



Washington STEM Teacher Survey Summary Report

Katie Choate, University of Washington

Dan Goldhaber, American Institutes for Research, University of Washington

Andrew Katz, University of Washington

Roddy Theobald, American Institutes for Research

Abstract: This policy brief summarizes the responses by early-career science, technology, engineering and math (STEM) teachers in Washington State to the Washington STEM Teacher Survey. These early-career STEM teachers were asked about their perspectives of their teacher education program (TEP) and STEM subject preparation, with a focus on their student teaching experiences. The survey also included questions about teacher compensation and the teachers' future teaching plans. We find that respondents generally view their preparation experiences more favorably than their current work environment and compensation, which suggests further research relating these survey responses to later teacher outcomes.

**This research was supported by the National Science Foundation (award number 1660948). We wish to thank Nate Brown, Natsumi Naito, and Becca Ortega for outstanding research assistance, Kirk Walters, Mark Windschitl, and Kathe Taylor for comments on the Washington STEM Teacher Survey, as well as Nathaniel Marcuson, Sydney Payne, Wezi Phiri, and Seraphina Shi for their help in implementing the survey. The views expressed here are those of the authors and do not necessarily represent those of American Institutes for Research or the University of Washington. Any errors are attributable to the authors.*

Suggested citation: Choate, K., Goldhaber, D., Katz, A., Theobald, R. (2020). Washington STEM Teacher Survey Summary Report. CEDR Policy Brief No. 03172020-1. University of Washington. <http://cedr.us/papers/working/CEDR%20PB%2003172020-1.pdf>

© 2020 by Katie Choate, Dan Goldhaber, Andrew Katz, and Roddy Theobald. All rights reserved. Short sections of text, not to exceed two paragraphs, may be quoted without explicit permission, provided that full credit, including © notice, is given to the source.

You can access other CEDR publications at
<http://www.CEDR.us/publications.html>

THE WASHINGTON STEM TEACHER SURVEY

About

In an effort to better understand the needs of early-career science technology engineering and math (STEM) teachers, researchers at the University of Washington Center for Education Data & Research (CEDR) administered an original online survey titled “The WA STEM Teacher Survey” to roughly 4,600 early career STEM teachers. As described below, the eligible teachers had less than three years of teaching experience and were either recently licensed in a STEM field or were teaching in a STEM classroom in a Washington State public school.

In the spring and early summer of 2019, we used the survey to ask eligible teachers questions about their perspectives of their teacher education program (TEP) and STEM subject specific preparation, with a focus on their student teaching experiences. The survey also included questions about teacher compensation and the teachers’ future teaching plans.

Eligible Teachers

Eligible teachers were teaching 1st-12th grade in a Washington State public school in the 2017-18 school year and had either:

- 1) Received a STEM teaching credential with no more than three years of teaching experience (i.e., graduating after 2014); or
- 2) Were observed teaching at least one math or science course during the 2017-2018 school year.

We identified STEM courses from the 2017-2018 Washington State Course Catalog. Teacher endorsement and credential information was derived from the state’s eCert system. All endorsements identified as STEM were put into science, math, and technology “bins”. This information allowed us to identify a sample of 4,594 eligible STEM teachers.

Note: The Comprehensive Education Data and Research System (CEDARS) data include fields designed to link students to their individual teachers, based on reported schedules. However, limitations of reporting standards and practices across the state may result in ambiguities or inaccuracies around these links.

Survey Content

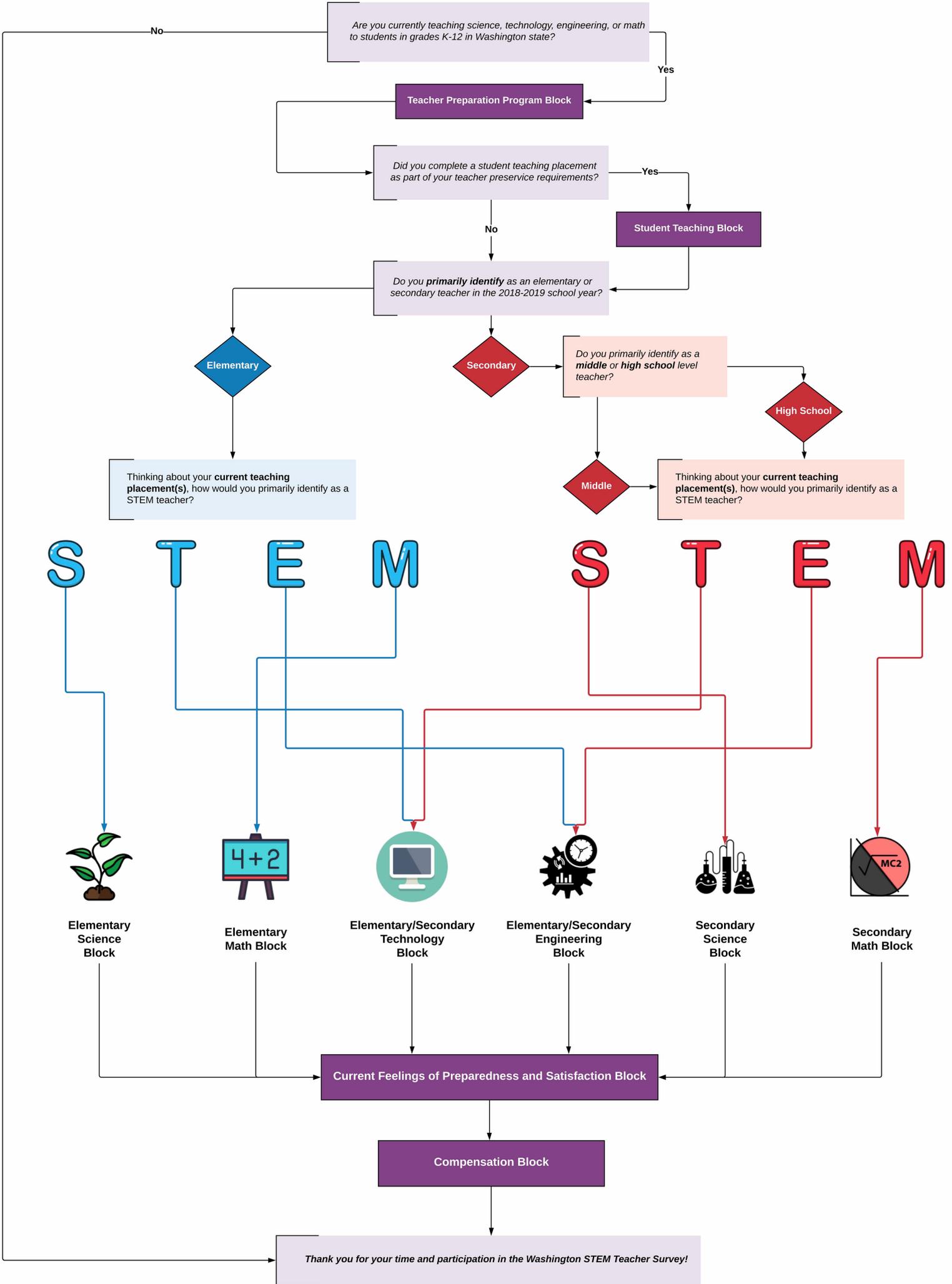
Many of the included survey questions were derived from three previously utilized surveys:

- 1) Examining Teacher Preparation: Does the Pathway Make A Difference? (Boyd et al., 2009), and;
- 2) The Schools and Staffing Survey (National Center for Education Statistics, 2013).
- 3) Washington State Teacher Compensation Survey (Goldhaber et al., 2011)

We then added original questions to the STEM Teacher Survey about teacher compensation and future plans developed by the study’s Expert Planning Team and the Project Directors, Dan Goldhaber, Roddy Theobald, Kirk Walters, and Mark Windschitl

The following page gives an overview of the dynamic survey flow that a teacher takes, dependent on their STEM subject and school level.

Washington STEM Teacher Survey Flow



RESPONSE RATE

50.4%

Consistent with the American Association of Public Research (AAPOR), we calculated our survey response rate by dividing the number of surveys returned (2,302) by the total number of surveys sent out to eligible STEM teachers (4,587) resulting in a response rate of 50.42%.

Survey Respondents Response Rate

Overall Survey Response Rate		$(2,302/4,566) = 50.42\%$
Survey Sample of Eligible Teachers	4,566	
Total Surveys Returned	2,302	

Complete Surveys Responses (100% Complete)	1852	$(1,852/2,302) = 80.45\%$ of all surveys returned were complete
---	------	--

Partial Survey Responses (< 50% Complete) 242

Partial Survey Responses (> 50% Complete) 2060

School District Representation		$(205/237) = 86.5\%$ of all sample districts were represented in the survey
---------------------------------------	--	--

Districts in the sample 237

Districts Represented 205

*There are 295 school districts in the state of Washington. Fifty-eight districts did not have early career STEM teachers teaching in their district at the time of this study.

RESPONDENTS VS. NON-RESPONDENTS

Who took the
WA STEM Teacher Survey?

78.8%

of teachers that took the survey taught in a school in the Western part of the State (West of the Cascade Mountain range).

46.0%

of the students in the schools of teachers that took the survey received free or reduced priced meals.

76.5%

of teachers that took the survey received their teaching credential instate in Washington.

1.72 yrs

of teaching was the average experience of teachers that took the survey.

Who did NOT take the
WA STEM Teacher Survey?

76.3%

of teachers that did NOT take the survey taught in a school in the Western part of the State (West of the Cascade Mountain range).

46.2%

of the students in the schools of teachers that did NOT take the survey received free or reduced priced meals.

76.7%

of teachers that did NOT take the survey received their teaching credential instate in Washington.

1.86 yrs

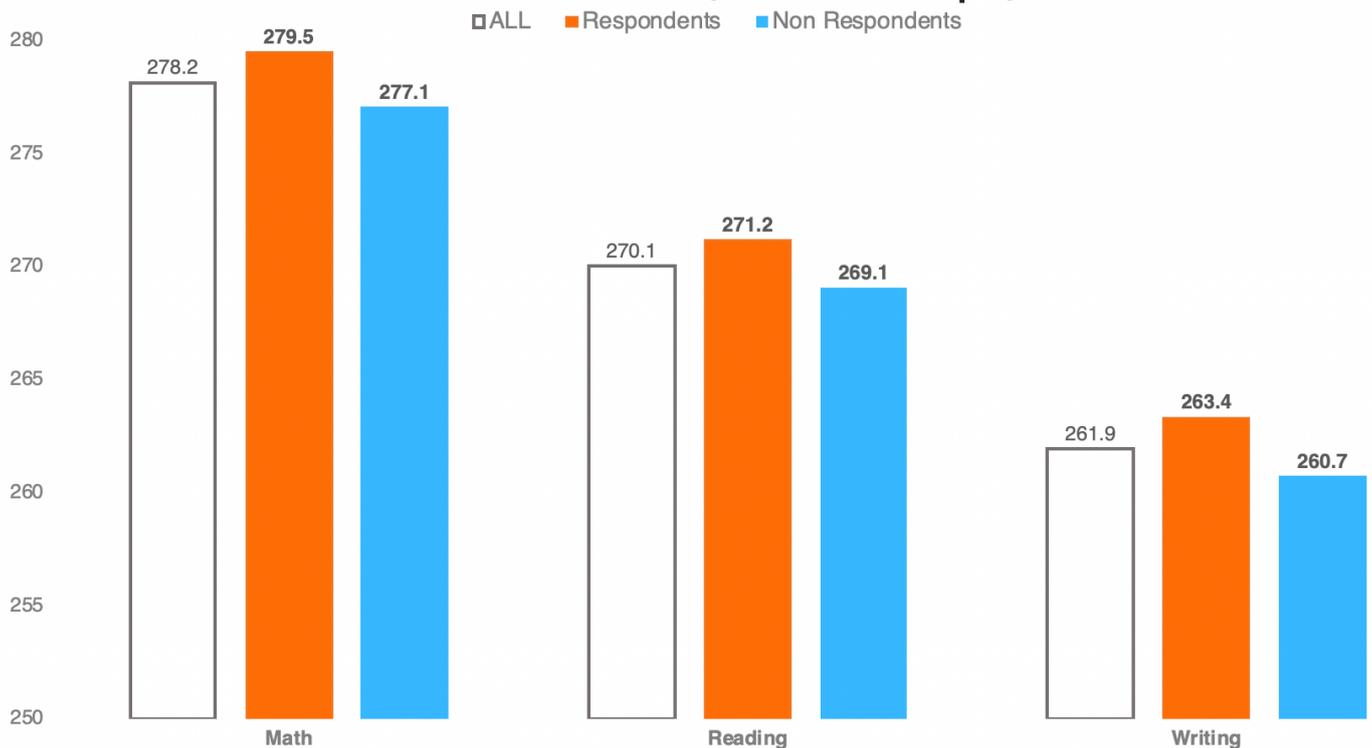
of teaching was the average experience of teachers that did NOT take the survey.

We compare these groups to understand how the survey respondents represent the nonrespondents, and the STEM Teacher Survey sample as a whole. For example, teachers with more teaching experience were significantly less likely to take the survey.

Who took the WA STEM Teacher Survey?

Teachers with higher WEST-B test scores were more likely to complete the survey; for example, teachers who completed the survey scored on average 2.5 points higher on the WEST-B Math test than teachers who did not respond to the survey.

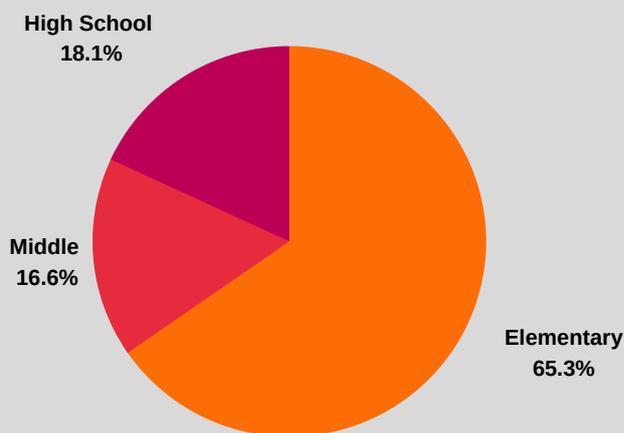
Sample (ALL) vs. Respondents vs. Non-Respondents
WEST-B Scores (First Attempt)



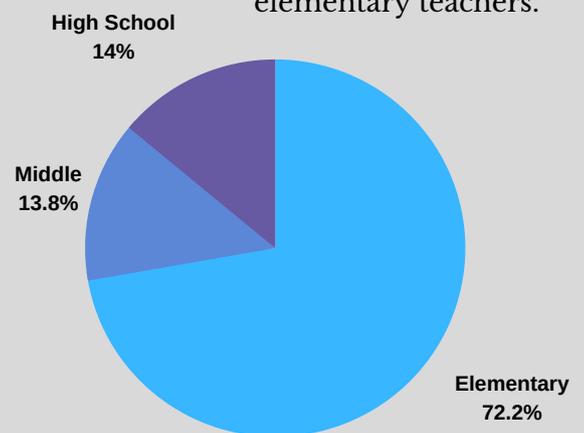
Note: Each of these differences between respondents and non-respondents is statistically significant at the .05 level.

Which school level do they teach at?

The majority of teachers that took the survey were elementary teachers.

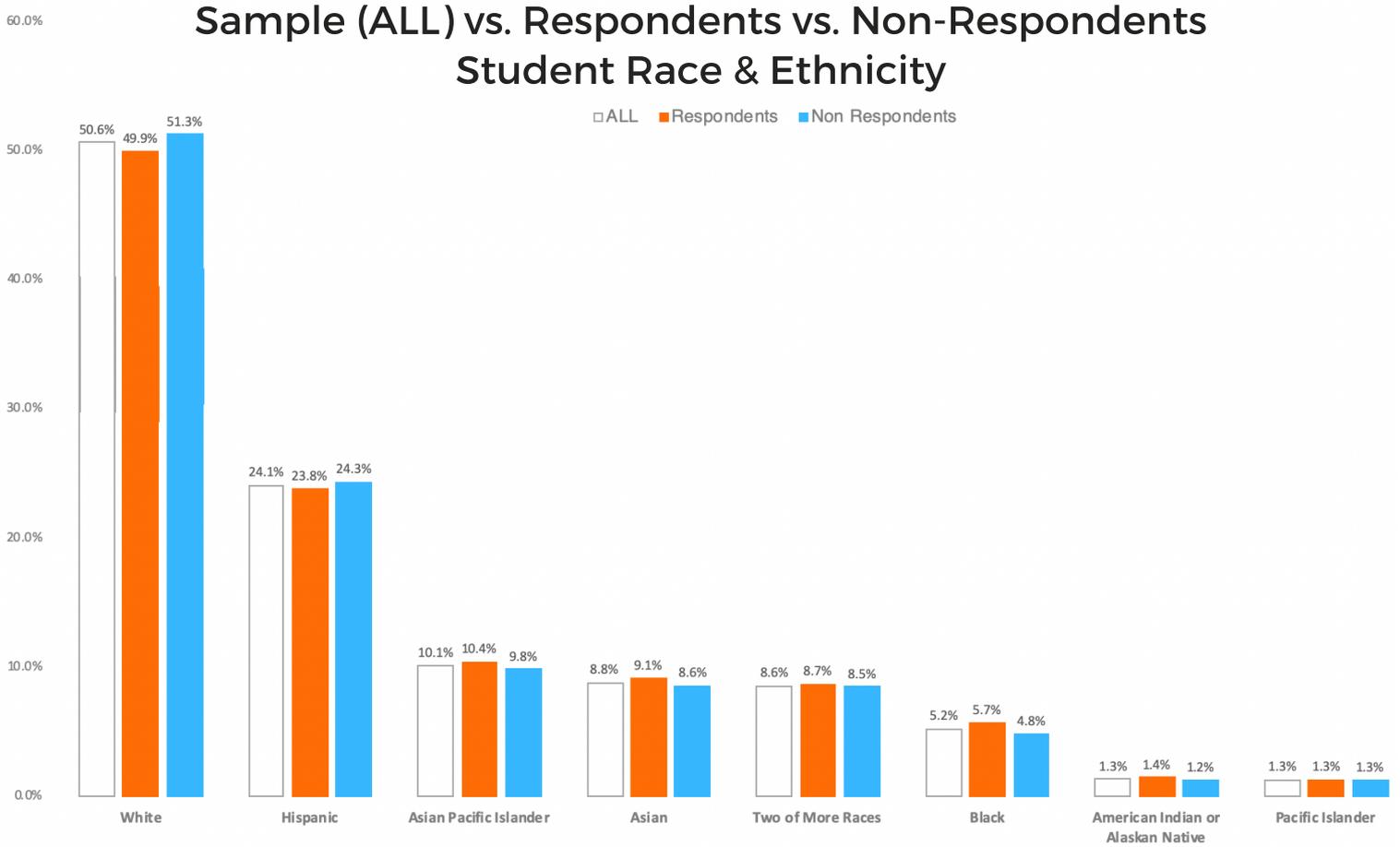


Respondents



Non-Respondents

STUDENT DEMOGRAPHICS AT THE SCHOOL LEVEL



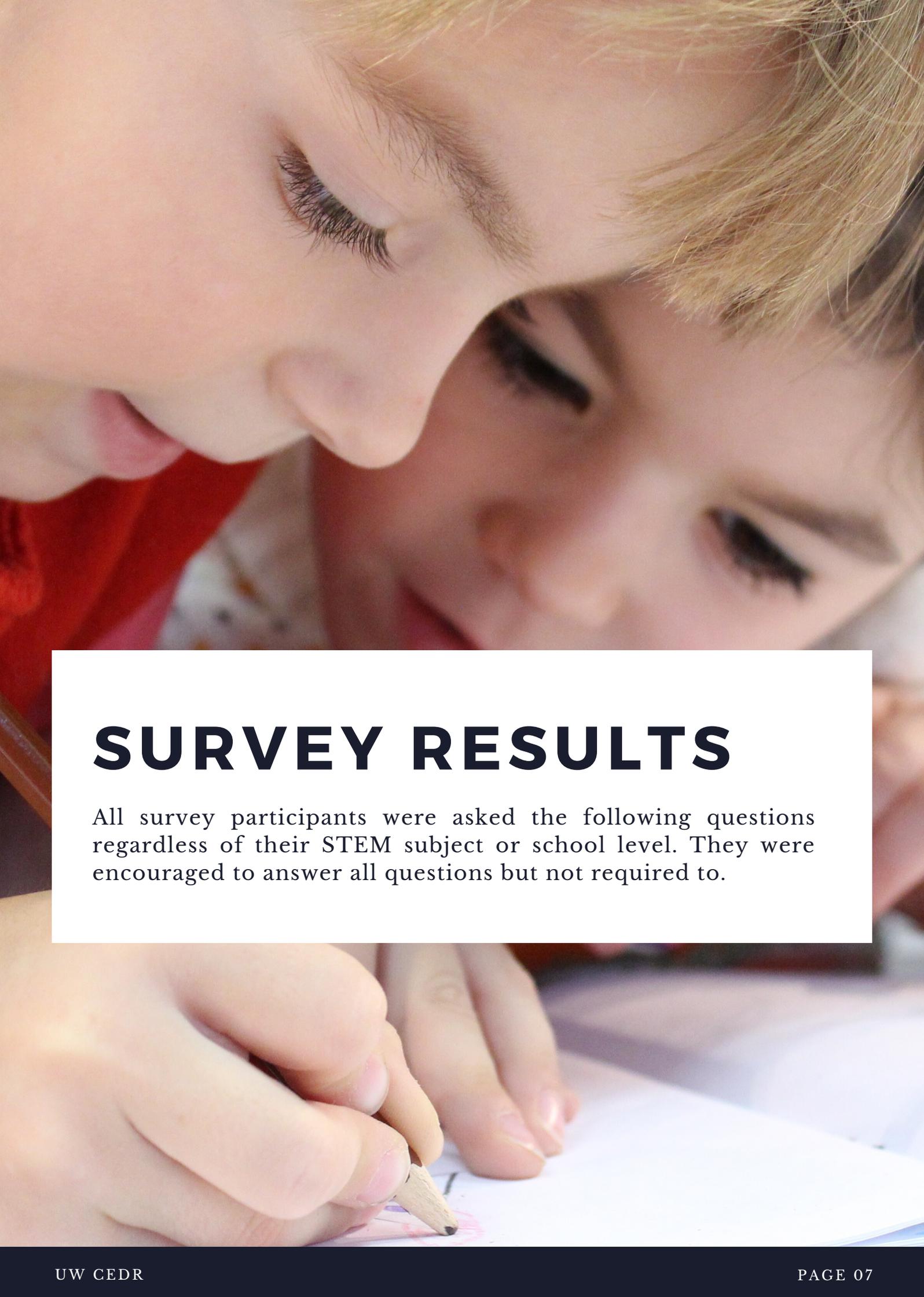
Note: The only statistically-significant difference in student race demographics between respondents and non-respondents is teachers with a higher percentage of black students at the school and district level were more likely to complete the survey.

for teachers that took the WA STEM Teacher Survey:

14.0% of students were in special education

14.4% of students were transitional bilingual

3.2% of students were enrolled in 504 Plans

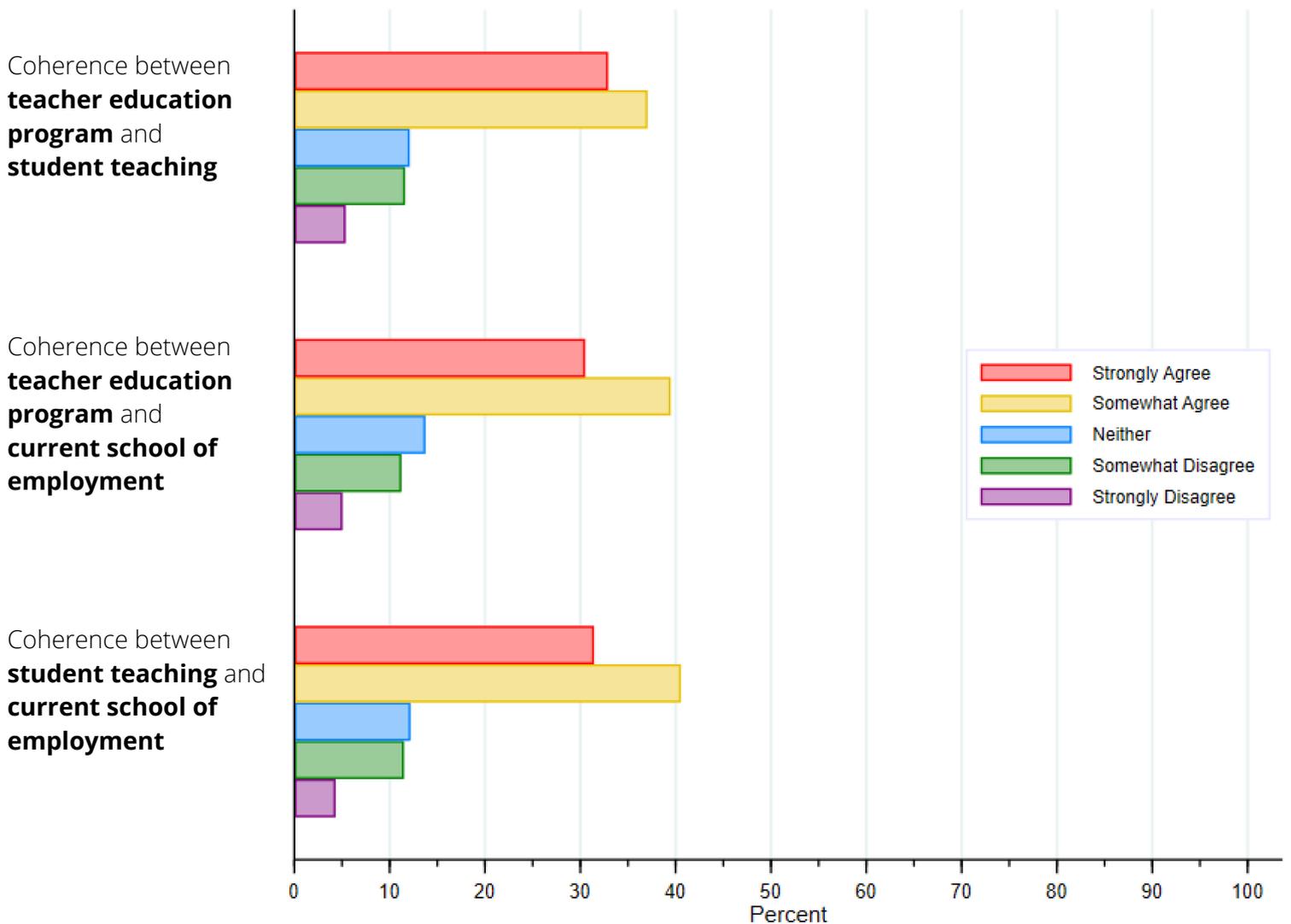


SURVEY RESULTS

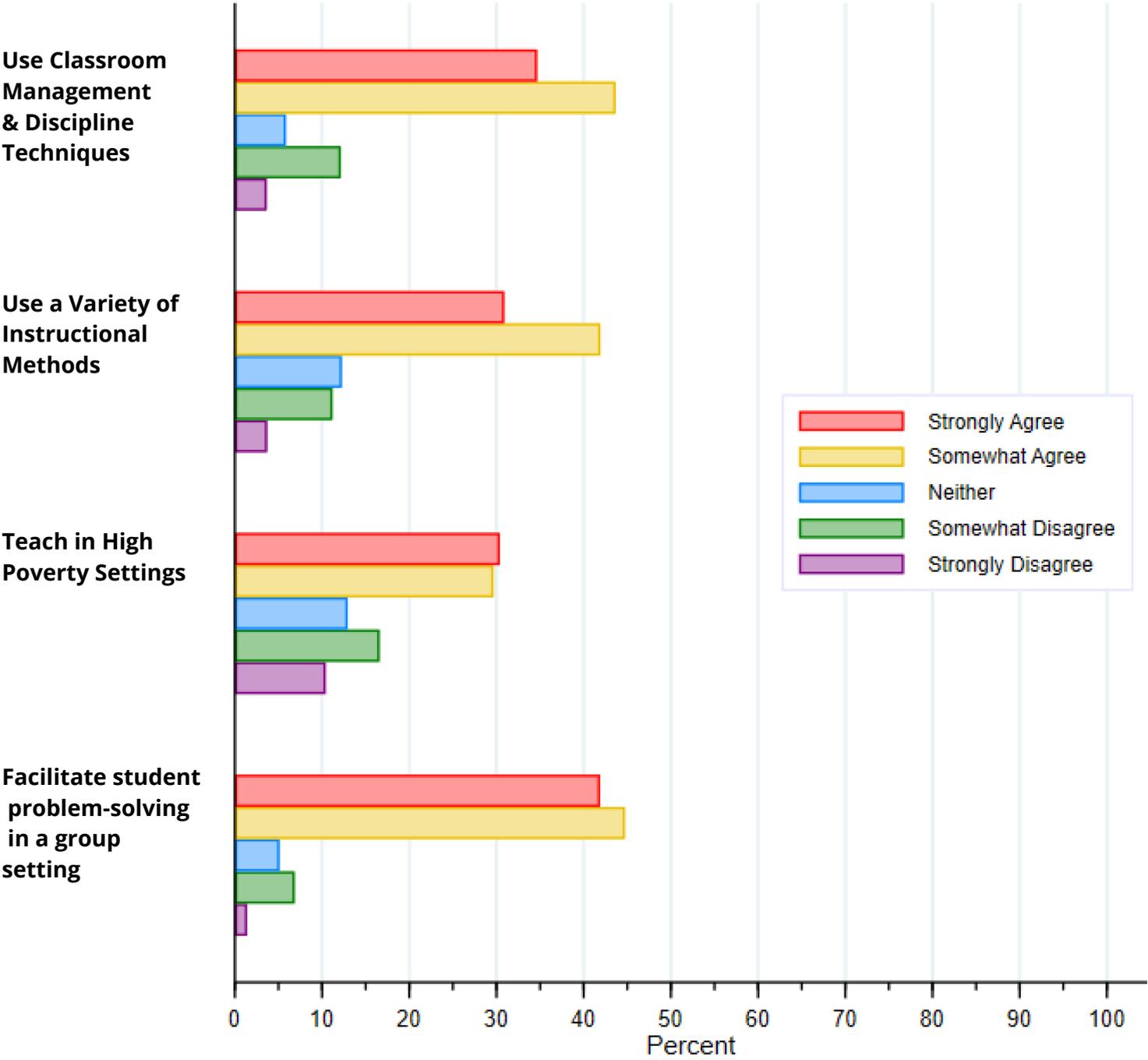
All survey participants were asked the following questions regardless of their STEM subject or school level. They were encouraged to answer all questions but not required to.

ALIGNMENT QUESTIONS

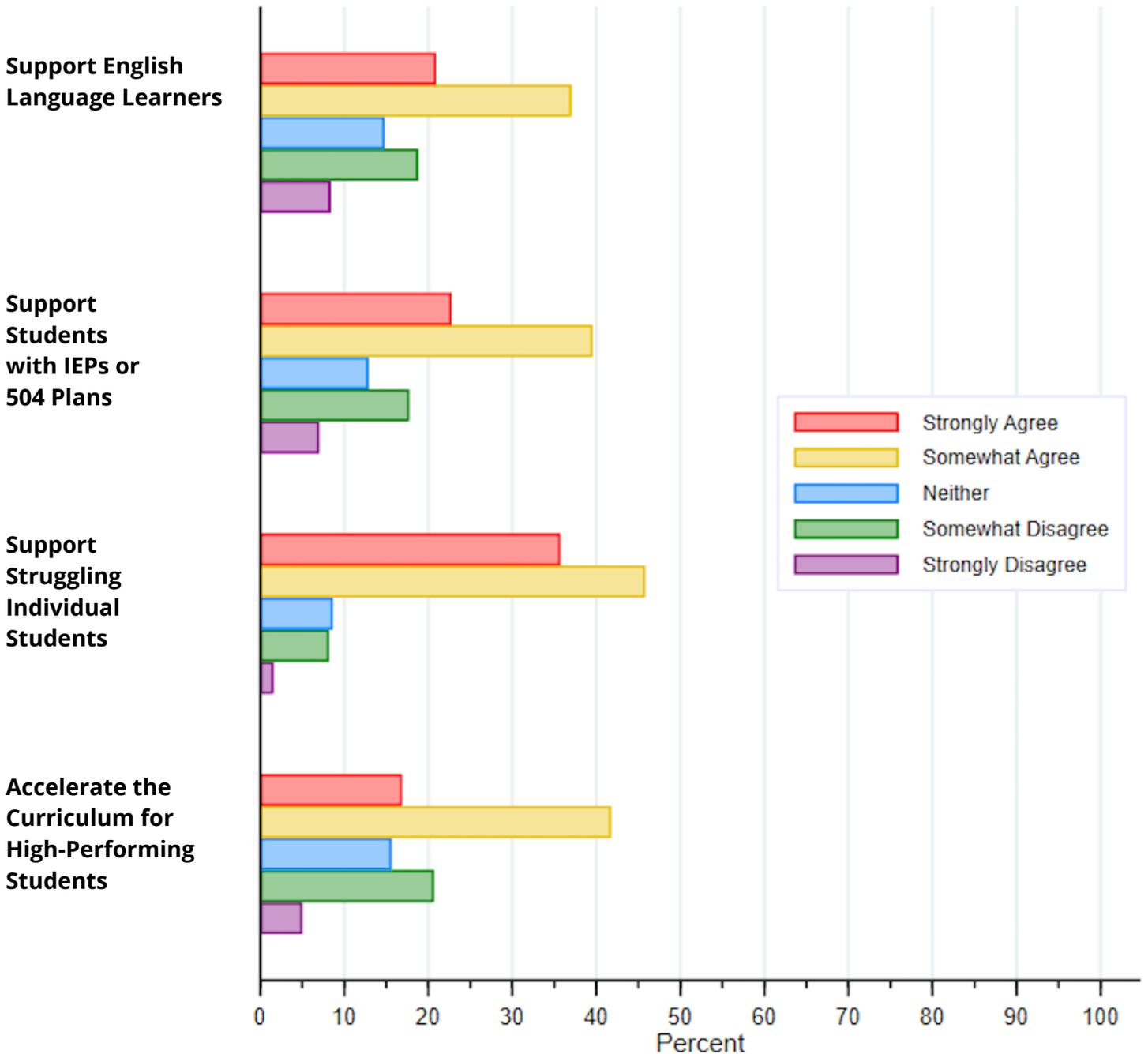
Teachers were asked questions about the coherence between three experiences: their teacher education program, student teaching, and their current school of employment. They were asked if the vision of good subject teaching in their STEM subject in one experience was similar to the vision of good subject teaching in another experience.



RATE HOW WELL YOUR STUDENT TEACHING EXPERIENCE PREPARED YOU TO:



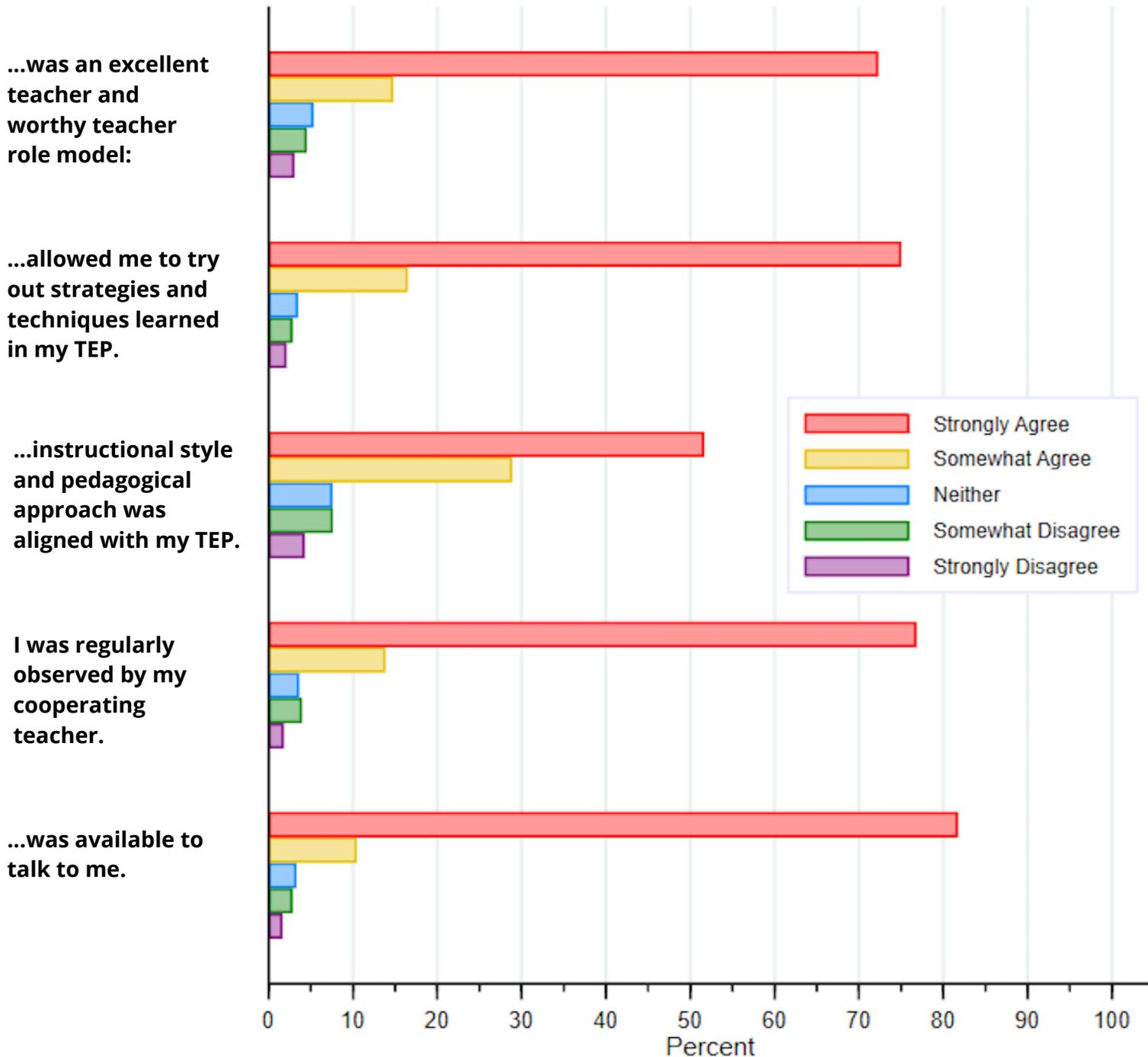
RATE HOW WELL YOUR STUDENT TEACHING EXPERIENCE PREPARED YOU TO:



IN THINKING ABOUT THE SUPERVISION AND FEEDBACK THAT YOU RECEIVED DURING YOUR STUDENT TEACHING PLACEMENT,

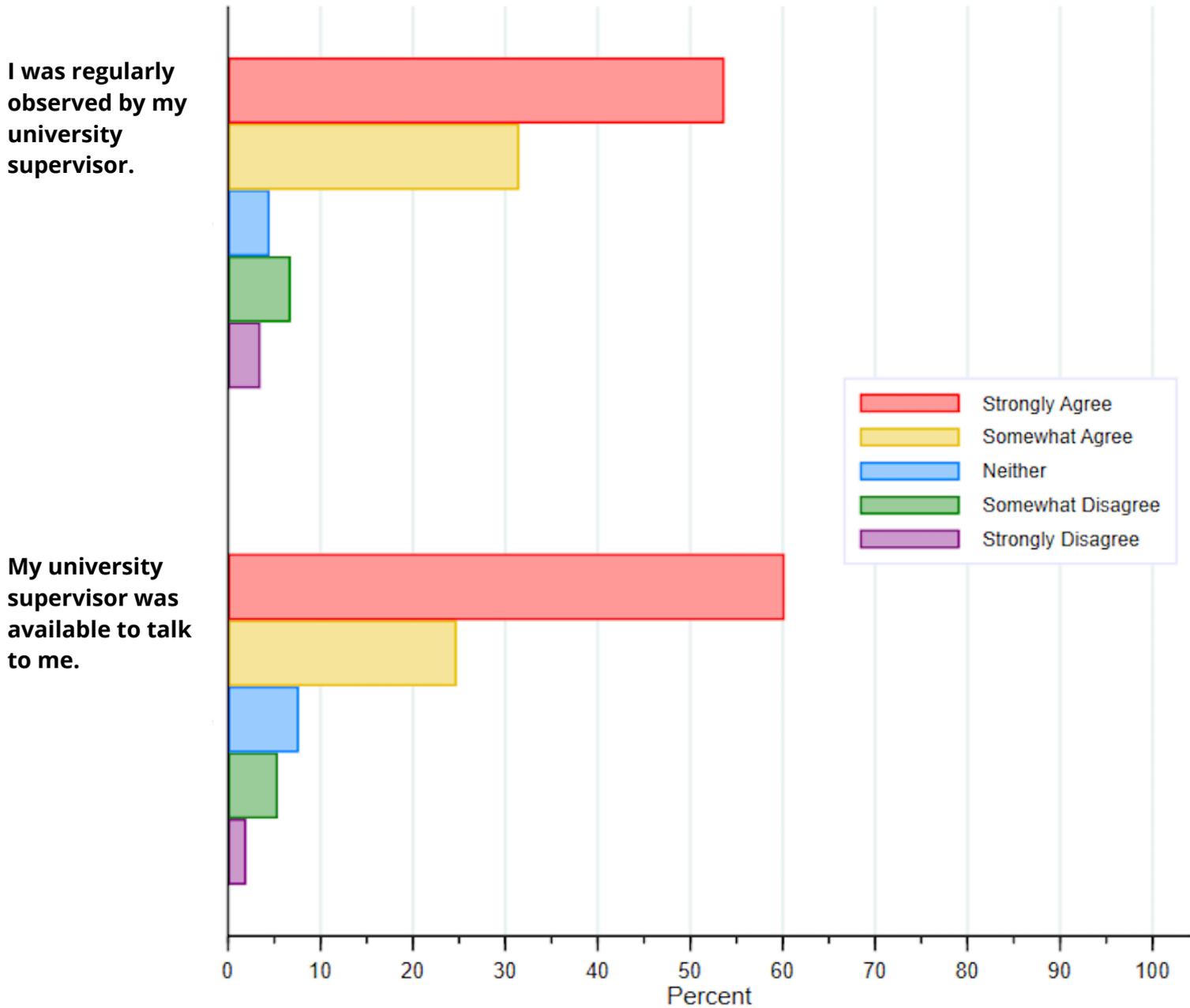
Please rate the extent to which you agree with the following statements:

My cooperating teacher...



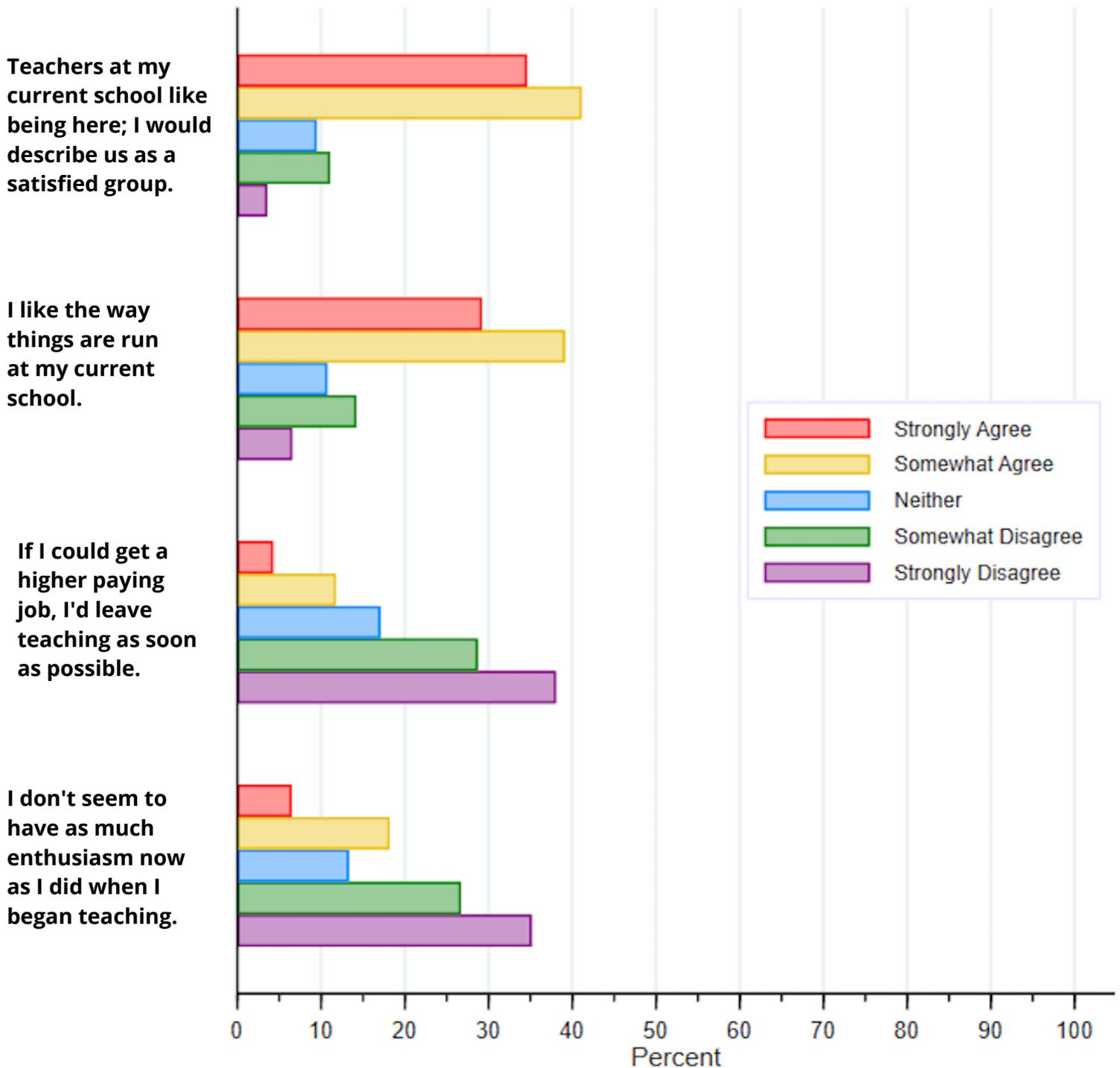
IN THINKING ABOUT THE SUPERVISION AND FEEDBACK THAT YOU RECEIVED DURING YOUR STUDENT TEACHING PLACEMENT,

Please rate the extent to which you agree with the following statements:



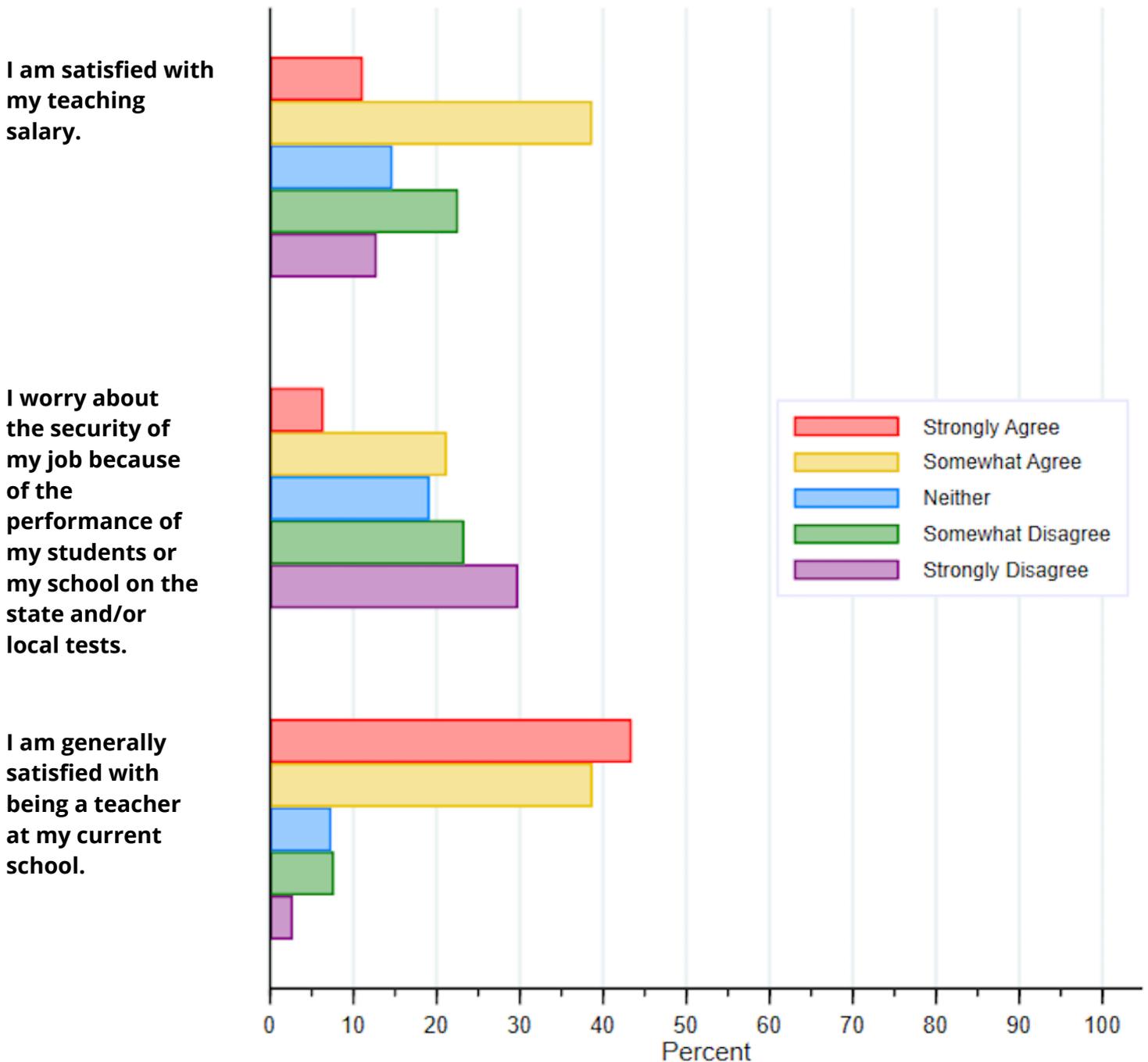
STATEMENTS ABOUT SCHOOL WORK ENVIRONMENT AND COMPENSATION

Please rate the extent to which you agree with the following statements:



STATEMENTS ABOUT SCHOOL WORK ENVIRONMENT AND COMPENSATION (CONT.)

Please rate the extent to which you agree with the following statements:



NEXT STEPS

We will compare how early-career STEM teachers in different school environments feel about their teacher preparation experiences, and the extent to which teachers' survey responses predict outcomes like student achievement and teacher retention. Stay tuned to both the Center for Education Data & Research (CEDR.us) and Teacher Education Learning Collaborative (TELC.us) websites for further updates.





REFERENCES

Boyd, D. J., Grossman, P. L., Lankford, H., Loeb, S., & Wyckoff, J. (2009). Teacher preparation and student achievement. *Educational Evaluation and Policy Analysis*, 31(4), 416-440.

Goldhaber, D., DeArmond, M., & DeBurgomaster, S. (2011). Teacher attitudes about compensation reform: Implications for reform implementation. *ILR Review*, 64(3), 441-463.

Goldring, R., Gray, L., & Bitterman, A. (2013). Characteristics of Public and Private Elementary and Secondary School Teachers in the United States: Results from the 2011-12 Schools and Staffing Survey. *First Look*. NCES 2013-314. National Center for Education Statistics.
