



DEFINING AND MEASURING

DIVERSITY, EQUITY, AND INCLUSION

IN ADVANCED TECHNOLOGICAL EDUCATION (ATE) CONTEXTS

INTRODUCTION

On June 25, 2020, EvaluATE sent the annual Advanced Technological Education (ATE) Evaluator Survey via Qualtrics to 210 ATE evaluators¹. The purpose of the diversity, equity, and inclusion (DEI) subsection of the survey was to examine how evaluators define and measure equity, diversity, and inclusion in their projects funded by the National Science Foundation's ATE program.


QUESTION

The following research question guided this project:

How are ATE evaluators currently defining and measuring diversity, equity, and inclusion (DEI) in their evaluation practices?

The definitions of the three constructs or key terms, according to the National Academies of Sciences, Engineering, and Medicine (NAS) are as follows:

DIVERSITY

Differences among individuals, including  demographic differences such as gender, race, ethnicity, and country of origin.


EQUITY

Fair distribution of opportunities to participate and succeed in education for all students.

INCLUSION

Processes through which all students/participants are made to feel welcome and are treated as motivated learners.

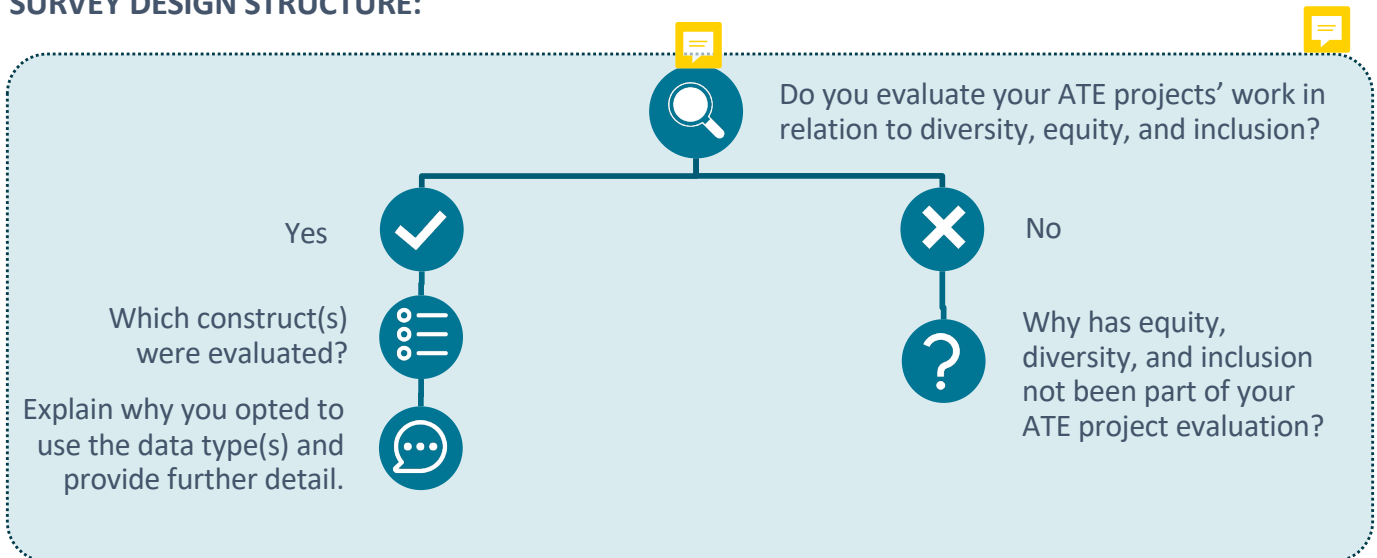
¹Three evaluators indicated that they were no longer active ATE evaluators, reducing our initial population to 207 ATE evaluators.

 ²National Academies of Sciences, Engineering, and Medicine. (2018). Indicators for monitoring undergraduate STEM education. The National Academies Press.

METHODS

The survey began by asking evaluators whether they evaluated their ATE projects' work in relation to diversity, equity, and inclusion. If the participant selected no, then they were asked why evaluating diversity, equity, and inclusion had not been part of their ATE project evaluation. If the participant selected yes, then they were asked to identify which construct(s) they evaluated, and for each construct selected, they then identified the type(s) of data they used for evaluating that construct. Participants were also asked, for each construct, to explain why they opted to use the data type(s), and to provide further detail. We asked those who did not identify having evaluated a particular construct why that construct had not been part of their ATE project evaluation. The survey concluded with various demographic questions, including race/ethnicity, gender, and education level.

SURVEY DESIGN STRUCTURE:



ANALYSIS

The evaluation team ran frequencies and cross-tabulations in SPSS to understand the quantitative findings. The tables and corresponding charts are in the appendix of this report. The evaluation team then collected the qualitative data and thematically coded the data to identify salient themes among the responses.

DATA ANALYSIS METHODS:



Frequencies



Cross-tabulations



Thematically coded



PARTICIPANTS

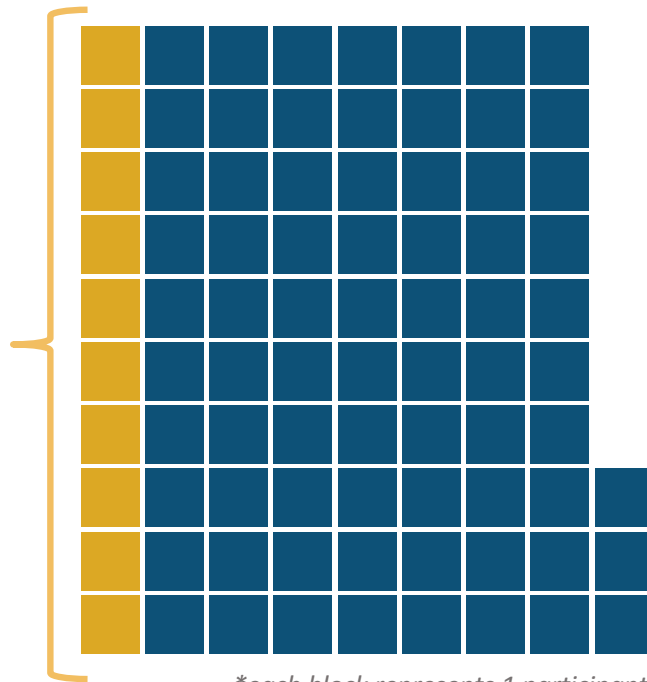
A total of 83 participants completed the survey. The majority of participants (59.5%) reported having doctoral degrees. In addition to STEM education, 43.5% of the respondents reported they evaluate higher education programs (see figure 1 below). Finally, 87.4% of the respondents identified themselves as White/East European.

83 participants

completed the survey

12.6% of
participants

Identified as **NOT**
White/East
European



Which of the following best describes your place of employment as an evaluator?

n=83

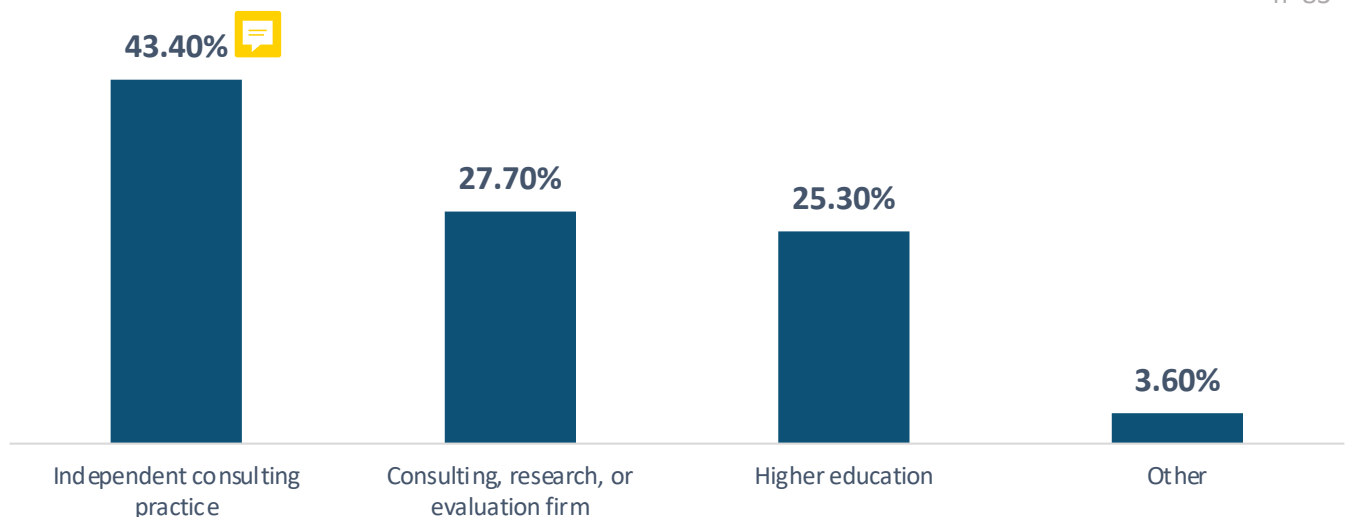


Figure 1. Place of Employment

KEY FINDINGS

In response to the first question, 86.8% (n = 79) of the participants reported they evaluate their ATE projects' work related to diversity, equity, and/or inclusion.



We asked the 12 individuals (13.2%) who reported they did not evaluate DEI in their projects the multiple-choice question, "Why has evaluating equity, diversity, and inclusion not been part of your ATE project evaluation?" The group's responses varied, with a majority selecting These issues are not relevant to the project or Project personnel have not requested this type of information. Figure 1 gives an overview of their responses.

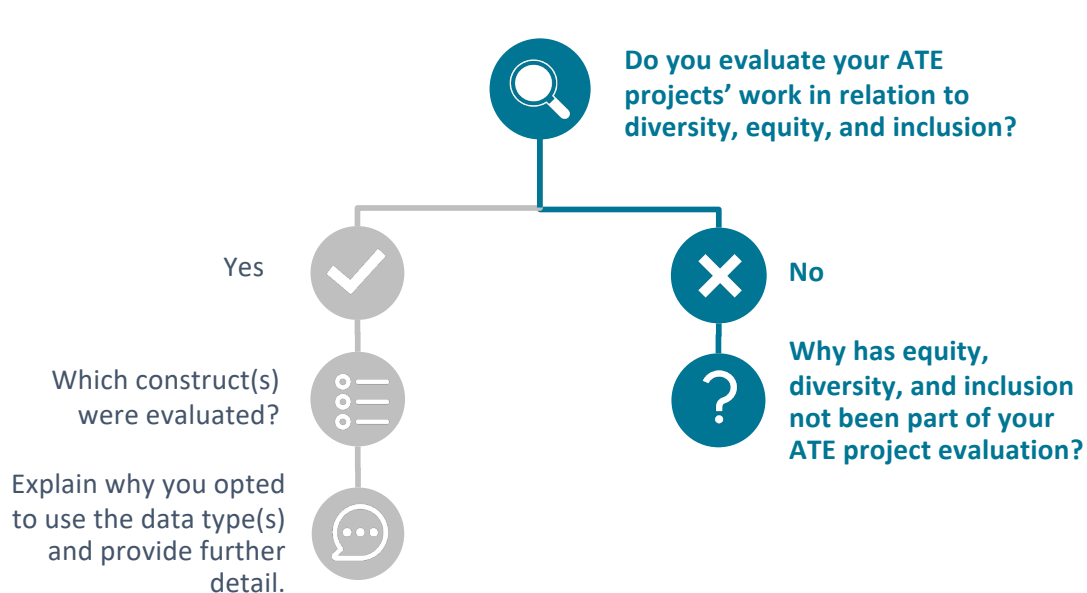
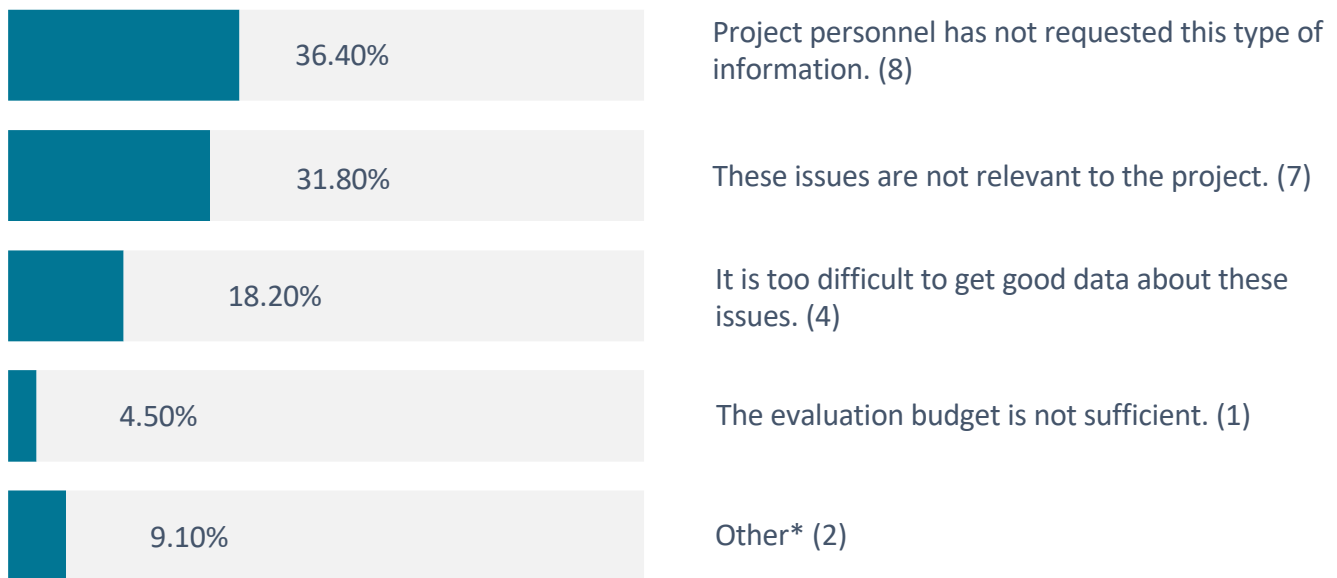


Figure 2.

KEY FINDINGS cont.

Why has evaluating equity, diversity, and inclusion not been part of your ATE project evaluation?

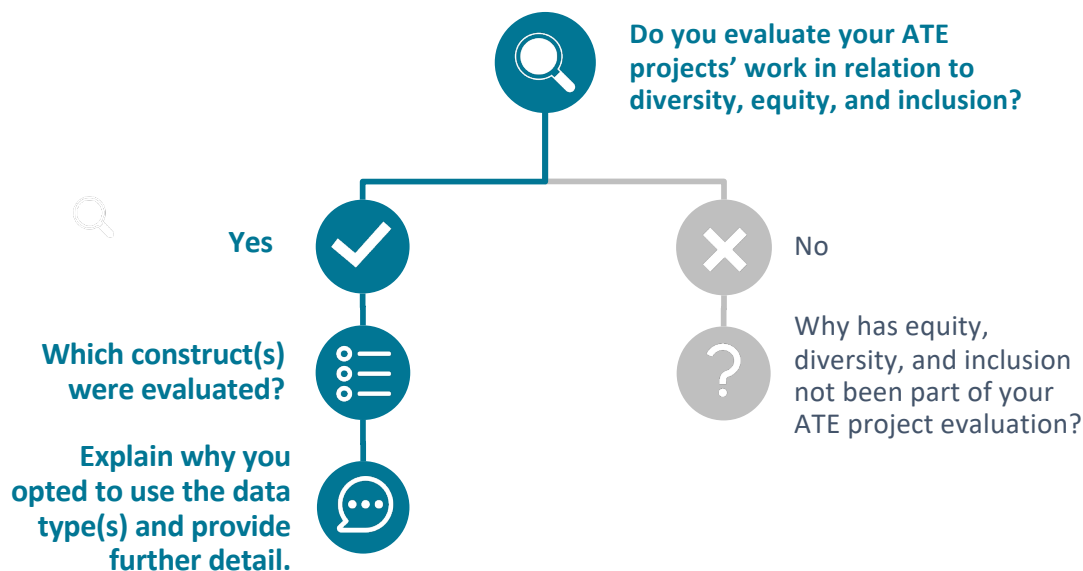


“I work on a research project that focuses on faculty & curriculum issues, not students.”

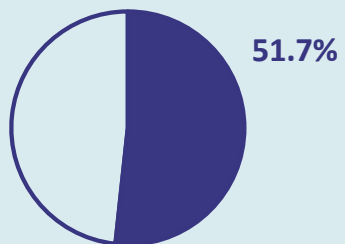
“Was not part of the objectives of this project. I have evaluated it on other projects, just not this one.”

KEY FINDINGS cont.

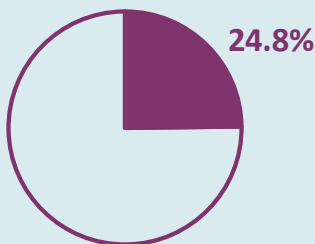
The remainder of the survey findings describe only those evaluators who indicated that they measured at least one of the three constructs in their ATE projects. Below, we present the findings relevant to each of the three constructs (diversity, equity, and inclusion) in turn.



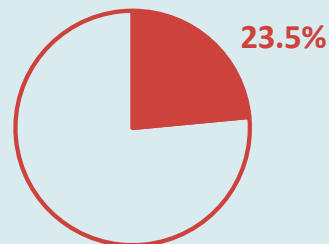
DIVERSITY



EQUITY



INCLUSION



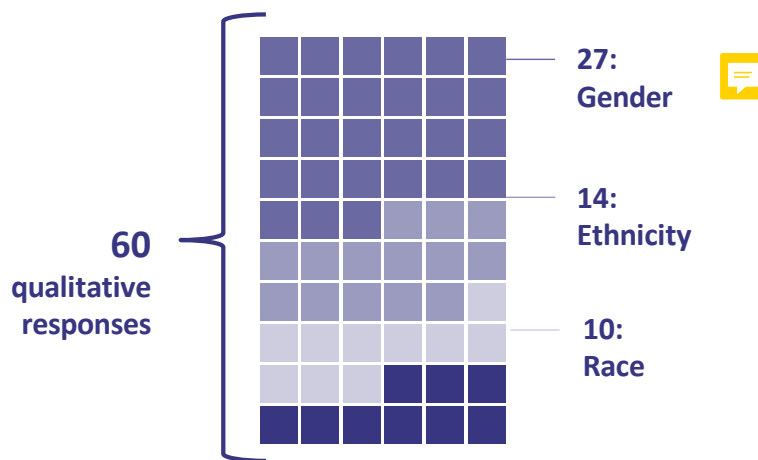
KEY FINDINGS cont.

DIVERSITY

Of those who measured DEI, diversity was the highest reported construct measured by evaluators, at 51.7% (n = 75). This was further evidenced by the number of responses to the open-ended questions for diversity compared to the other two constructs. The total number of qualitative responses for equity and inclusion was less than half the total responses for diversity. We asked the participants to explain the types of data they selected, and the qualitative responses regarding the diversity construct showed a common theme of demographics, with a focus on gender, ethnicity, and race. The participants highlighted gender 27 times out of the total 60 qualitative responses. Ethnicity appeared 14 times, and race appeared 10 times in the open-ended responses. A respondent stated:

For diversity I think of gender and under-represented minority presence which requires very little to verify.

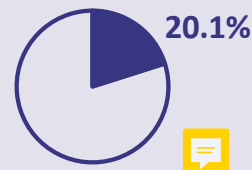
Participants identified gender, ethnicity, and race when asked about types of data they selected.



Of the respondents who measured diversity, the highest reported data collection tool used was surveys at 20.1%. One participant explained the rationale for measuring diversity with surveys as a way to:

...ascertain the extent to which participants across diverse groups are represented.

The highest reported data collection tool used was surveys.



KEY FINDINGS cont.

DIVERSITY cont.

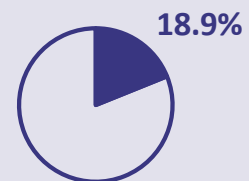
Several other participants reported that surveys help understand the “how” and the “why” of topics concerning diversity. One noted:

I collected survey data from students to capture how students self-identify in various diversity categories. When there is something more specific in the project goals and objectives, survey questions are designed to explore attitudes, perceptions, experiences, etc. in greater depth.

Institutional data was the second most frequently reported data collection tool used to measure diversity, at 18.9% (n = 49). Many of the respondents argued that institutional data was reliable and served as a catalyst for foundational knowledge. One respondent even reported that, without that knowledge, measuring diversity would be difficult:

The challenge for me is that measuring progress on diversity takes having baseline data/information, which is sometimes difficult to get. However, I find that the use of institutional data and surveys tends to give me the best approach to measuring changes in diversity over time.

The second most frequently reported data collection tool was Institutional data.



Another respondent confirmed the need for baseline/foundational knowledge:

If a goal of the project is to increase the number of underrepresented students, I need to have baseline data and data collected over subsequent years of the project. Data includes enrollment and completion of degrees and certificates.

Other respondents highlighted the rationale for the use of institutional data. One said:

Institutional data provides information about student populations being served by the ATE projects, and whether projects are on target to reach students, especially underrepresented students in STEM.

KEY FINDINGS cont.

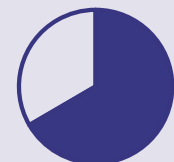
DIVERSITY cont.

Respondents' selection of data collection tools to measure diversity may have been impacted by the resources available to them. Surveys and institutional data are typically inexpensive compared to other types of data, like case studies. One respondent stated:

Surveys and institutional data are the only types of data that I am able to collect and analyze with the small amount of money available for the evaluation.

Sixty-six percent of the total respondents stated that diversity has not been a part of their ATE project evaluations because the project personnel have not requested this type of information.

Project personnel have not requested this type of information in evaluations.



66.6%

However, even some of the respondents who reported that they do measure diversity are having trouble utilizing the information to its fullest potential. A respondent stated that:

We collect the data, but we really haven't done much else with it yet. This is an area of interest that will be explored during this grant award.

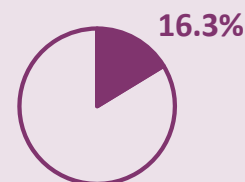
KEY FINDINGS cont.

EQUITY

Of those who measure DEI, 24.8% expressed that they measure equity in their ATE projects. According to the survey's quantitative results, the respondents selected surveys as the highest reported data collection tool used to measure equity at 16.3%. The evaluation team asked the respondents to elaborate on the types of data they selected to measure equity. The word "survey" appeared in the open-ended responses a total of 17 times out of 28 responses. The respondents elaborated that those surveys include student surveys, professional development surveys, opt-out surveys, and post-surveys. As one of the respondents reported:

Surveys are administered to participants, educators, and project partners. These data are used to determine who the program is reaching and to help the project team ensure that it's reaching all potential participants (rather than a select few).

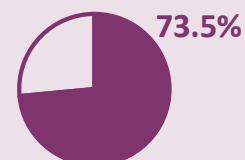
The highest reported data collection tool used was surveys.



The respondents reported institutional data as the second most commonly used data source (73.5%) for measuring equity. Those who mentioned institutional data also discussed other types of data they used to measure equity. Many of the respondents who reported using institutional data selected more than one method of data collection. One particular respondent emphasized the importance of incorporating several types of data to measure equity.

The rationale for taking a multi-faceted approach to data collection is to be comprehensive and inclusive. The people being served by the program—students, as well as program implementers and PIs—are included.

The second most frequently reported data collection tool was Institutional data.



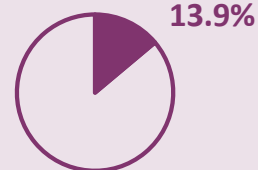
KEY FINDINGS cont.

EQUITY cont.

In addition to surveys and institutional data, 13.9% of the respondents found interviews important in measuring equity. One of the respondents highlighted the focus of gender equity in their particular ATE project and stated:

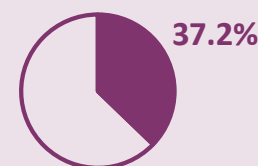
Interviews, or rather conversations, with the Co-PIs about what they are doing and why is important as a check on their awareness of equity concerns—especially in relation to gender equity, since most students are Latinx (as are the two co-PIs).

Interviews were found important in measuring equity by some projects.



Of those who reported not measuring equity in their various ATE projects, 37.2% stated that their project personnel had not requested information about equity.

Project personnel have not requested this type of information in evaluations.

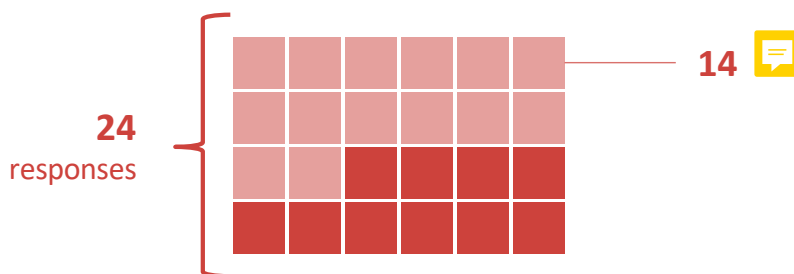


KEY FINDINGS cont.

INCLUSION

Of those who measure DEI, 23.5% expressed that they measure inclusion in their ATE projects. Fourteen of the 24 responses (a response rate of 58.3%) stated the overall importance of measuring inclusion was to better understand the students' perspectives, feelings, and opinions about their ATE programs. Three respondents also mentioned triangulation of the data.

Participants stated the overall importance of measuring inclusion was to better understand the students' perspectives, feelings, and opinions about their ATE program.



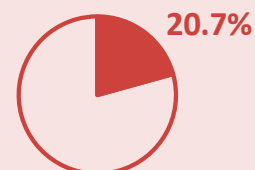
Several respondents discussed the types of data used to measure inclusion in their qualitative responses. Surveys were the most frequently reported type of data, at 20.7%. One of the respondents stated:

...Administering surveys to students allows us to learn more about the backgrounds and characteristics of students participating in the field of STEM. Project documents help us triangulate this information.

Another respondent stated:

The surveys are designed to measure changes in students' sense of belonging and science identity, in other words, to what extent is the project impacting (increasing) students' beliefs about how inclusive the STEM experiences are.

The highest reported data collection tool used was surveys.



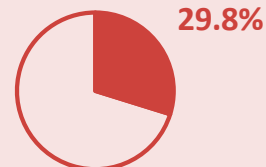
KEY FINDINGS cont.

INCLUSION cont.

The second and third most reported types of data used to measure inclusion were interviews (15.7%) and focus groups (14.1%), respectively. Respondents felt that interviews enabled the evaluators to interpret the program participants' feelings and perceptions regarding their perceived inclusion. One respondent stated:

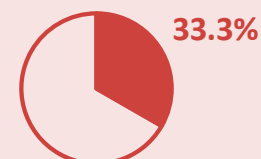
I find inclusion is more a perception, so we tend to use interviews and surveys. The results are subjective, of course, but provide some insight into how folks perceive inclusion from a personal level.

Interviews and focus groups were used to measure inclusion in some projects.



Of those who reported not measuring inclusion in their ATE projects, 33.3% noted that their project personnel had not requested information about inclusion.

Project personnel have not requested this type of information in evaluations.



CONCLUSIONS & LIMITATIONS

Overall, many more participants indicated that they measured diversity than equity and inclusion. Surveys were the most frequently reported data collection tool used across all constructs, which may be due to their budget-friendliness or the opportunity they present for a mixed-method approach, as mentioned by participants. For all three constructs, interviews were the second- or third-most-frequently reported data collection tool used. The respondents commented that the conversational nature of interviews was a beneficial component for measuring these various constructs.

Although the survey listed the three constructs' definitions according to NAS, we noted a possible concern about the participants' comprehension of diversity, equity, and inclusion. When asked to elaborate on the type(s) of data used to measure each construct, there were $n = 4$ occurrences of the phrase "please see previous comment." This quote is important to highlight because the participants were using the same explanation for more than one construct. This could indicate that the participants did not clearly understand the definitions of the three constructs, or this could mean they mistakenly think that they can all be evaluated in the same way. Thus, the participants could be subconsciously grouping the terms together, thinking they are interchangeable.

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Appendix

Table 1. Why has evaluating equity, diversity, and inclusion not been part of your ATE project evaluation?

	Frequency	Valid Percent
Project personnel have not requested this type of information	8	36.4%
These issues are not relevant to the project	7	31.8%
It is too difficult to get good data about these issues	4	18.2%
Other*	2	9.1%
The evaluation budget is not sufficient	1	4.5%
Total	22	100%

*"I work on a research project that focuses on faculty & curriculum issues, not students"

"Was not part of the objectives of this project. I have evaluated it on other projects, just not this one."

Table 2. Across all of your ATE evaluation projects for ATE, do you evaluate the project's work related to equity, diversity, and/or inclusion?

	Frequency	Valid Percent
Yes	79	86.8%
No	12	13.2%
Total	91	100%

Table 3. Which dimensions do you evaluate?

	Frequency	Valid Percent
Diversity	75	51.7%
Equity	36	24.8%
Inclusion	34	23.5%

Total	145	100%
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Table 4. Equity: Fair distribution of opportunities to participate and succeed in education for all students. What types of data do you use for evaluating *equity*?

	Frequency	Valid Percent
Surveys	27	16.3%
Institutional data	25	15.1%
Interviews	23	13.9%
Project records	19	11.5%
Observations	18	10.8%
Focus groups	17	10.2%
Course evaluations	12	7.2%
Assessments of student learning	11	6.6%
Case studies	9	5.4%
Other*	5	3.0%
Total	166	100%

*Classroom materials/curriculum, guitar building institute applications, demographic data, artifacts, marketing materials

Table 4. *Diversity*: Differences among individuals, including demographic differences such as gender, race, ethnicity, and country of origin. What types of data do you use for evaluating *diversity*?

	Frequency	Valid Percent
Surveys	52	20.1%
Institutional data	49	18.9%
Project records	39	15.1%

Interviews	27	10.4%
Observations	24	9.3%
Focus groups	22	8.5%
Assessments of student learning	19	7.3%
Course evaluations	17	6.6%
Case studies	6	2.3%
Other*	4	1.5%
Total	259	100%

*Teacher/classroom materials, institutional research data, demographics, artifacts and agreed upon evidence

Table 5. *Inclusion*: Processes through which all students/participants are made to feel welcome and are treated as motivated learners.

	Frequency	Valid Percent
Surveys	25	20.7%
Interviews	19	15.7%
Focus groups	17	14.1%
Observations	13	10.7%
Project records	13	10.7%
Institutional data	11	9.1%
Course evaluations	8	6.6%
Case studies	7	5.8%
Assessments of student learning	5	4.1%
Other	3	2.5%
Total	121	100%

*Teacher classroom materials, marketing materials, artifacts and other agreed upon evidence

Table 6. Why has evaluating *equity* not been part of your ATE project evaluation?

	Frequency	Valid Percent
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Project personnel have not requested this type of information	23	37.2%
Equity issues are not relevant to the project	11	17.7%
It is too difficult to get good data about equity	11	17.7%
Other*	9	14.5%
The evaluation budget is not sufficient	8	12.9%
Total	62	100%

*"It was not an explicit part of my understanding of the ATE project at that time."

"While the project team is cognizant of the need for different types and levels of support they give to their students and trainees, examining that aspect has not been part of the evaluation."

"There are no project activities focused on creating change in this area so the evaluation isn't measuring it."

"My observation is that equity is assumed by project personnel and therefore not included in a specific goal or objectives. For this reason, it does not become part of the evaluation plan that is based on project goals and objectives."

"Not a specific project goal"

"I think it's greater more consciousness around this and ensuring that this is represented in the logic model. Even though it is true that the project personnel has not asked to focus on this, however, I believe that we should be initiating the conversation around this topic and helping to communicate why this should be measured."

"Either not clear on the difference between equity and diversity, or the reason for our evaluation of diversity is to support equity. Our definition of diversity may include some elements of equity, as the presumed target is to involve all groups more or less equally in the STEM workforce (or, at least, to give equal opportunity, which includes support systems and outreach)."

"Would like to learn more about how others have included equity in evaluation. We typically hear from ATE projects a focus on diversity and sometimes inclusion, but not as often focused on equity."

"The program is open enrollment and it is too difficult to get data about equity."

Table 7. Why has evaluating *diversity* not been part of your ATE project evaluation?



	Frequency	Valid Percent
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Project personnel have not requested this type of information	4	50%
Other*	2	25%
The evaluation budget is not sufficient	1	12.5%
Diversity issues are not relevant to the project	1	12.5%
It is too difficult to get good data about diversity	0	0%
Total	8	100%

*Uncertain if student level data is accessible

Table 8. Why has evaluating *inclusion* not been part of your ATE project evaluation?

	Frequency	Valid Percent
Project personnel have not requested this type of information	22	33.3%
The evaluation budget is not sufficient	13	19.7%
Other*	13	19.7%
Inclusion issues are not relevant to the project	10	15.2%
It is too difficult to get good data about inclusion	8	12.1%
Total	66	100%

*"I would like to have more information about evaluating for inclusion. I have a hard time distinguishing it from equity in an evaluation, yet I recognize they are distinctive."

"What is it that you mean by "inclusion" again?"

"It was not an explicit part of my understanding of the ATE project at that time."

"There are no project activities focused on creating change in this area so the evaluation isn't measuring it."

"Not a specific project goal"

"Inclusion is considered as recommendation for how groups are represented in marketing tools and the reach to share information across groups which should then increase the diversity. So prob should have indicated as such"

"I think it's greater more consciousness around this and ensuring that this is represented in the logic model. Even though it is true that the project personnel has not asked to focus on this, however, I believe that we should be initiating the conversation around this topic and helping to communicate why this should be measured."

“The whole project is focused on supporting underrepresented populations”

“Same as above, our evaluation of diversity could be considered evaluation of some aspects of inclusion. But others, such as the appropriateness of onboarding procedures for underrepresented groups, are things that project personnel have not requested, and which would increase the evaluation budget.”

“Uncertain if student level demographic data is accessible”

“The program began enrolling students in September 2019. It is open enrollment so it is too difficult and early in the process to get data about inclusion”

“I'm not sure what you mean. Are you referring to individual responses as to whether students feel "included" or not? My answers above are related to this interpretation of what you might mean by "inclusion.”

Table 9. What, if any, challenges have you faced when attempting to evaluate the project's work related to equity, diversity, and/or inclusion?

	Frequency	Valid Percent
Challenging data and measurement	6	31.6%
Small number/ underrepresented groups	3	15.8%
Project/grant staff think differently	3	15.8%
Other	3	15.8%
Different priorities	2	10.5%
NONE	2	10.5%
Total	19	100%

“I think there are a few challenges. First, some projects have an explicit focus on diversity in their proposals, but by the time the project is funded and in development and/or implementation, the project team has either forgotten about the focus on diversity or did not know. Specifically, I'm thinking about recruitment. I think it's hard to "convince" a project team to veer back on-track to this objective because they oftentimes then think it is too hard to reorient the project to be more equitable, diverse, and inclusive. Second, projects that have an explicit focus to recruit more diverse participants might be staking out on their own and developing/adapting new recruitment techniques that their institution have not embarked upon. In my experience, projects at these institutions that do not have a focus on recruiting from diverse student populations have a harder time meeting their targets for participants. Lastly, equity and inclusion require a little more time to properly assess, mainly

through student feedback. That seems like a mini hurdle to overcome when trying to make the case to a project team on why equity and inclusion are relevant to most projects.”

“Determine the variables that are most salient to tracking--for example, moving from perception to actual reality of improvements.”

Table 10. Have you ever been a principal investigator or co-principal investigator for an ATE or other National Science Foundation-funded project?

	Frequency	Valid Percent
No	47	56.0%
Yes	37	44.0%
Total	84	100%

Table 11. Which of the following best describes your place of employment *as an evaluator*?

	Frequency	Valid Percent
Independent consulting practice	36	43.4%
Consulting, research, or evaluation firm	23	27.7%
Higher education	21	25.3%
Other*	3	3.6%
Total	83	100%

*nonprofit, 50% higher ed; 50% independent consulting practice, I am the owner of an independent research and evaluation firm. So kind of both #2 and #3 above.

Table 12. In addition to STEM education, what types of programs do you evaluate? (Select all that apply.)

	Frequency	Valid Percent
Higher education	70	43.5%
K-12 education	41	25.5%
Community development	17	10.6%
Other*	13	8.1%

Business or industry	11	6.8%
Public health	7	4.3%
International development	2	1.2%
Total	161	100%

*library programs and urban plans, Arts Education, Military transition to civilian life, Arts and social circus, But most are connected to STEM; so was not sure how to answer this one, None...all have been STEM, public safety, Nonprofit requests for allocation of grant funds, Not-for-profits especially oriented to girls in STEM or underserved populations in STEM, Mostly with diverse communities, community ecology and planning project, medical research, Workforce development

Table 13. What is the highest level of education you have completed?

	Frequency	Valid Percent
Doctoral degree	50	59.5%
Master's degree	30	35.7%
Bachelor's degree	3	3.6%
Graduate coursework	1	1.2%
Graduate certificate	0	0%
Total	84	100%

Table 14. Not including the degree or coursework you already reported, have you participated in other types of formal or informal education related specifically to evaluation?

	Frequency	Valid Percent
Yes	71	84.5%
No	13	15.5%
Total	84	100%

Table 15. In what other types of evaluation-related education or training have you participated?

	Frequency	Valid Percent
Professional development workshops or webinars on evaluation	65	67.7%
Graduate coursework in evaluation	16	16.7%
Other*	11	11.4%
Degree program in evaluation (name of degree includes the word "evaluation")	2	2.1%
Certificate in evaluation	2	2.1%
Total	96	100%

*individual development, Baldrige Performance Excellence Program Examiner with annual training, reading in evaluation literature, Educational Specialists Degree (EdS)- Peer and administrator evaluator certification, Dissertation, Regular contributions to the literature, Personal research and learning via AEA and other sources, Training in Excel and R, working with a mentor, Reviews of eval research articles- eval reports- and relevant literature, All workshops/webinars have been conducted by or sponsored by EvalUATE.

Table 16. Which of the following best describes your racial or ethnic identity or identities? (Select all that apply.)

	Frequency	Valid Percent
White/Eastern European	76	87.4%
Other*	4	4.6%
Asian/East Asian/Indian	3	3.4%
Black/African-American/African/Caribbean	3	3.4%
Latinx/Hispanic	1	1.2%
Hawaiian/Pacific Islander	0	0%
Middle Eastern	0	0%
Native American/Alaska Native/Indigenous	0	0%

Total	87	100%
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*German-American, White/Western European :), TCK (Third culture kid)