509
4th reminder	05/27/2026	1,443
5th reminder	06/02/2026	1,406
6th reminder	06/05/2026	1,374

Access to surveys is restricted to enrolled panel members through secure login credentials. Invitations for each survey are sent directly to each panelist's registered email, ensuring that only authorized individuals can respond. Each panelist is assigned a unique identifier, which allows survey responses to be tracked and prevents duplicate participation. Because of these design and security features, the ATP effectively eliminates issues such as automated “bot” respondents, fabricated accounts, or unauthorized individuals completing surveys multiple times.

Survey Completion

When the field period ended on June 08, 2026, there were 1,157 fully or partially completed surveys that we reviewed for inclusion in the data file. Of these, 125 cases were screened out by the survey instrument. During data cleaning, 1 additional case was removed due to respondent ineligibility (e.g., the respondent no longer had an eligible job title or had moved to serve in an ineligible school). Meanwhile, 20 cases were dropped because the respondent did not complete a sufficient share of substantive items (10%) to merit being retained in the data file.

In total, 1,011 cases received a weight and are included in the final data file. Using the American Association for Public Opinion Research's Response Rate Definition 6, the survey specific completion rate was 42.6%.[3] The survey has an approximate margin of error (MOE) of +/-3.2 percentage points with 95% confidence for a binary estimate with a 50% distribution. These MOEs are adjusted to account for weighting.

Survey Weighting

To ensure our survey sample looked similar to the target population—at least on observed characteristics—we created a set of survey weights. Our weighting process is intended to produce sample representativeness while limiting the size of the survey's design effect.

We obtained population benchmarks used in sampling and weighting from the Common Core of Data (CCD) (2024–25) for school-level information and the National Teacher and Principal Survey (NTPS) (2020–21) for educator-level information. School neighborhood poverty data were obtained from the School Neighborhood Poverty Estimates (2021–22).

We first provide a general overview of the weighting process before describing the specifics for this survey. The weighting process accounts for both the probability that panelists were selected to be invited to participate in the TAI0426T survey and the likelihood that the invited panelist completed the survey. These likelihoods are calibrated to reproduce the national population distribution of U.S. public school teachers. This weighting approach is widely used for probability-based sample surveys[4] and to adjust for nonresponse[5] including for surveys like the National Teacher and Principal Survey administered by the U.S. Department of Education.[6]

The final analysis weights in the data file are the product of three interim weights:

(1) The calibrated weight of the sampling frame (i.e., one that assigns a weight to each panel member based on person- and school-level characteristics so that the sum of the weights along the calibration factors closely matches the target population)
(2) The sample selection weight (i.e., the inverse of the probability of selection into the survey sample from the sampling frame)
(3) The survey response weight (i.e., the inverse of the modeled probability of a sampled panelist completing the survey)

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[3] The American Association for Public Opinion Research. 2023. *Standard Definitions: Final Dispositions of Case Codes and Outcome Rates for Surveys*. 10th edition. AAPOR.
[4] Deville, Jean-Claude and Carl-Erik Särndal. "Calibration Estimators in Survey Sampling," *Journal of the American Statistical Association*, Vol. 87, No. 418, 1992.
[5] Kott, Phillip. "Using Calibration Weighting to Adjust for Nonresponse and Coverage Errors," *Survey Methodology*, Vol. 32, No. 2, 2006.
[6] Taie, Soheyla and Laurie Lewis, *Characteristics of 2020–21 Public and Private K–12 School Teachers in the United States: Results From the National Teacher and Principal Survey.* U.S. Department of Education, National Center for Education Statistics, NCES 2022-113, 2022.

The final response adjustment is important to eliminate observed sources of response bias. The products of these weights were subsequently recalibrated and trimmed if necessary.

More specifically, the sampling frame weights (1) were calibrated using iterative proportional fitting (also known as raking) to align the distribution of eligible panelists with the distribution of the target population along each of the characteristics reported in the table below. The sample selection weight (2) was created using the inverse of the selection probabilities p_{si}. The response weights (3) were estimated by modeling the likelihood p_{ri} of a selected participant responding to the survey conditional on several person-level and school-level characteristics. For parsimony, a variable selection method was used to choose the model that best fit the data.

The main weight was estimated as the product of the sampling frame calibration weight $\left(\frac{1}{p_{fi}}\right)$, the sample selection weight $\left(\frac{1}{p_{si}}\right)$, and the response weight $\left(\frac{1}{p_{ri}}\right)$. That is:

$$\omega_{main} = \frac{1}{p_{fi}} \times \frac{1}{p_{si}} \times \frac{1}{p_{ri}}$$

To ensure the final weight sums to the target population, the composite weight was raked once more to align the distribution of survey respondents with the distribution of the target population. A trimming process (at the 99th percentile) is used to account for instances where the resulting weights have extreme values. The trimmed weights are then scaled so the sum of the weights matches the size of the target population after trimming.

The weights for this survey were calibrated using person-level variables (gender, race/ethnicity, years of experience, and educational attainment) and school-level variables (school level, school locale, school enrollment size, school student racial/ethnic composition, and school neighborhood poverty level).

The table below provides an overview of the sample characteristics before and after survey weights are applied and shows how the sample compares to the target population on observed characteristics.

Note that any missing demographic data is imputed using Multivariate Imputation by Chained Equations (MICE) for weighting purposes. However, missing values are preserved in the final data file.

The design effect after trimming is 1.08.

Table 2. Unweighted, weighted, and population estimates for calibration variables

Variable	Unweighted			Weighted			Population
	Mean	Confidence interval		Mean	Confidence interval		
		Lower	Upper		Lower	Upper	
School level							
Elementary	60.2	57.2	63.3	62.0	59.0	65.0	61.9
Middle	16.8	14.5	19.1	17.6	15.3	20.0	17.7
High	23.0	20.4	25.5	20.4	17.9	22.9	20.4
School neighborhood poverty (income-to-poverty ratio)							
High poverty (0 to 200)	14.8	12.6	17.0	15.6	13.3	17.8	15.6
Middle poverty (201 to 400)	55.7	52.6	58.8	56.9	53.9	60.0	56.9
Low poverty (401 or more)	29.5	26.7	32.3	27.5	24.7	30.2	27.4
School student racial/ethnic composition							
Mostly students of color	47.1	44.0	50.2	48.7	45.6	51.8	48.7
Mostly white students	52.9	49.8	56.0	51.3	48.2	54.4	51.3
School enrollment size							
Large	67.5	64.6	70.3	64.0	61.0	67.0	64.0
Small	32.5	29.6	35.4	36.0	33.0	39.0	36.0
School locale							
Urban	27.2	24.4	30.0	27.5	24.7	30.2	27.5
Suburban	40.0	36.9	43.0	36.6	33.6	39.6	36.5
Town/Rural	32.8	29.9	35.7	35.9	33.0	38.9	36.0
Gender							
Female	79.1	76.6	81.6	84.5	82.3	86.8	84.6
Male	20.9	18.4	23.4	15.5	13.2	17.7	15.4
Race/ethnicity							
Minority	18.8	16.4	21.2	22.7	20.1	25.3	22.9
White	81.2	78.8	83.6	77.3	74.7	79.9	77.1
Years of experience							
0 to 9 years	31.3	28.4	34.1	25.9	23.2	28.6	25.9
10 or more years	68.7	65.9	71.6	74.1	71.4	76.8	74.1
Educational attainment							
Bachelor's or less	36.8	33.8	39.8	32.0	29.1	34.9	31.9
More than Bachelor's	63.2	60.2	66.2	68.0	65.1	70.9	68.1

NOTE: Population totals are from NCES's 2020–21 National Teacher and Principal Survey. Panelists' data on their school characteristics are obtained by linking panel records to NCES's 2024–25 Common Core of Data. School neighborhood poverty data were obtained from the 2021–22 EDGE School Neighborhood Poverty Estimates. Any slight differences between characteristics calculated from the survey data and this table are a result of imputation of missing values of the calibration variables during sampling and when creating weights.

Suggested Citation

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