EAB

Measuring K-12 Students' Soft Skills

Metrics on Cultural Awareness and Cultural Empathy, Teamwork and Collaboration, Communication, and Environmental Stewardship

District Leadership Forum

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1) Executive Summary

Key Observations

Cultural Awareness and Cultural Empathy (pages 8-10)

Employ assessments that holistically measure students' cultural awareness and cultural empathy skills. Psychologists state that it is more important for students to learn how to view situations and events from the perspective of another culture (i.e., cultural empathy), rather than only learn content knowledge about other cultures (i.e., cultural awareness). To that end, administrators can use the Global Empathy Scale to measure students' ability to understand the world from another culture's perspective. Administrators can also assess how students interact with students from other cultures and how students understand other individual student perspectives via the Assessment of Social Perspective-Taking Performance.

Teamwork and Collaboration (pages 11-13)

Deploy teamwork and collaboration metrics to minimize time spent taking assessments. Administrators can either ask teachers to complete student teamwork-skill evaluations or ask students to complete self-assessments on student teamwork skills. Administrators can give Wang et al.'s (2009) holistic assessments to either students or teachers to evaluate students' communication skills depending on their district's specific time burdens (e.g., if students spend too much time on assessments, deploy teacher evaluations). Ideally, administrators should deploy assessments to both students and teachers. If administrators rely on student self-assessments alone, students' inflated views of their own performance may bias assessment results. Similarly, if administrators rely on teacher assessments alone, teacher bias against individual students may impact results.

Communication (pages 14-17)

Assess both verbal and writing competence to track students' communication skills. Administrators can use two separate assessments (e.g., the Personal Report of Communication Apprehension, the Writing Apprehension Test) to measure students' verbal and written abilities communication abilities, respectively. Student assessments like these not only help administrators gauge students' overall communication skills, but also allow students to see and understand what criteria teachers use to grade their communication skills. For example, if a student must indicate whether or not she gets tense or rigid when she speaks in front of the class on an assessment, she knows that teachers may evaluate her on body language during a presentation.

Environmental Stewardship (pages 18-22)

Ensure students achieve the sequential goals that contribute to environmental stewardship. Administrators can use the environmental literacy ladder from Planet Blue at the **University of Michigan** to track student progress towards environmental stewardship. The environmental literacy ladder accounts for five stages of developing environmental stewardship in students: 1) environmental awareness, 2) environmental knowledge, 3) attitudes toward the environment, 4) skills necessary to address environmental issues, 5) action to address environmental concerns (i.e., environmental stewardship). By measuring student performance on different rungs of the environmental literacy ladder, administrators can assess how students' environmental knowledge and attitudes towards sustainability translate into actions related to environmental stewardship.

2) Overview

Motivation

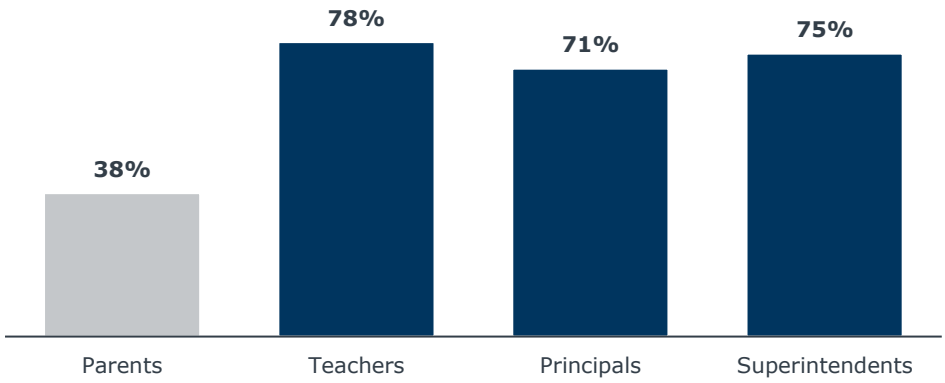
Administrators Should Allocate Time for Accurate Soft Skills Assessment

Students need nonacademic (i.e., soft) skills—non-field specific skills such as critical thinking, teamwork, and time management.[1] A survey conducted by Hart Research Associates in 2015 found 60 percent of employers said college students need both field-specific skills and soft skills to succeed in their careers.[2] Additionally, in a review of research on soft skills, Heckman and Kautz (2012) find student soft skills development predicts future career and academic outcomes.[3] Students cannot start to develop soft skills in college alone—they must learn and develop soft skills throughout their K-12 education. Administrators who wish to help students develop nonacademic skills must find a way to measure student performance on non-academic skills and target interventions accordingly.

In a 2016 Gallup and Northwest Evaluation Association (NWEA) national poll of parents, teachers, principals, and superintendents, only about 10 percent of teachers stated that their schools or school districts measure students' soft skills "very well."[4] Participants identified accepting different opinions (e.g., opinions of students from other cultures), collaboration skills, and communication skills as key interpersonal/soft skills that teachers should teach and administrators should measure.

Though various school stakeholders agree that school administrators should assess student soft skill development, they worry students often spend too much time taking assessments. Although 38 percent of parents think students spend too much time taking assessments, over 70 percent of teachers and school administrators think students spend too much time on both academic and non-academic assessments (see the below graph on **page five**). Administrators need to identify soft skill metrics that do not take extensive time for students and/or teachers to complete.

Percentage of Stakeholders Who Think Students Spend Too Much Time Taking Assessments[5]



1) Alison Doyle, "What Are Soft Skills," *The Balance Careers*, last updated January 2, 2020, https://www.thebalancecareers.com/what-are-soft-skills-2060852
2) "Falling Short? College Learning and Career Success" (Washington, DC: Hart Research Associates, January 20, 2015), https://www.aacu.org/sites/default/files/files/LEAP/2015employerstudentsurvey.pdf.
3) James J. Heckman and Tim Kautz, "Hard Evidence on Soft Skills," *Labour Economics* 19, no. 4 (2012): 451–64, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3612993/?_escaped_fragment_=po=0.961538.
4) "Assessing Soft Skills: Are We Preparing Students for Successful Futures?" (Washington, DC: Gallup and NWEA, August 2018), 1, https://www.nwea.org/content/uploads/2018/08/NWEA_Gallup-Report_August-2018.pdf.
5) "Assessing Soft Skills: Are We Preparing Students for Successful Futures?," 14.

This Report Highlights Metrics to Assess Four Soft-Skill Categories

Assessments profiled in this report measure cultural empathy, teamwork and collaboration, communication, and environmental stewardship. While interviewees from the 2016 Gallup and NWEA poll did not mention environmental stewardship as a crucial student soft skill, environmental stewardship, like other soft skills, is associated with positive student outcomes. A review of research from **Stanford University** finds environmental education leads to better student academic outcomes (e.g., math, reading), increased confidence, improved leadership skills, and improvement in other soft skills.[6] Thus, this report considers metrics of environmental stewardship as well.

For each of the above four soft-skill categories, researchers identified two to four metrics administrators can employ. Researchers provided metrics for both primary and secondary students in all four skill categories so that administrators can choose to assess each skill in either primary grades, secondary grades, or both.

Each section of the report discusses one of the above four soft skills categories and highlights the rationale behind profiled metrics. In addition, the end of each section contains an overview of all suggested metrics for the section's profiled soft-skill category (**page 10** for cultural awareness and cultural empathy, **page 13** for teamwork and collaboration, **page 17** for communication, and **page 22** for environmental stewardship).

EAB researchers profiled metrics that met four criteria.

1. Researchers only considered free and publicly available metrics to ensure administrators can access these metrics.
2. Researchers prioritized time-efficient metrics to assess soft skills to help address concerns from teachers and administrators over student time spent on assessments. Thus, the report primarily profiles questionnaires over time intensive performance tasks.
3. Researchers picked internally consistent (see **pages six to seven** for more on internal consistency), theoretically backed metrics with supporting research.
4. Researchers selected metrics administrators can deploy through survey software (e.g., Qualtrics).

Our researchers made one exception to this criterion and included a metric without internal consistency measurements. The metric assesses young students on components of environmental stewardship: Canadian Parks and Wilderness Society (CPAWS) Student Questionnaire **(page 19)**.

The report also includes two knowledge-based questionnaires related to environmental stewardship. Researchers do not use Cronbach's alphas to measure internal consistency for knowledge-based assessments.

Further, the **RAND Education Assessment Finder** identifies and compares free and monetized assessments that administrators can use to measure students' intrapersonal, interpersonal, and cognitive skills. Administrators can find many of the assessments discussed in the report in the RAND Education Assessment Finder.

This Report Prioritizes Soft Skills Assessments with High Internal Consistency

Researchers employ reliability (i.e., internal consistency) coefficients to ensure their assessments consistently measure their desired focus. Cronbach's alpha (α) is a common internal consistency coefficient. Cronbach's alpha coefficients range from zero to one, and higher coefficients signal a more reliable metric. Researchers employ

6) "Stanford Analysis Reveals Wide Array of Benefits from Environmental Education" (Washington, DC: North American Association for Environmental Education), accessed February 19, 2020, https://cdn.naaee.org/sites/default/files/eeworks/files/k-12_student_key_findings.pdf.

alpha coefficients for survey instruments (e.g., "Circle which answer best describes your views towards foot insoles."), not for metrics assessing content knowledge (e.g., "What's the capital of Zambia?"). Administrator should employ assessment instruments with Cronbach's alphas higher than 0.70 to ensure these instruments consistently measure the subject they proport to measure.[7] This report thus primarily highlights metrics with Cronbach's alphas higher than 0.70. For more specifics on calculating Cronbach's alpha coefficients, please see the **University of Virginia** Library entry **Using and Interpreting Cronbach's Alpha**.

While Cronbach's alpha tests the reliability of a metric, alpha coefficients do not measure the validity of a measurement. For example, an administrator may wish to measure a student's public speaking skills with student shoe size. The alpha coefficient for the metric "shoe size" may exceed 0.70, but shoe size poorly measures public speaking skills. Students will likely accurately report their shoe size each time administrators ask them (i.e., shoe size is reliable), but shoe size poorly reflects a student's ability to publicly speak (i.e., not valid). Thus, the report considers alpha coefficients in tandem with the theoretical alignment between metrics and soft skills (i.e., how well do the assessment questions seem to reflect the targeted soft skill).

7) Yuping Liu, "Developing a Scale to Measure the Interactivity of Websites," *Journal of Advertising Research* 43, no. 2 (June 1, 2003): 207, https://doi.org/10.2501/JAR-43-2-207-216; Chelsea Goforth, "Using and Interpreting Cronbach's Alpha," University of Virginia Library Research Data Services + Sciences, November 16, 2015, https://data.library.virginia.edu/using-and-interpreting-cronbachs-alpha/.

3) Cultural Awareness and Cultural Empathy

Approach

Assess Students' Ability to View, Empathize With, and Understand Other Cultural Perspectives

Some administrators may think to measure students' content knowledge about other cultures (i.e., cultural awareness) when thinking about students' ability to interact with other cultures. However, while students do need to acquire this content knowledge, psychologists argue it is more important for students to learn how to view the world from the perspective of different cultures (i.e., acquire cultural empathy). Students who understand and empathize with other cultural perspectives can improve their engagement with diverse classmates and thus also improve their awareness of other cultures.[8] Cultural empathy includes three important sub skills, the last of which aligns with cultural awareness:

- Students learn how to view a problem through a different cultural lens.
- Students learn how to expose themselves to other people's suffering and express concern for their suffering.
- Students learn to ask questions and deepen their own understanding of other cultures (i.e., cultural awareness).[9]

Administrators who seek to measure students' ability to interact with other cultures should prioritize metrics that assess these three components of cultural empathy, rather than only assessing cultural awareness.

Metrics

Measure Students' Cultural Empathy at a Macro- and Micro-Level

Metrics that assess students' cultural empathy tend to either measure students' attitudes towards entire cultures (macro-level/abstract) or towards individuals from other cultures (micro-level/concrete). To measure both levels of cultural awareness and cultural empathy, administrators can deploy two different metrics (i.e., the Global Empathy Scale, the Assessment of Social Perspective-Taking Performance). Both metrics assess students on the three components of cultural empathy discussed above.

At the macro-level, administrators can employ the Global Empathy Scale (GES) to measure students' cultural empathy. The GES asks high school students to respond to 11 cultural empathy questions, including questions that focus on cultural awareness specifically.[10] Further, research from Wang et al. (2003) and Bachen et al. (2012) confirms the internal consistency of the metric. In experiments deploying the scale, the metric earned alpha coefficients greater than 0.82.[11] See the below graphic

The GES relies on a 6-point Likert scale to assess students. A Likert scale asks survey respondents to answer a question by selecting one response from a range of responses (e.g., "strongly agree, agree, disagree, strongly disagree). Researchers can numerically code these responses (e.g., "strongly agree" = 1) to quantitatively analyze survey results.

8) Yu-Wei Wang et al., "The Scale of Ethnocultural Empathy: Development, Validation, and Reliability," *Journal of Counseling Psychology* 50, no. 2 (2003): 221–34, https://doi.org/10.1037/0022-0167.50.2.221; Ha Yeon Kim et al., "Social Perspective-Taking Performance: Construct, Measurement, and Relations with Academic Performance and Engagement," *Journal of Applied Developmental Psychology* 57 (2018): 24–41, https://doi.org/10.1016/j.appdev.2018.05.005.
9) Wang et al., "The Scale of Ethnocultural Empathy: Development, Validation, and Reliability," 222.
10) Wang et al., "The Scale of Ethnocultural Empathy: Development, Validation, and Reliability."
11) Christine M. Bachen, Pedro F. Hernández-Ramos, and Chad Raphael, "Simulating REAL LIVES: Promoting Global Empathy and Interest in Learning Through Simulation Games," *Simulation & Gaming* 43, no. 4 (January 20, 2012): 437–60, https://doi.org/10.1177/1046878111432108; Wang et al., "The Scale of Ethnocultural Empathy: Development, Validation, and Reliability."

(page 9) for example questions from the Global Empathy Scale that theoretically relate to each component of cultural empathy.

Example Questions from the Global Empathy Scale[12]

Students learn to ask questions and deepen their own understanding of other cultures.	**Students learn how to view a problem through a different cultural lens.**	**Students learn how to expose themselves to other people's suffering and express concern for their suffering**
"I am aware of political, social, and economic barriers that lead to discrimination of people in other countries."	"I can relate to the frustration that some people of different countries feel about having fewer opportunities due to the economic, political, or social circumstances of their countries."	"I share the anger of those in other countries who face injustice because of their political or social (e.g., ethnic, racial, gender) background."

Diazgranados et al. (2016) originally called the metric the Social Perspective Taking Acts Measure (SPTAM). Kim et al. (2018) revised and renamed the metric to the ASPP.

To supplement the macro-level GES with a micro-level metric, administrators can use the Assessment of Social Perspective-Taking Performance (ASPP) to gauge cultural awareness and empathy within individual interactions. Initially developed by Diazgranados et al. in 2016 and refined by Kim et al. in 2018, the ASPP asks students to write a short free response answer to hypothetical social dilemmas.[13] The scenarios ask students how children in each scenario would react to bullying or teasing based on individual cultural differences. The graphic below highlights one example scenario from the ASPP.

12) Bachen, Hernández-Ramos, and Raphael, "Simulating REAL LIVES: Promoting Global Empathy and Interest in Learning Through Simulation Games," 456.
13) Silvia Diazgranados, Robert L. Selman, and Michelle Dionne, "Acts of Social Perspective Taking: A Functional Construct and the Validation of a Performance Measure for Early Adolescents," *Social Development* 25, no. 3 (2016): 572–601, https://projects.iq.harvard.edu/files/geii/files/sptm_social_development_silvia_diazgranados.pdf; Kim et al., "Social Perspective-Taking Performance: Construct, Measurement, and Relations with Academic Performance and Engagement."

The scenario comes from the original metric from Diazgranados et al. (2016). The revised scenarios by Kim et al. in the ASPP vary slightly from the original. This report highlights the original scenarios because school administrators can easily access them.

Example Scenario from the ASPP: Jariah's Weird Sense of Style[14]

You have lots of friends in your class this year and you are enjoying school. In January, your teacher introduces a new student to the class, **Jariah**, whose family arrived from a different far away city very recently. Jariah's hairstyle is strange. Also, no one in the class likes the music Jariah listens to. Some students are teasing Jariah because they think Jariah is weird. **Casey** is a student who has many friends and gets along with most classmates. Casey has been observing the situation and does not know what to do. Casey is asking different people for advice. What do you think **Ali** would recommend to Casey? Why do you think Ali would make that recommendation? What might go wrong with Ali's recommendation?

Researchers designed the ASPP for students in grades four through eight and find the assessment is internally consistent. It yields alpha coefficients between 0.66 and 0.82 (depending on the study).[15]

Of all the metrics mentioned in this report, the ASPP requires the most time to evaluate. Administrators must numerically code each student response for the nine scenarios. That said, by analyzing student responses to hypothetical scenarios, the ASPP allows administrators to understand how students will react to specific scenarios involving individual classmates from different cultures. Other assessments (e.g., GES) simply abstractly ask students if they respect or empathize with other cultures. The ASPP—though rigorous—thus complements the quick, more abstract GES.

Overview of Profiled Cultural Awareness and Cultural Empathy Assessments[16]

Assessment	Grade-Level	Internal Consistency	Number of Items (Total Time)	Format	Availability
Assessment of Social Perspective-Taking Performance (ASPP)	Grades 4-8	0.66≤α≤0.82	9 scenarios (45-60 minutes)	Free response	**Diazgranados et al. (2015)**; **pages 22-30** and response code book **pages 8-9**.
Global Empathy Scale (GES)	Grades 9-12	Pre-test α=0.825 Post-test α=0.872	11 statements (10-20 minutes)	6-point Likert scale	**Bachen et al. (2012)**: **page 456**.

14) Diazgranados, Selman, and Dionne, "Acts of Social Perspective Taking: A Functional Construct and the Validation of a Performance Measure for Early Adolescents," 23.
15) Diazgranados, Selman, and Dionne, "Acts of Social Perspective Taking: A Functional Construct and the Validation of a Performance Measure for Early Adolescents"; Kim et al., "Social Perspective-Taking Performance: Construct, Measurement, and Relations with Academic Performance and Engagement."
16) Bachen, Hernández-Ramos, and Raphael, "Simulating REAL LIVES: Promoting Global Empathy and Interest in Learning Through Simulation Games"; Diazgranados, Selman, and Dionne, "Acts of Social Perspective Taking: A Functional Construct and the Validation of a Performance Measure for Early Adolescents."

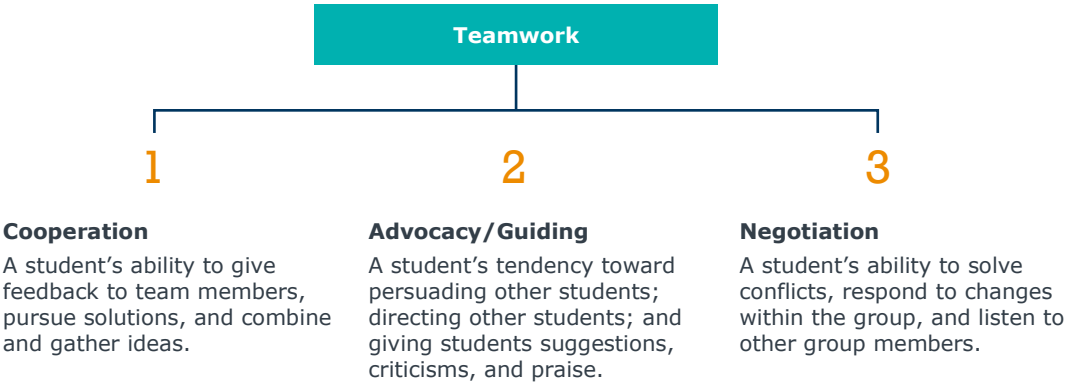
4) Teamwork and Collaboration

Approach

Measure Students' Ability to Cooperate, Guide Others, and Negotiate

Effective teamwork involves more than getting along with team members. When Wang et al. (2009) developed assessments to measure teamwork, they designed their assessments to capture three primary subcomponents of teamwork and collaboration: cooperation, advocacy/guiding, and negotiation. The below graphic **(page 11)** further dissects these subcomponents. Regardless if administrators choose to employ Wang et al.'s assessments, administrators should select assessments that measure these subcomponents to gain a more holistic assessment of students' teamwork and collaboration skills.

Wang et al.'s Subcomponents of Teamwork[17]



Metrics

Teamwork Assessments Include Student Self-Reports and Teacher Evaluations of Student Performance

Administrators concerned about the time students spend on assessments might consider employing metrics that do not require students to take an assessment. In these instances, administrators may ask teachers to fill out rubrics or other evaluations that rate the teamwork and collaboration performance of each student in their class. Conversely, if administrators rely on teacher evaluations to assess student skills too heavily, they risk overworking teachers. In those instances, administrators may consider assessing students directly.

In addition to time concerns, administrators can deploy teacher assessments if they worry about biased results in student assessments. Students may answer questions differently during assessments to "improve" their results. For example, a student may indicate she enjoys helping team members during group projects, but in reality detest group work. Teacher assessments on their own or alongside student self-assessments help ensure accurate measurements of student skills.

17) Lijuan Wang et al., "Assessing Teamwork and Collaboration in High School Students: A Multimethod Approach," *Canadian Journal of School Psychology* 24, no. 2 (June 2009): 116, https://journals.sagepub.com/doi/abs/10.1177/0829573509335470.

Wang et al. (2009) built three assessments to holistically measure teamwork. Ideally, administrators would employ all three measures to account for potential teacher and student bias in assessment responses. The Self-Report Scale and the Situational Judgement Task ask students to reflect on their own teamwork skills, while the Teacher-Report Scale asks teachers to assess students' teamwork skills.

The below graphic **(page 12)** highlights the best use of each assessment alongside example questions from each. The graphic also highlights a question from each assessment that address the three components of teamwork and collaboration above— cooperation questions from the Self-Report Scale, an advocacy question from the Teacher-Report Assessment, and a negotiation question from the Situational Judgement Tasks. All three metrics contain questions assessing all three components. Each assessment is internally consistent with an alpha coefficient greater than 0.70.[18]

Wang et al. (2009) Teamwork Assessments[19]

Self-Report Scale (Cooperation Example)

- "I act without consulting my group."
- "I seek to influence my peers."
- "I like to be in charge of groups or projects."
- "I enjoy helping team members."
- "I cooperate with other students."

Students mark how often they do the action in each statement with the following choices: "Never," "Rarely," "Sometimes," "Often," "Usually," and "Always."

Use if teachers spend too much time evaluating students.

Teacher-Report Scale (Advocacy/Guiding Example)

"When helping other students, this student […]"

- "Provides little useful help."
- "Notes how the others are doing, and gives accurate feedback, but may not change helping strategies if other are not doing well."
- "Changes feedback according to how other are doing and feeling, and also revises his/her helping strategies with this."

Teachers mark which description best resembles a student's behavior.

Use if students spend too much time taking assessments.

Situational Judgement Task (Negotiation Example)

"You are the president of your school's drama club. You are starting to plan the big spring musical, and you are meeting with the other members of the club to decide who will take on the various jobs (building sets, painting, getting costumes, serving as stage manager, etc.) required for the production."

Students mark the effectiveness of potential responses to this situation on a 5-point Likert scale ranging from "Very Ineffective" to "Very Effective."

Use if teachers spend too much time evaluating students.

Use to assess student reactions to specific situations, rather than student abstract actions.

Since administrators use the above teamwork assessments for high school students, administrators who wish to measure elementary school students' teamwork skills can use the Children's Self-Efficacy for Peer Interaction Scale. Wheeler and Ladd (1982)

18) Wang et al., "Assessing Teamwork and Collaboration in High School Students: A Multimethod Approach."
19) Wang et al.

developed this scale to measure third through fifth graders' ability to use verbal skills to persuade peers in team situations.[20] This student self-assessment measures communication skills in the context of team or collaborative settings. Students answer 22 questions on a four-point Likert scale. For example, a student fills in "HARD!," "Hard," "Easy," or "EASY!" to the statement, "You are working on a project. Asking another kid to help is _____ for you." While this internally valid assessment measures both teamwork and communication skills, administrators need not analyze the communication portion of the assessment.

Overview of Profiled Teamwork and Collaboration Assessments[21]

Assessment	Grade-Level	Internal Consistency	Number of Items/Time	Format	Availability
Children's Self-Efficacy for Peer Interaction Scale	Grades 3-5	α=0.85	22 questions (10-15 minutes)	4-point Likert scale	**Davis (2015); pages 45-46.**
Teamwork Self-Report Scale	Grades 9-12	Researchers calculated α's for each scale factor: • Cooperation α=0.88 • Advocacy/ Guiding α=0.80 • Negotiation α=0.78	57 questions (10-20 minutes)	6-point Likert scale	**Zhuang et al. (2008); pages 39-42.**
Teamwork Situational Judgment Task	Grades 9-12	α=0.71	8 scenarios (10-20 minutes)	5-point Likert scale	**Zhuang et al. (2008); pages 43-47.**
Teamwork Teacher-Report Scale	Grades 9-12	α=0.98	24 questions (10-20 minutes)	5-point Likert scale	**Zhuang et al. (2008); pages 48-50.**

20) Valerie A. Wheeler and Gary W. Ladd, "Assessment of Children's Self-Efficacy for Social Interactions with Peers," *Developmental Psychology* 18, no. 6 (1982): 796, https://psycnet.apa.org/record/1983-02483-001.
21) Wang et al., "Assessing Teamwork and Collaboration in High School Students: A Multimethod Approach"; Xiaohua Zhuang et al., "Development and Validity Evidence Supporting a Teamwork and Collaboration Assessment for High School Students," *ETS Research Report Series* 2008, no. 2 (2008): i–51, https://doi.org/10.1002/j.2333-8504.2008.tb02136.x; Wheeler and Ladd, "Assessment of Children's Self-Efficacy for Social Interactions with Peers"; Shuan Davis, "Building Self-Efficacy in Peer Relations: Evaluation of a School-Based Intervention" (Newberg, Oregon, George Fox University, 2015), https://digitalcommons.georgefox.edu/cgi/viewcontent.cgi?referer=https://www.google.com/&httpsredir=1&article=1198&context=psyd.

5) Communication

Approach

Prioritize Communication Self-Assessments to Inform Students About Assessment Criteria and Standardize Results

> "Communication performance is defined as a student's ability to execute an interchange of thoughts, opinions, or information by writing, speaking, or professional physical appearance."
>
> *Autman et al. (2016)*

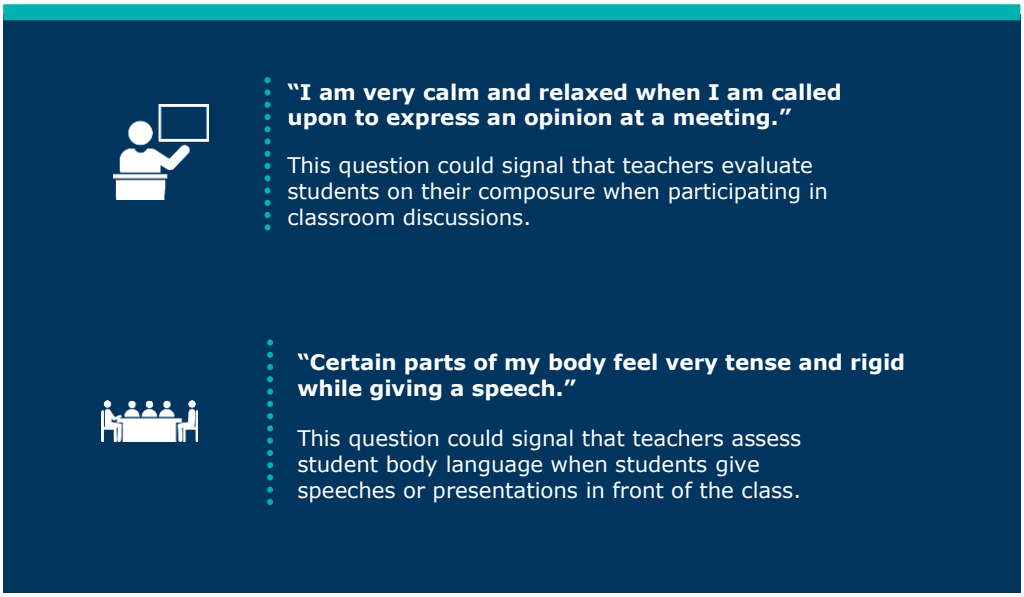
Autman et al. (2016) recommend employing student self-assessments to measure student communication skills. Autman et al. (2016) also recommend student self-assessments cover three components of communication: verbal communication, non-verbal communication (e.g., sign language, facial expressions), and writing.[22] Importantly, teachers and administrators should not assign students' grades based on their self-assessment responses alone. By making student self-assessment responses evaluative, administrators increase the risk that students will answer untruthfully and inflate their own performance.

Educators at the secondary and college level previously assessed students on these categories through written assignments and oral exams. Autman et al. (2016) advocate for the modern approach of testing students' communication skills via self-assessments. The authors argue that self-assessments can inform students about important components of effective communication, just as an essay rubric helps students to understand important components of a strong essay. Answering questions that outline desirable communication skills helps students understand their teacher's criteria for effective communication. With that information, students may take it upon themselves to work on their communication skills independently.[23] Though rubrics for performance tasks (e.g., oral presentations graded by teachers) could also inform students about criteria for effective communication, these performance tasks are often far more time intensive than self-assessment questionnaires.

The below graphic **(page 15)** highlights questions from McCroskey et al.'s (1985) Person Report of Communication Apprehension (PRCA) metric that can help students.[24] The metric asks students to answer response to these statements on a five-point Likert scale ranging from "Strongly Agree" to "Strongly Disagree." Administrators who wish to assess student communication skills can employ self-assessments to communicate assessment criteria to students.[25]

22) Hamlet Autman et al., "Measuring High School Students' Communication Readiness: Does Communication Apprehension, Writing Ability, and Speaking Ability Correlate with Students' Perceptions of Professional Appearance?," *The Journal of Research in Business Education* 57, no. 2 (2016): 45, https://search.proquest.com/openview/4d53488d1fec200f40f42f9783fec668/1?pq-origsite=gscholar&cbl=34490.
23) Autman et al., "Measuring High School Students' Communication Readiness: Does Communication Apprehension, Writing Ability, and Speaking Ability Correlate with Students' Perceptions of Professional Appreance?"
24) James C. McCroskey et al., "The Content Validity of the PRCA-24 as a Measure of Communication Apprehension across Communication Contexts," *Communication Quarterly* 33, no. 3 (1985): 165–73, http://www.jamescmccroskey.com/publications/127.pdf.
25) Autman et al., "Measuring High School Students' Communication Readiness: Does Communication Apprehension, Writing Ability, and Speaking Ability Correlate with Students' Perceptions of Professional Appearance?"

Examples of Rubric Questions from the PRCA[26]



Metrics

Assess Both Verbal and Written Communication

Administrators who seek to assess students' communication skills with a self-assessment should consider deploying two distinct communication assessments, one for verbal communication and one for written communication. In their study on high school students' communication readiness, Autman et al. (2016) administered two assessments: the Personal Report of Communication Apprehension (PRCA) by McCroskey et al. (1985) and the Writing Apprehension Test (WAT) by Daly and Miller (1975).[27] Both metrics employ Likert scales to ask students questions about the extent to which they experience communication apprehension (i.e., student fears, concerns, and potential inhibitions about speaking publicly or writing).

While these assessments specifically measure communication apprehension, students with stronger communication skills are less likely to shy away from communicating either verbally or through writing. Thus, administrators can use time-efficient communication apprehension questionnaire results as a proxy measure of communication comfort and skill, rather than rely on time-intensive performance assessments (e.g., teacher grades on student oral presentations). Administrators can reliably use these assessments as both are internally consistent metrics with alpha coefficients greater than 0.80.[28]

26) McCroskey et al., "The Content Validity of the PRCA-24 as a Measure of Communication Apprehension across Communication Contexts," 166.
27) Autman et al., "Measuring High School Students' Communication Readiness: Does Communication Apprehension, Writing Ability, and Speaking Ability Correlate with Students' Perceptions of Professional Appearance?"; James C. McCroskey et al., "The Content Validity of the PRCA-24 as a Measure of Communication Apprehension across Communication Contexts," *Communication Quarterly* 33, no. 3 (1985): 165–73, http://www.jamescmccroskey.com/publications/127.pdf; John Daly and Michael Miller, "The Empirical Development of an Instrument to Measure Writing Apprehension," *Research in the Teaching of English* 9 (January 1, 1975): 242–49, https://pdfs.semanticscholar.org/5482/198f7834414c8ae8d2363b2950c67bad452a.pdf?_ga=2.59169965.1016659163.1582318751-1206576006.1579630680.
28) [28] Daly and Miller, "The Empirical Development of an Instrument to Measure Writing Apprehension"; McCroskey et al., "The Content Validity of the PRCA-24 as a Measure of Communication Apprehension across Communication Contexts."

Example Questions from PRCA and the WAT[29]

PRCA

"I dislike participating in group discussions."

"I am very relaxed when answering questions at a meeting."

"While giving a speech I get so nervous, I forget facts I really know."

WAT

"Taking a composition course is a very frightening experience."

"I feel confident in my ability to clearly express my ideas in writing."

"When I hand in a composition, I know I'm going to do poorly."

Isolate Communication Skills from General Soft Skills Metrics

Administrators who prefer to assess students with fewer assessments may wish to assign assessments that measure communication alongside other soft skills. For example, both the Children's Self-Efficacy for Peer Interaction Scale (mentioned above) and the Early Development Instrument (EDI) measure multiple soft skills of younger students.

- The Children's Self-Efficacy for Peer Interaction Scale measures students' ability to persuade peers in team situations using their verbal skills (i.e., the assessment measures both teamwork and communication).[30] The student assessment asks students 22 questions, to which students respond on a four-point Likert scale.
- The EDI measures five components of early childhood development: physical health and well-being, social competence, emotional maturity, language and cognitive development, and communication skills and general knowledge.[31] The metric asks teachers to rate students' ability in response to different situations via yes and no answers and a three-point Likert scale. Though administrators should prioritize self-assessments to measure student communication skills, administrators who wish to assess K-2 students can use the EDI. Young students may be even more likely to inaccurately answer self-assessments than older students. Thus, administrators should rely on teacher assessments of students' communication skills for K-2 students.

The EDI metric does not group the questions by these five categories in the assessment itself. Administrators can consult the **EDI website** to group answers into these five categories. The EDI website also provides resources to help administrators use and interpret results.

Administrators can isolate the verbal persuasion questions from the Children's Self-Efficacy for Peer Interaction Scale. Or, administrators can isolate the language and cognitive development questions and communication skills and general knowledge questions from the EDI. After isolating any of these variables, administrators can construct a single metric of student communication skills. Administrators may save more time by isolating one or more skills from more robust soft skills assessments than by administering separate assessments for each soft skill they wish to measure.

29) McCroskey et al., "The Content Validity of the PRCA-24 as a Measure of Communication Apprehension across Communication Contexts," 166; Daly and Miller, "The Empirical Development of an Instrument to Measure Writing Apprehension," 246.
30) Wheeler and Ladd, "Assessment of Children's Self-Efficacy for Social Interactions with Peers."
31) Magdalena Janus and David R. Offord, "Development and Psychometric Properties of the Early Development Instrument (EDI): A Measure of Children's School Readiness," *Canadian Journal of Behavioural Science/Revue Canadienne Des Sciences Du Comportement* 39, no. 1 (2007): 1, https://www.researchgate.net/publication/232455839_Development_and_Psychometric_Properties_of_the_Early_Development_Instrument_EDI_A_Measure_of_Children's_School_Readiness.

Overview of Profiled Communications Assessments[32]

Assessment	Grade-Level	Internal Consistency	Number of Items (Total Time)	Format	Availability
Children's Self-Efficacy for Peer Interaction Scale	Grades 3-5	α=0.85	22 questions (10-15 minutes)	4-point Likert scale	**Davis (2015); pages 45-46.**
Early Development Instrument (EDI)	Pre-K to Grade 2	Researchers calculated α's for all five domains of the instrument. Below are the two relevant domains. • Language and Cognitive Development α=0.93 • Communication Skills and General Knowledge α=0.95	103 questions (45-60 minutes)	3-point Likert scale and Yes/No questions	**Offord Centre for Child Studies; pages four to five.**
Personal Report of Communication Apprehension (PRCA)	Tested with college students, but should transfer to high school students (Grades 9-12).	α=0.85	24 questions (10-15 minutes)	7-point Likert scale	**McCroskey et al. (1985); page 166.**
Writing Apprehension Test (WAT)	Grades 9-12	α=0.81	20 questions (10-15 minutes)	5-point Likert scale	**Daly and Miller (1975); page 246.**

32) Daly and Miller, "The Empirical Development of an Instrument to Measure Writing Apprehension"; Wheeler and Ladd, "Assessment of Children's Self-Efficacy for Social Interactions with Peers"; McCroskey et al., "The Content Validity of the PRCA-24 as a Measure of Communication Apprehension across Communication Contexts"; Janus and Offord, "Development and Psychometric Properties of the Early Development Instrument (EDI): A Measure of Children's School Readiness"; Davis, "Building Self-Efficacy in Peer Relations: Evaluation of a School-Based Intervention"; Magdalena Janus and Caroline Reid-Westoby, "Monitoring the Development of All Children: The Early Development Instrument," *Early Childhood Matters* 125, no. 1 (2016): 40–45; "Early Development Instrument: A Population-Based Measure for Communities" (Ontario: Offord Centre for Child Studies, 2018), https://edi-offordcentre.s3.amazonaws.com/uploads/2019/01/EDI-ON-ENG-2018.pdf.

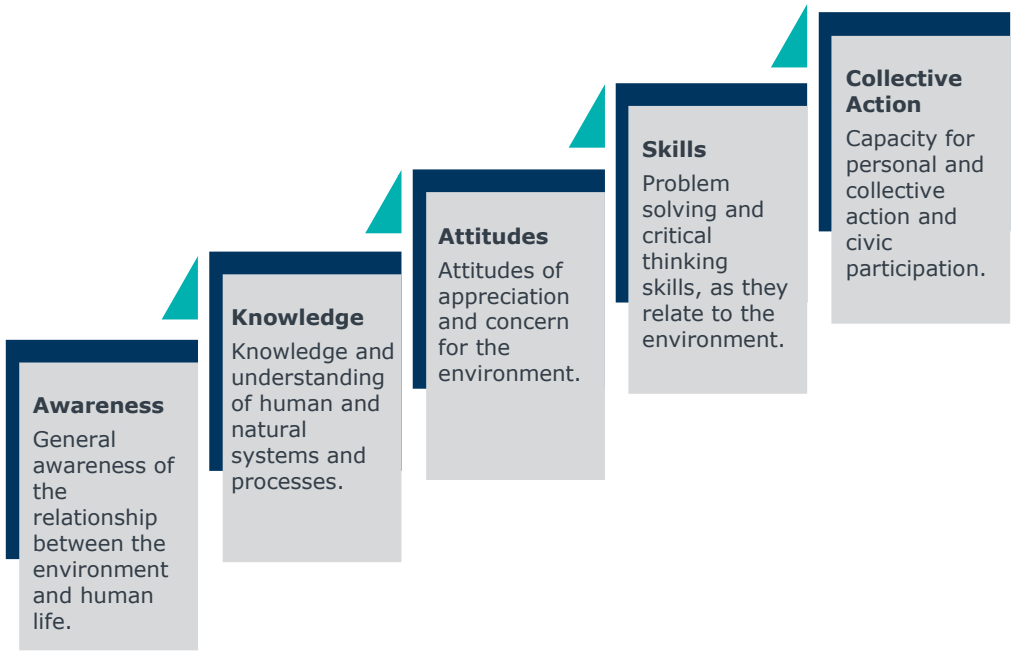
6) Environmental Stewardship

Approach

Measure Students' Progress Toward the Five Distinct Components of Environmental Stewardship

Administrators who wish to measure students' environmental stewardship must first identify which component of environmental stewardship they want to assess. Research on environmental stewardship, or environmental literacy more generally, divides environmental stewardship into five distinct levels.[33] The graphic below **(page 18)** outlines the five rungs of the environmental literacy ladder. Students need to achieve each rung of the ladder to move toward the final rung of environmental stewardship: "capacity for personal and collective actions and civic participation." For example, students must gain awareness that humans impact the environment. Then they can gain knowledge about how humans impact the environment. Administrators should ensure students achieve the subsequent goals leading up to environmental stewardship by measuring student progress toward each of the multiple rungs of the environmental literacy ladder.

Environmental Literacy Ladder from Planet Blue at the University of Michigan[34]



Metrics

Capitalize on Free Questionnaires to Assess Environmental Awareness and Knowledge

Administrators can rely on free and publicly available assessments and questionnaires to measure students' environmental awareness and knowledge—the first two rungs of

33) "Measuring Environmental Literacy," Text, Planet Blue, October 27, 2016, http://sustainability.umich.edu/environ211/measuring-environmental-literacy.
34) "Measuring Environmental Literacy."

the environmental literacy ladder. The Assessment of Sustainability Knowledge, developed by researchers at The Ohio State University and the University of Maryland, measures three major components of sustainability (i.e., environmental) knowledge: the environment, society, and economics.[35] While researchers designed this 16-question multiple choice knowledge assessment for college undergraduates, administrators can consider assessing high school upperclassmen with the same instrument. The below graphic **(page 19)** highlights one example question—with the correct answer bolded—from each of the components of sustainability/environmental knowledge.

Sample Questions from the Assessment of Sustainability Knowledge[36]

1 Environmental

"What is the most common cause of pollution of streams and rivers?"

a) Dumping of garbage by cities
b) Surface water running off yards, city streets, paved lots, and farm fields
c) Litter near streams and rivers
d) Waste dumped by factories
e) Don't know

2 Social

"Which of the following regions has the highest rate of growth?"

a) North America
b) Europe
c) China
d) Africa
e) Don't know

3 Economic

"Many economists argue that electricity prices in the USA are too low because […]"

a) They do not reflect the costs of pollution from generating the electricity
b) Too many suppliers go out of business
c) Electric companies have a monopoly in their service area
d) Consumers spend only a small part of their income on energy
e) Don't know

Administrators can also adopt or model the Missouri Environmental Education Association's (MEEA) Environmental Literacy Questions to assess all K-12 students on specific environmental content knowledge. MEEA developed content knowledge question for all student levels (i.e., K-2, 3-5, 6-8, and 9-12) on ten different environmental topics (e.g., air pollution, climate change, waste). MEEA suggests deploying the assessments before and after lectures or class activities intended to teach students about the environment.[37] Administrators can pick which knowledge assessments best align with their school curriculum. In other words, administrators

35) Adam Zwickle et al., "Assessing Sustainability Knowledge of a Student Population," *International Journal of Sustainability in Higher Education* 15 (August 26, 2014): 375–89, https://doi.org/10.1108/IJSHE-01-2013-0008.
36) Zwickle et al.
37) "Environmental Literacy Questions," Missouri Environmental Education Association, accessed February 26, 2020, https://www.meea.org/questions.html.

should assess students on their knowledge of biodiversity and habitat loss after they learn about it in class.

Measure Students' Environmental Attitudes and Actions with Age-Appropriate Surveys and Questionnaires

Administrators can leverage the Canadian Parks and Wilderness Society (CPAWS) Student Questionnaire to gauge younger students' attitudes towards the environment and their behaviors. Though CPAWS does not specify an age range for the assessment, the questions appear suitable for younger students. Specifically, the "Environmental Attitudes section asks students whether they agree or disagree with certain statements involving the environment or specific ecosystems. For example, students can respond with answers ranging from "strongly agree" to "strongly disagree" for the statement, "Preserving wild areas isn't important because we're good at managing wildlife."[38]

The assessment also asks students to indicate specific behaviors and actions they take toward the environment. These action-oriented questions range from whether students work on outdoor projects to improve the environment to if they turn off the faucet while they brush their teeth.[39] While the section appears to measure both environmental attitudes and behaviors—both components of environmental stewardship—the CPAWS report does not perform any analysis on the internal consistency of these metrics. Additionally, our researchers were unable to identify similar, research-backed metrics for younger students. Administrators who wish to assess high school students instead of younger students may wish to turn to research-supported assessments of environmental attitudes instead.

To that end, administrators may consider employing the Environmental Attitude Scale (EAS) to assess high school students' environmental attitudes and behaviors. Though the CPAWS Student Questionnaire and EAS share many of the question topics (e.g. "I do not waste water while I am brushing my teeth"), the EAS asks student behavior questions better suited for older students (e.g., "I can go from door to door to teach people recycling."). Researchers performed statistical reliability tests on four subgroups of the 35-question survey: environmental awareness, attitudes towards recovery, attitudes towards recycling, and environmental consciousness and behavior. Each subcategory, and the assessment overall, yielded alpha coefficients greater than 0.70.[41]

Internal Consistency of the Environmental Attitude Scale Subcomponents[40]

The entire instrument α=0.83

- Environmental Awareness α=0.84
- Attitudes Towards Recovery α=0.78
- Attitudes Towards Recycling α=0.70
- Environmental Consciousness and Behavior α=0.70

Employ Efficient Environmental Stewardship Metrics to Limit Student Assessment Times

Administrators may consider deploying unobtrusive metrics to mitigate the drawbacks of formal assessments (e.g., potentially inaccurate student answers and time taken

38) Gareth Thomson and Jenn Hoffman, "Measuring the Success of Environmental Education Programs" (Ottawa: Canadian Parks and Wilderness Society and Sierra Club of Canada, 2003), 59–60, http://macaw.pbworks.com/f/measuring_ee_outcomes.pdf.
39) Thomson and Hoffman, 60.
40) Ilker Ugulu, Mehmet Sahin, and Suleyman Baslar, "High School Students' Environmental Attitude: Scale Development and Validation," *International Journal of Educational Sciences* 5 (October 1, 2013): 421, https://doi.org/10.1080/09751122.2013.11890103.
41) Ugulu, Sahin, and Baslar, 421.

away from student instruction). In the United Nations Education, Scientific and Cultural Organization report Evaluating Environmental Education in Schools, the author suggests that administrators can collect data from existing, unobtrusive metrics or teacher engineered situations. These techniques allow administrators to measure student environmental stewardship without students knowing that administrators are evaluating them.[42] Administrators can use these techniques to measure environmental stewardship for all students across the entire school.

The graphic below **(page 21)** outlines the report's suggested metrics and teacher-engineered situations. These unobtrusive metrics can help administrators measure the top rung of the environmental literacy ladder. That said, teacher-engineered situations require more time and resources than relying on existing metrics. Administrators must weigh the benefits of each type of metric against the resources it requires.

Unobtrusive Metrics of Students' Environmental Stewardship in Environmental Education Programs[43]

Sample Metrics

- **Attendance rates** of courses covering environmental topics
- **Extra credit assignments** completed in courses related to the environment
- The **number of books and other media (e.g., audio, videos)**—related to the environment—that students check out from the library
- **Participation rates** in extra-curricular activities related to environmental stewardship

Teacher-Engineered Situations

- **Number of students who volunteer** to answer questionnaires for fake surveys related to environmental stewardship
- **Student response rates** to posters or bulletins for volunteer activities related to the environment
- **Student comments** heard by teachers in response to an environmental problem at school (e.g., litter on school grounds) possibly tracked through coded student responses

42) Dean Bennet, "Evaluating Environmental Education in Schools: A Practical Guide for Teachers," Environmental Education Series (United Nations Educational, Scientific and Cultural Organization, 1984), 43–44, https://unesdoc.unesco.org/ark:/48223/pf0000066120.
43) Bennet, 43–44.

Overview of Profiled Environmental Stewardship Assessments[44]

Assessment	Grade-Level	Internal Consistency	Number of Items (Total Time)	Format	Availability
Assessment of Sustainability Knowledge	College students, but also high school seniors	N/A (knowledge-based)	16 questions (10-15 minutes)	Multiple choice	**Zwickle et al. (2013)**
CPAWS Student Questionnaire	Grades 3-6	N/A	26 questions (15-20 minutes)	Multiple choice and a 5-point Likert scale	**Thomson and Hoffman (2003)**; **pages 58-60**.
Environment Attitude Scale (EAS)	Grades 9-12	For the whole instrument α=0.83	35 statements (10-15 minutes)	4-point Likert scale	**Ugulu et al. (2013)**; **page 420.**
Environmental Literacy Questions	Grade K-2, 3-5, 6-8, and 9-12	N/A (knowledge-based)	25-45 questions on ten different topics (15-20 minutes per topic)	Multiple choice	**Missouri Environmental Education Association**
Unobtrusive Metrics	Grades K-12	N/A (not an instrument)	N/A	Varies	**Bennett (1984)**; **pages 43-44.**

44) Adam Zwickle et al., "Assessment of Sustainabliity Knowledge" (Environmental & Social Sustainability Lab - School of Environment and Natural Resources & the Office of Sustainability at The Ohio State University and the Office of Sustainability at the University of Maryland, July 2013), https://ess.osu.edu/sites/essl/files/imce/Phase%20II%20Questions%20no%20bold%20answers.pdf; Zwickle et al., "Assessing Sustainability Knowledge of a Student Population"; Ugulu, Sahin, and Baslar, "High School Students' Environmental Attitude: Scale Development and Validation"; Thomson and Hoffman, "Measuring the Success of Environmental Education Programs"; Bennet, "Evaluating Environmental Education in Schools: A Practical Guide for Teachers."

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