

National Assessment Governing Board

Committee on Standards, Design and Methodology

March 4, 2016
10:15 am – 12:45 pm

AGENDA

10:15 – 11:15 am	Joint Session with Reporting and Dissemination Committee: Collaboration on Infographics and Communicating NAEP Findings <i>Rebecca Gagnon, R&D Committee Chair</i> <i>Andrew Ho, COSDAM Chair</i>	Attachment A
11:15 – 11:20 am	Break	
11:20 am – 12:05 pm	CLOSED SESSION: Update on Maintaining Trends with Transition to Digital-Based Assessments (DBA) <i>Andreas Oranje, Educational Testing Service</i>	Attachment B
12:05 – 12:25 pm	CLOSED SESSION: Plans for 2017 Writing Grade 4 Achievement Levels Setting Procurement <i>Sharyn Rosenberg, Assistant Director for Psychometrics</i>	Attachment C
12:25 – 12:40 pm	Update on NAEP Linking Studies <i>Andrew Ho</i> <i>Sharyn Rosenberg</i>	Attachment D
12:40 – 12:45 pm	Information Items <ul style="list-style-type: none">• Update on Evaluation of NAEP Achievement Levels• Student Engagement in NAEP: Critical Review and Synthesis of Research	Attachment E Attachment F

**Joint Session of the
Reporting and Dissemination Committee & the Committee on Standards,
Design and Methodology:
Collaboration on Infographics and Communicating NAEP Findings**

Initial drafts of the Governing Board’s Strategic Plan and the Communications Plan adopted by the Governing Board in 2014 emphasize the need for compelling and comprehensible ways to report NAEP findings. NAEP reporting should appeal to a diverse range of stakeholders in education, from the general public and parents through administrators and policymakers at state and local levels. An essential element of the Board’s Communications Plan is connecting with these target audiences through:

“sharing relevant messages, content, stories... to identify and highlight hidden gems of NAEP data, connecting the dots between data and practice and leveraging resources to reach specific audiences to deliver important messages in a meaningful and memorable way.” (*Communications Plan*, p.3)

At the same time, any dissemination of NAEP findings—e.g., infographics, panel discussions, briefs—must be technically sound and help these audiences accurately interpret the meaning, impact, and implications of the findings. The Governing Board’s Reporting and Dissemination Committee (R&D) is responsible for pursuing this effort to expand the content, frequency, and presentation of disseminating NAEP findings while providing these audiences with enough information to understand the magnitude and meaning of the results accurately.

To this end, the R&D Committee has invited members of the Committee on Standards, Design and Methodology (COSDAM) to engage in a conversation about implementing the Governing Board’s Communications Plan. The more inward-focused expertise of COSDAM in NAEP design and methodology neatly complements the more outward-focused expertise of R&D in disseminating NAEP findings. The joint meeting’s discussion should center on COSDAM’s collective thoughts on how to consider the statistical and technical implications of extending NAEP’s message.

Examples of infographics to extend the message are included with your Board materials, as is the Board’s Communications Plan. To guide the discussion, please review these materials and consider the following questions:

1. What questions do the diverse audiences for NAEP have of the Governing Board’s efforts to disseminate NAEP results?
 - a. What information would help anticipate and address these questions?

- b. How can the Governing Board strike the appropriate balance between making reporting accessible and helping audiences interpret findings accurately?
- 2. What types of data presentations best extend the reach of NAEP after the initial release of findings?
- 3. How can the Governing Board best disseminate and promote materials featuring the findings of contextual variables without unintentionally implying “cause and effect”?

NATIONAL ASSESSMENT GOVERNING BOARD 2014 STRATEGIC COMMUNICATIONS PLAN

Approved August 2, 2014

In 2014 and beyond, the National Assessment Governing Board seeks to focus its communication efforts strategically and cost effectively to “Make Data Matter” for various target audiences. The Board is well-positioned to increase the impact of its outreach, but it must prioritize its audiences and identify its objectives for each, while integrating innovative strategies to elevate the Board’s work—and NAEP—as a thought leader in education.

Reingold proposes three goals the Board can pursue to amplify its outreach efforts.

- I. Make a Connection With Target Audiences
- II. Engage Audiences Between Report Card Releases
- III. Maximize Impact Through Innovation

Reingold’s assumption in developing strategic priorities for the Board is that reporting and dissemination activities must support a vision to **make an impact in education through engagement with NAEP that will enable the use, discussion, and sharing of NAEP data and information**. A time-phased action plan, including specific outreach tactics and metrics, will be developed with Governing Board staff on the Board’s approval of this strategic communications plan.

The members of the Reporting and Dissemination Committee have identified three key audiences it believes the Board should focus on—parents; teachers and administrators; and policymakers—as each of these audiences is in a position to make an impact through NAEP data. Working with staff, we will identify the Board’s goals and expectations of each audience and the key messages needed to engage each one effectively.

Potential outcomes of the audience-focused outreach are listed below:

Parents

- Understand the value of NAEP and its implication for parents.
- Ask informed questions about their child’s education and the school system.
- Use NAEP to consider out-of-school factors that might affect their child’s education.
- Share NAEP information and messages with their parent peers.

Teachers and Administrators

- Understand the value of NAEP and its implication for teachers and administrators.
- Use NAEP to influence change within their classroom or school system.
- Educate parents about NAEP data and resources.
- Share and distribute NAEP information to their peers.

Policymakers

- Understand the value of NAEP and its implication for education policy.
- Use and cite NAEP data in policy decisions, public statements, and white papers.
- Distribute NAEP information and messages to constituents and peers to help advocate for change.

It is important to remember that messages and calls to action are intended to move the Board's priority audiences along an engagement continuum, from awareness and education to trial, buy-in, and, ultimately, action. But creating the right messages is only the beginning. It is critical to know which information to deliver first, which should follow, and who are the most credible messengers. We will lay out a cohesive, practical, comprehensive roadmap for reaching the Board's target audiences that identifies how to take advantage of existing opportunities, what new strategies to develop, and optimal methods of dissemination. The action plan will include a variety of opportunities to connect with each audience to maximize the reach and frequency of each message. The proposed strategies involve cultivating and leveraging partnerships that will include stakeholders or champions. There will also be collaboration with the National Center for Education Statistics (NCES) to ensure efforts are not duplicated, with Board and NCES staff coordinating on roles, responsibilities, and resources on various strategies as needed.

To illustrate the strategies identified above, below we discuss what the execution of each one could involve for the Board's three priority audiences.

I. Make a Connection With Target Audiences

The goal is personal and powerful: "Communicate the Value of NAEP." This means going beyond the distribution of NAEP data to highlighting, developing, and sharing relevant messages, content, stories, and calls to action for key audiences. Communicating the "So what?" and "Why should we care?" can help the Board move beyond the scores and headlines to clarify the value of NAEP and its important role as an indicator of student achievement.

- **Develop key messages and calls to action for priority audiences.** The Governing Board's audience is widely diverse—in their knowledge of and experience with NAEP, in their intended uses and consumption of data and information, and in their communications networks, favored channels, and approaches. With these differences in mind, it is imperative that the Governing Board tailor messages for each of its audiences to inspire deeper engagement with NAEP data. Instead of a one-size-fits-all approach, we will define and continually test and adjust the messages that are the most relevant to each audience.

Example of the strategy in action for parents: Include the tailored messages and calls to action on the website's "Information For" parent pages. The parent landing page could have calls to action including "Learn about NAEP," "Download NAEP resources," or "Test yourself on NAEP questions." The page could also have a section devoted to the Board's assessment literacy efforts (including resources, information and questions to ask) once outreach strategies from the work group are finalized.

Example of the strategy in action for teachers and administrators: The American Federation of Teachers and National Education Association could include a NAEP toolkit with messages for teachers on its website in a resources section.

Example of the strategy in action for policymakers: Minneapolis Board of Education and Governing Board member Rebecca Gagnon could use and reference data from *Science in Action: Hands-On and Interactive Computer Tasks From the 2009 Science Assessment* in a discussion with the Minnesota Department of Education and the Minnesota Education Technology Task Force about the importance of science computer labs.

Impact metrics: The number of downloads of materials such as a PowerPoint or frequently asked questions PDF; number of clicks on links for calls to action (e.g., “Test yourself on NAEP questions”); number of champions—that is, advocates—who commit to using or distributing the NAEP messaging and toolkit.

- **Expand communications beyond reporting on the scores.** We need to get beyond the typical report presentations of the data and find meaningful ways to elevate the data (and their implications) through materials, messaging, and outreach activities. We will identify and highlight hidden gems of NAEP data, connecting the dots between data and practice and leveraging resources to reach specific audiences to deliver important messages in a meaningful and memorable way. The Governin Board must be a storyteller that educates its audiences about the relevancy of NAEP data and resources in a way that resonates with its audiences’ interests and needs in an actionable manner.

Example of the strategy in action for parents: Develop a parent leader discussion guide to assist parent leaders in using NAEP and other assessment data in their conversations with school administrators about improving student achievement for all children.

Example of the strategy in action for teachers and administrators: Develop an interactive Prezi presentation (a visually animated storytelling tool for presenting ideas and messages) on NAEP achievement gap data from the recent *2013 Mathematics and Reading, Grade 12* report card for New Leaders, a national nonprofit organization that develops transformational school leaders and designs effective leadership policies and practices for school systems across the country.

Example of the strategy in action for policymakers: Governing Board member Anitere Flores could host a Florida Senate session on parent involvement in education to highlight NAEP contextual variables data in reading from the *2013 Mathematics and Reading, Grade 12* report card. For example, when asked whether students discussed what they read, students who reported discussing their reading every day or almost every day had higher reading scores.

Impact metrics: The number of guides distributed at stakeholder conferences or downloaded from the website; number of groups posting the guide on their websites; number of Prezi and data downloads; parent-submitted testimonials and feedback on using the guide to speak with school and district leaders.

- **Tell the NAEP story through user testimonials.** NAEP data become more impactful when stakeholders learn how others use the data to fulfill their missions and advance their educational goals. Working through key groups, we will collect and disseminate real-life testimonials from the priority audiences to become an authentic author of the NAEP story.

Example of the strategy in action for parents: Collaborate with National PTA to solicit testimonials from parents about how they use NAEP and other assessment data, and then promote the testimonials through the Board's and PTA's online networks. These testimonials and other NAEP information could also be featured on the websites of other national education groups, encouraging parents to learn about different assessments their children might take and how the data can be used.

Example of the strategy in action for teachers and administrators: Coordinate with elementary school principal and Board member Doris Hicks and future Board member chosen for the secondary school principal slot to collaborate with the National Association of Elementary School Principals and the National Association of Secondary School Principals to solicit testimonials from principals and teachers within their districts about how they use NAEP and the importance of at-home and out-of-school activities that enhance learning, then promote testimonials through the school communication channels.

Example of the strategy in action for policymakers: Collaborate with the National Association of State Boards of Education to collect testimonials from state board members on how data, including NAEP data, are used to inform policy-level decisions and improvements.

Impact metrics: The number of NAEP user testimonials received; number of testimonial views online; number of social media shares and engagement; quality of the engagements and comments about parents using data.

- **Potential action taken by key audiences under this goal:** Using NAEP materials and resources on organization websites to inform questions of school and education leaders about school curriculum and district progress; downloading NAEP sample questions to test student knowledge or supplement classroom lessons;

II. Engage Audiences Between Report Card Releases

The goal is ongoing and impactful: "Continual Engagement." This means building tangible connections—outside of report card release events—between NAEP and its stakeholders, and equipping them with the insight, information, and tools to make a difference in educational quality and student achievement. This important strategy cannot be executed by staff alone, and will require the contributions of Board members and the partnership of stakeholder groups and other NAEP champions, including former Board members.

- **Expand the report card release life cycle.** There is great opportunity for the Governing Board to enliven data and engage target audiences by taking a comprehensive, reimagined view of releasing and reporting on NAEP results that goes beyond the one-day release event. The entire life cycle of an assessment—from developing the framework to fielding assessments to disseminating results—offers content and commentary that, if shared more strategically, will powerfully support the NAEP brand and use of NAEP by target audiences. The Board can both enhance the report card releases and extend the life cycle to make meaningful connections with target audiences by developing pre- and post-release content, and recording and sharing video or audio which tease out and illuminate NAEP data.

Example of the strategy in action for parents: For each report card release develop a highlight reel with panelist quotes, select data points, and facts on reading, mathematics, and science contextual variables to send to parent stakeholder groups to distribute to their networks and on the Web.

Example of the strategy in action for teachers and administrators: Governing Board member Terry Mazany could host a meeting with the executive director of the Chicago Principals & Administrators Association to discuss the value of NAEP state and TUDA achievement data.

Example of the strategy in action for policymakers: Host a briefing with the California State Board of Education on the performance of fourth-grade students in the *NAEP 2012 Writing Grade 4 Pilot* with a diverse panel to include California fourth-grade teacher and Governing Board member Shannon Garrison, the executive director of the National Writing Project, and authors Carol Bedard and Charles Fuhrken.

Impact metrics: The numbers of video views and shares; number of groups posting the video; quality of comments and conversations under the video; feedback from stakeholder groups about the impact of the video and parent engagement with the content; number of participants at the meeting or briefing.

- **Leverage partnerships with stakeholder organizations and champions.** As a trusted messenger of information to key audiences, the Governing Board needs to mobilize its existing networks, engaging stakeholder groups and champions to share and shape future outreach. Stakeholders and champions are diverse and can be from education associations or news outlets like NBC News. They could also be politicians, celebrities, athletes, or prominent individuals like First Lady Michelle Obama. We will help the Board identify key partnership opportunities for its priority audiences and develop specific recommendations for engagement, to put their distinct capabilities to work in promoting NAEP and extending the Governing Board's reach. For example, we could keep working with the Alliance for Excellent Education to produce and promote post-release webinars, provide data infographics to the National Council of Teachers of Mathematics, and collaborate with the National Council of La Raza in sponsoring Facebook chats in addition to consistently pursuing new opportunities with key stakeholder organizations.

Example of the strategy in action for parents: Collaborate with NBC News' Education Nation and Pearson on their Parent Toolkit (www.parenttoolkit.com) including NAEP materials, graphics, and downloadable resources on the website that position the Governing Board as an authoritative source of information on student assessment data.

Example of the strategy in action for teachers and administrators: Collaborate with Danica McKellar, actress, author, and STEM education advocate, to submit an article to the National Science Teachers Association's NSTA Express newsletter on the importance of STEM education and girls' involvement in STEM, and include data from NAEP's *Technology and Engineering Literacy* assessment.

Example of the strategy in action for policymakers: Arrange for James Geringer and/or Ronnie Musgrove, Board members and former governors, to present at the annual National Governors Association conference on an important policy issue affecting states in which NAEP data and contextual variables are relevant. Additionally, the Board and the governors can collaborate with the Center on Education Policy to include NAEP reading data and contextual variables (such as frequency of discussing what they read or finding reading enjoyable) in their research papers, publications and annual progress report.

Impact metrics: The number of clicks on the NAEP content; number of downloads of NAEP materials; use of presented NAEP data by governors and state policy leaders in media citations, state websites and other materials; volume of referral traffic from the Parent Toolkit site back to the Governing Board's website; Education Nation engagement that identifies stories of the Toolkit in action; number of newsletter opens and clicks; number of research report downloads.

- **Equip, empower, and display thought leadership.** The Governing Board and NCES are well-positioned as thought leaders among researchers and many national policymakers but could expand their influence with other audiences, such as parents, local policymakers, and education practitioners. Governing Board members and staff should be seen by media representatives and stakeholders as valued spokespeople on educational assessment and achievement, including specific topics such as computerized assessments, achievement gap trends, 12th-grade academic preparedness, and the importance of technology, engineering, and literacy. The Board can also continually secure speaking engagements at a variety of events such as the International Reading Association's annual conference or local PTA chapter meetings, or pitch quotes for inclusion in news articles and op-eds on relevant topics.

Example of the strategy in action for parents: Work with Board member and parent Tonya Miles and develop and pitch op-eds that connect NAEP data with important year-round education events, emphasizing the role parents can play in raising student achievement. During Black History Month, pitch a piece to HuffPost Parents that spotlights achievement gap success stories, or pitch a piece about technology and engineering skill-building beyond the classroom to *Sacramento Parent* magazine.

Example of the strategy in action for teachers and administrators: Co-host a webinar discussion on NAEP state achievement trends with the American Federation of School Administrators, with members weighing in on state-level changes and education initiatives that are aimed at increasing achievement.

Example of the strategy in action for policymakers: Submit a proposal to the National School Board Association's annual conference for a Board member and NCES to co-host a breakout session to share and discuss the recent *2013 Mathematics and Reading, Grade 12* report card, academic preparedness data, and recent graduation rate research.

Impact metrics: The numbers of op-ed placements, shares, and comments; quality of user engagements and comments; number of follow-up questions from readers; number of new emails collected (from a "Subscribe to the Governing Board" call to action); number of webinar and conference participants and follow-up requests.

- ***Potential action taken by key audiences under this goal:*** Inspired by op-ed on racial achievement gaps, exploring gaps in their own districts and talking with school leaders about parity of resources; noting performance trends in subjects by state and/or urban district and then using that knowledge to inform state, local, or school district-level decisions regarding academic programs.

III. Maximize Impact Through Innovation

The goal is proactive and cutting-edge: "Lead the Way." This means reaching and making meaningful connections with priority audiences, customizing events, fostering and driving online conversations, and creating tech-savvy materials with compelling content.

- **Customize release event formats.** Report cards are not one-size-fits-all; innovative release event strategies are needed to achieve the specific goals of each release. Each release event strategy should have distinct goals, audiences messages, materials, strategies, and tactics to Make Data Matter. The Governing Board has expanded the report card release event structure from physical events for every release to include webinars and live-streaming during events, a post-release social media Facebook chat, and an online town hall event. We will continue to refine this approach to customizing every release to maximize the immediate release impact and create a sustained conversation that continues to reach and engage key audiences.

Example of the strategy in action for parents: Host a Google Hangout for parents after a NAEP release that can feature panelists from the National Council of La Raza talking about the importance of parent involvement in education, and encourage parent participants to share how they use data to help their students achieve.

Example of the strategy in action for teachers and administrators: Develop a Twitter town hall guide (NAEP data points, question-and-answer content, best-practice tips, and facilitation instructions) for teachers and school administrators to host their own facilitated chats with parents and the school district on state-level NAEP data and areas for application.

Example of the strategy in action for policymakers: Host an in-person round-table discussion with members of the Massachusetts Mayors' Association on the latest state-level NAEP reading and mathematics results and their state-based implications.

Impact metrics: The number of promotions of the online events and shares of the URL; numbers of event participants and total users viewing them or reached; numbers of comments or participants sharing their testimonials; number of follow-up testimonials received for inclusion in materials or on the website.

- **Engage in the online conversation.** It is important to be aware of the conversations on important education issues, but to influence and help shape public understanding and perceptions the Governing Board needs to participate in the conversation with key messages. We will help the Governing Board foster conversations through real-time engagement on social media platforms, develop content such as an article written by a Governing Board member to post on NAEP's upcoming blog coordinated by NCES, and create a strategy to join or host online chat events, sponsor Q&A sessions, or solicit feedback. Champions are key to the success of this effort, providing greater reach and often a more powerful story than the Governing Board can tell alone.

Example of the strategy in action for parents: Hold a webinar with the Governing Board's Education Summit for Parent Leaders attendees and parent leader champions to review the NAEP website workshop tutorial and obtain feedback through a moderated chat on how they have used NAEP data since the event. Compile feedback to create a one-pager and share it with participants.

Example of the strategy in action for teachers and administrators: Collaborate with the National Council of Teachers of Mathematics (NCTM) on an online Q&A chat session based on the NAEP *Mathematics Curriculum Study* data, educate NCTM about the wide variance of content in mathematics courses and books with the same name. Board member and math teacher Dale Nowlin could be a participating panelist.

Example of the strategy in action for policymakers: Reach out to the National Governors Association (NGA) on Twitter and provide NGA with content and data about the *2013 Mathematics and Reading, Grade 12* report card.

Impact metrics: Numbers of campaign participants and user submissions; numbers of engagements ("likes," comments, shares, retweets, views) for the multimedia submissions; quality of comments on the multimedia submissions; growth in the Governing Board social media audience and number of engaged users discussing assessment data.

- **Create multimedia, digital content and materials.** The Governing Board must present messages, graphics, and images that resonate with target audiences. A wealth of materials has been developed by the Governing Board and NCES, and the first step will be to audit and catalog resources that may be repurposed through outreach and promotional activities. For the materials gaps that are identified, it is imperative to develop interactive, multimedia content and materials that deliver key messages to target priority audiences and include a call to action. Examples include infographics that embellish key report card findings to facilitate understanding and encourage engagement with NAEP data among nonexperts; videos, Prezi, and other presentation tools allowing exploration of the relationships between ideas and numbers and visual presentations of NAEP; and an email newsletter with new content and specific calls to action.

Example of the strategy in action for parents: Create a “NAEP for Parents” email newsletter with information on the latest report card data and trends, multimedia content such as video clips or NAEP data user testimonials, and links to other resource or news content and the interactive data maps on the Board’s parent Web pages, to be distributed bimonthly or consistently throughout the year.

Example of the strategy in action for teachers and administrators: Create an infographic with “hidden data” gems from the *NAEP Grade 8 Black Male Students* report and accompanying language to share with the National Alliance of Black School Educators to post on social media.

Example of the strategy in action for policymakers: Work with Board member Terry Holliday to create an interactive presentation at CCSSO’s annual large-scale assessment conference on NAEP computer-based assessments, or work with Board member Tom Luna to distribute the dynamic 12th-grade preparedness video highlighting the new college preparedness data to Chiefs for Change members.

Impact metrics: Email open rate; numbers of email shares, clicks from email to website, and new email subscribers; number of release participants who list the email as their referral source; numbers of email replies or responses with inquiries about NAEP or acquiring NAEP materials and resources; number of video and infographic views and shares.

- ***Potential action taken by key audiences under this goal:*** Using contextual data to influence out-of-school factors that have been shown to correlate with achievement; using curriculum study findings to investigate course rigor and influence change for exposure to challenging subject matter.

By pursuing these three fundamental communication goals and identifying priority strategies and tactics, the Governing Board can more effectively reach its target audiences to Make Data Matter and, ultimately, make an impact.



Understanding Testing in America



EDUCATIONAL TESTS MEASURE MANY DIFFERENT SKILLS AND ARE USED FOR DIFFERENT PURPOSES.



INSTRUCTIONAL GUIDANCE

Teachers can use classroom assessments to continually adjust instruction to help each student learn.

- ✓ Quizzes and tests
- ✓ Written reports and oral queries
- ✓ Student presentations



INDIVIDUAL ACHIEVEMENT

Schools, districts, or states may administer tests to assess student learning or preparedness for the next step in their education.

- ✓ Final course exams
- ✓ State tests
- ✓ High school exit exams



ACCOUNTABILITY

Assessments may evaluate the progress of a particular school, educational program, teacher, or district toward statewide standards.

- ✓ State-mandated standardized tests



NATIONWIDE ACHIEVEMENT

A nationally representative assessment can be given to a sample of students and provide a snapshot of achievement across subjects, demographic groups, and regions by nation, state, and large urban district.

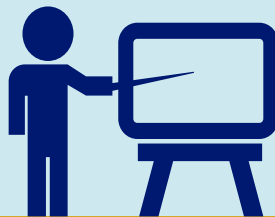
- ✓ The National Assessment of Educational Progress (NAEP)



PLACEMENT AND ADMISSIONS

Assessments can help determine whether a student is prepared for a particular course, course level, or educational program. Advanced Placement (AP) and International Baccalaureate (IB) tests can be used to earn college credit.

- ✓ Placement tests—AP & IB
- ✓ College admission exams—SAT & ACT



WHAT MAKES NAEP UNIQUE:

AN OBJECTIVE, VALUABLE MEASURE OF STUDENT ACHIEVEMENT

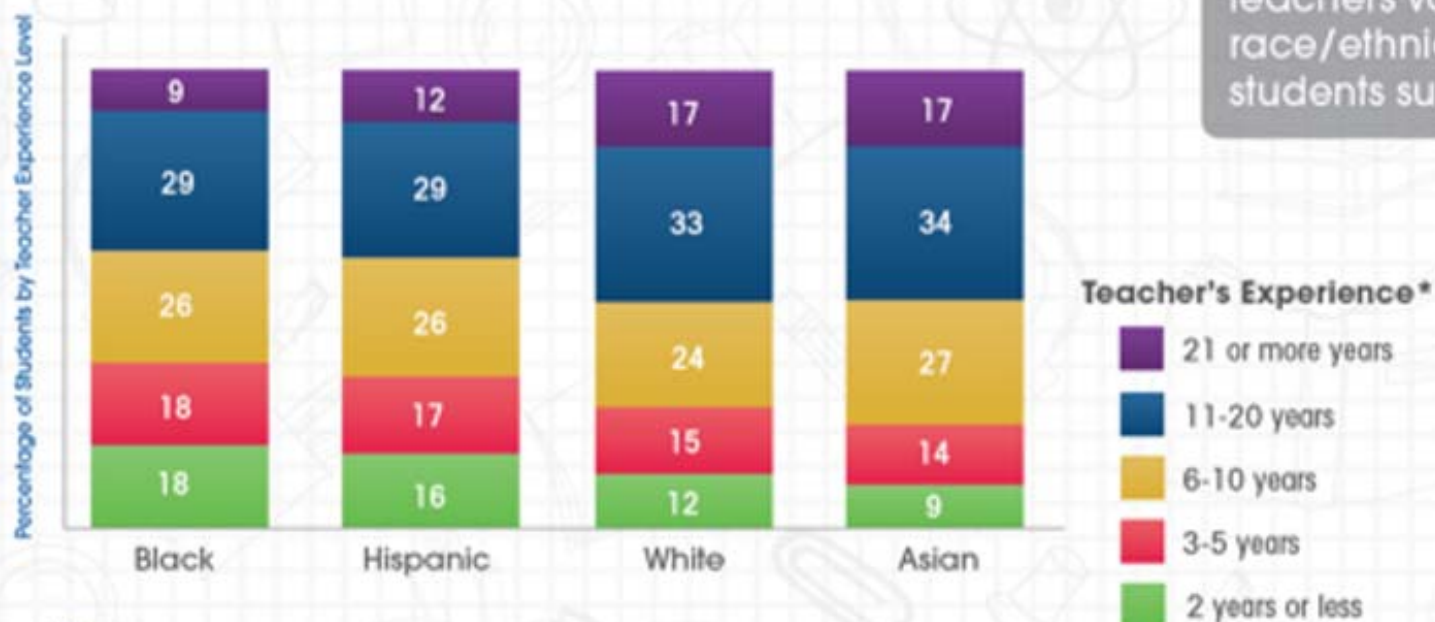
NAEP—The Nation's Report Card—is the country's most respected continuing, independent, and nationally representative measure of student achievement in about a dozen subjects by nation, selected subjects by state, and selected large urban districts. NAEP is a congressionally authorized project of the National Center for Education Statistics (NCES) within the U.S. Department of Education. The National Assessment Governing Board sets policy for NAEP.

- ✓ Gathers and reports nationally representative data on all states and for 21 large urban districts
- ✓ Shows comprehensive trends in student achievement for more than 40 years
- ✓ Provides parents, educators, and policymakers with important information to understand achievement and promote learning
- ✓ Identifies gaps in achievement among different demographic groups of students nationwide

- ✓ Collects information from students, teachers, and schools on factors related to student achievement including student study habits, classroom practices, and school resources.
- ✓ Ensures students randomly selected to participate in NEAP represent the nation's geographical, racial, ethnic, and socioeconomic diversity. Each student only takes a portion of NAEP, reducing the burden on schools and on participants. It does not result in scores for individual students or schools and cannot be used for placement or teacher evaluation purposes.

Student Race/Ethnicity and Teacher Experience Level, Grade 8 Mathematics

From the National Assessment of Educational Progress (NAEP), 2015



Experience level of math teachers varies with race/ethnicity of 8th-grade students surveyed on NAEP.



Source: The Nation's Report Card: 2015 Mathematics and Reading

* Teacher-reported question: "Excluding student teaching, how many years have you taught mathematics in grades 6 through 12, counting this year?" Original responses that were collapsed for this graphic: Less than 1 year, 1-2 years, 3-5 years, 6-10 years, 11-20 years, or 21 or more years.



Update on Maintaining Trends with Transition to Digital-Based Assessments (DBA)

As NAEP transitions from paper to digitally-based assessments, an important question is how this transition affects trend reporting. To address this question NCES has done two things:

- (1) Designed, implemented, and extended bridge studies to investigate the effect of mode changes on score distributions;
- (2) Developed a decision tree to describe the key factors for subsequent analysis and decision making about trend reporting.

(1) Two bridge studies have been planned, one of which is currently being executed. Data collection for the first bridge study was part of the 2015 operational administration and entailed national samples in all three grades for math, reading, and science. In these samples, a tablet-based version of the various NAEP instruments was administered on NAEP-provided tablets and analysis is currently under way. The goal is to compare the results from these digitally-based assessments to the paper-based assessments. The second bridge study currently planned would occur in 2017 in math and reading in 4th and 8th grade and entails small state-level samples participating in the paper-based assessment alongside larger state-level samples participating in the tablet-based assessment. The goal of this second study would be to (a) look at the stability of the mode differences (if any) across years (2015 and 2017) and (b) to estimate mode differences at the state level.

(2) A decision tree was developed as a way to establish *a priori* decision parameters in preparation for the analysis and to reduce hindsight biases. As discussed previously by COSDAM and made explicit in a Governing Board Resolution on trend results recently adopted, the question is not about whether to report trends, but how to report trends. The decision framework has been set up accordingly. At the highest level, there are two chained questions: (a) Do we measure the same construct across modes? and (b) If so, are (construct-irrelevant) mode differences constant across student groups? Answering those questions is complicated and the decision tree attempts to connect sources of evidence to outcomes as they relate to how trend could be reported in accordance with the policy. Key factors that are brought to bear are dimensionality and model-data fit, national student group differences, and state-level differences, among many other less prominent factors.

At the November 2015 COSDAM meeting, we presented the decision tree that we developed to guide our analyses and trend decision-making for the transition from paper to tablet administration. In addition, some initial results from the 2015 reading study were shown, noting that most of the work was still ahead of us in

terms of other subjects, quality control (QC), and various deeper analyses. At the March 2016 COSDAM meeting we will provide an update on the trend results, discuss some of the challenges we faced, and relate the findings to design decisions for 2017 and beyond.

The reading analysis has progressed quite nicely meaning that we will be able to show equated results for all three grades and disaggregated by many student groups. In addition, we have conducted calibrations that explicitly quantify the differences between paper and tablet in terms of scale scores. This was done for investigative purposes to further understand the results across items and student groups and to help us provide appropriate context around equated results.

The mathematics analysis has also progressed significantly, focusing predominantly on the multi-stage testing design of the tablet based administration. We will show percent correct and equated results for grades 4 and 8 and discuss the scaling approach we end up using for these results.

Finally, we have revisited the overall design for 2017. In the third part of this presentation, we will present a more conservative design approach, particularly in mathematics, in 2017. We will lay out the design for 2017, which represents a more consistent approach with (1) the principle of a gradual shift to digitally based assessments and (2) NAEP's tried-and-tested way of conducting extensive research before an operational change is made. In fact, the principle of a gradual shift was the core reason to incorporate a state level paper based assessment in 2017.

Plans for 2017 Writing Grade 4 Achievement Levels Setting Procurement

The 2017 NAEP writing assessment is the first administration of the grade 4 assessment under the current computer-based Writing Framework

(<https://www.nagb.org/publications/frameworks/writing/2011-writing-framework.html>)¹.

Pursuant to the Governing Board's legislative mandate, achievement levels must be set for the grade 4 writing assessment. In accordance with the Board policy on setting performance levels for NAEP, the achievement levels setting process includes achievement levels descriptions (ALDs), cut scores, and exemplar items. In 2012, the Board formally approved the updated achievement levels descriptions for writing at all three grade levels. A procurement is being planned for a contractor to design and implement studies to recommend cut scores and exemplar items.

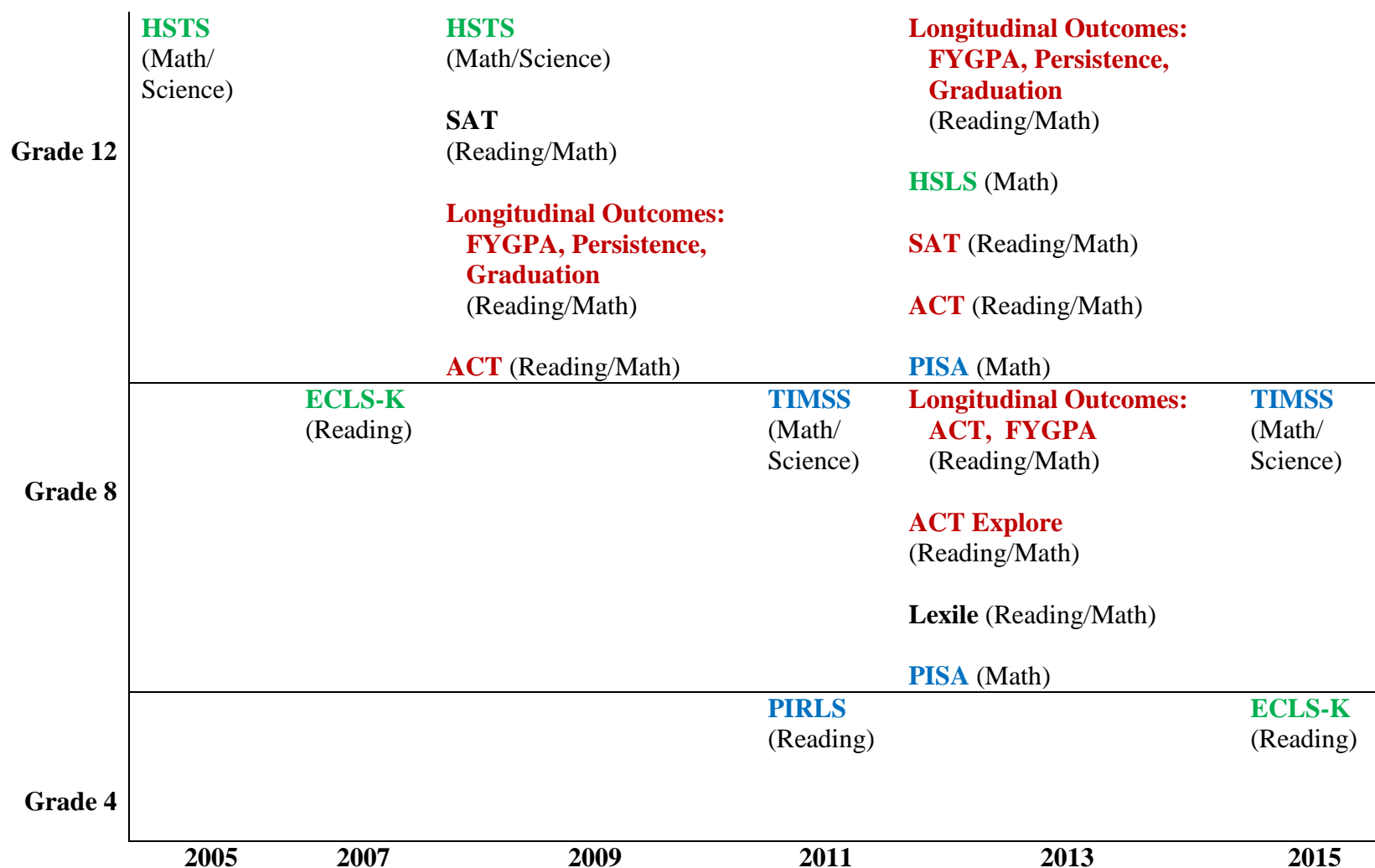
The 2017 grade 4 writing achievement levels setting will include a field trial (to test logistics associated with any software used to conduct the process), a pilot study, and an operational achievement levels setting study. In addition, the design procedures will require the collection of multiple sources of validity evidence. COSDAM will receive briefings and have the opportunity to provide input on the process throughout the life of the project, with Board action on the grade 4 writing achievement levels planned for the May 2018 Governing Board meeting.

On February 4, 2016, a pre-solicitation notice was issued on www.fbo.gov: https://www.fbo.gov/index?s=opportunity&mode=form&id=bc7a4709b2f43033d22b3bcf851d1cb1&tab=core&_cview=0. The Request for Proposals (RFP) will be issued by approximately March 31, 2016, with an intended award date of summer 2016. The contract period of performance is anticipated to be 24 months.

In this closed session, Governing Board Assistant Director for Psychometrics Sharyn Rosenberg will provide a brief overview of the plans for the grade 4 writing achievement levels setting and will seek feedback from COSDAM members on the essential elements of the procurement.

¹ In 2011, NAEP writing assessments were administered at grades 8 and 12 under the current Writing Framework, and achievement levels were set for grades 8 and 12. The grade 4 assessment initially was planned for 2013 administration but was postponed to 2017 due to budgetary constraints.

NAEP Linking Studies (2005 – 2015 NAEP Administration)



Green = Other NCES assessments; Blue = International assessments; Red = Assessments from state longitudinal data systems; Black = other



NAEP Linking Studies

NCES has conducted a variety of studies that link NAEP to other assessments or data sources. The Governing Board has also conducted several NAEP linking studies as part of its research program on academic preparedness for college. A brief summary of the studies that have been conducted over the past 10 years (or are currently planned or underway) is provided below:

- **2005 HSTS:** NCES periodically surveys the curricula of our nation's high schools and the course-taking patterns of high school students through its High School Transcript Study (HSTS). In conjunction with the administration of 12th-grade NAEP assessments, the HSTS also offers information on the relationship of student course-taking patterns to student achievement at grade 12. Transcripts were collected from seniors who graduated in 1987, 1990, 1994, 1998, 2000, and were collected again in 2005. Results from the 2005 study can be found at: <https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2007467>
- **2007 NAEP-ECLS-K:** NCES conducted this study to link results from the Early Childhood Longitudinal Study-Kindergarten Class of 1998-1999 (ECLS-K) and the NAEP 8th-grade assessments. One research study investigated the relationship between ECLS-K reading proficiency levels and 8th-grade NAEP achievement levels and explored the relationship between reading performance at earlier grades and performance on the 8th-grade NAEP reading assessment. The results were published in: **Dogan, E., Ogut, B., & Kim, Y. (2015).** Early childhood reading skills and proficiency in NAEP eighth-grade reading assessment. *Applied Measurement in Education*, 28(3), 187-201. Another research study investigated the concordance of student-reported parental education on the NAEP student background questionnaire with parent reports on the same variable from the ECLS-K questionnaire. The results were presented at a national conference: **Ogut, B. and Bohrnstedt, G. W. (2012).** Reliability of student-reported parental education at NAEP grade 8 mathematics assessment. Paper presented at the annual meeting of the American Educational Research Association, Vancouver.
- **2009 Preparedness Research**
 - **Statistical Linking of NAEP and the SAT:** The purpose of this study was to identify a reference point or range on the NAEP 12th-grade reading and mathematics scales that might be associated with the College Board's SAT preparedness benchmarks. The NAEP and SAT scores for 12th-grade students who had taken both assessments in 2009 were the basis for this linking. The report based on the results of this study can be found at:

https://www.nagb.org/content/nagb/assets/documents/what-we-do/preparedness-research/statistical-relationships/SAT-NAEP_Linking_Study.pdf

- **Longitudinal Analyses of Performance on NAEP Related to Performance in College and Other Outcomes of Florida Students:** The purpose of this study was to relate NAEP scores to ACT and SAT scores, college performance and other outcomes. Working with Florida state officials and their longitudinal database, scores for students who had participated in the 2009 NAEP 12th-grade assessments and were subsequently enrolled in Florida's public colleges in 2010 were linked to a variety of outcome indicators. Although data are still being collected and analyzed, the initial report can be found at:
https://www.nagb.org/content/nagb/assets/documents/what-we-do/preparedness-research/statistical-relationships/Florida_Statistical_Study.pdf
- **2009 HSTS:** The most recent installment of the HSTS was in 2009. The goals and design of the study were similar to those of earlier administrations. Results from the 2009 study can be found at: http://www.nationsreportcard.gov/hsts_2009/
- **2011 NAEP-TIMSS:** NCES initiated this study in an effort to link the National Assessment of Educational Progress (NAEP) scale to the Trends in International Mathematics and Science Study (TIMSS) scale so that states could compare the performance of their students with that of students in other countries. The study was conducted in 2011 with eighth-grade students in all 52 states/jurisdictions that participated in the NAEP mathematics and science assessments. The report based on the results of this study can be found at:
https://nces.ed.gov/nationsreportcard/studies/naep_timss/
- **2011 NAEP-PIRLS:** The purpose of this study was to obtain a statistical comparison between NAEP and the Progress in International Reading Literacy Study (PIRLS). The results of the 2011 NAEP grade 4 reading assessment were expressed in terms of the metric of the 2011 PIRLS assessment thereby providing international benchmarks for the NAEP grade 4 reading achievement levels. The report based on the results of this study can be found at: <http://files.eric.ed.gov/fulltext/ED545246.pdf>
- **2013 NAEP-HSLS:** Data for students who had participated in both the 2013 NAEP 12th-grade assessments and the 2009 High School Longitudinal Study (HSLS) were linked so that information from the HSLS student and parent questionnaires could provide a broader context for understanding NAEP results. In addition, the study explored using the relationship between the HSLS questionnaire variables and NAEP scores to predict NAEP mathematics scale scores for the full HSLS sample. The results from this research study are under review by NCES.
- **2013 NAEP-PISA:** NCES conducted a pilot study to investigate the feasibility of creating a statistical link between the NAEP mathematics scale and the Program for

International Student Assessment (PISA) mathematics literacy scale. Two states that participated in the 2013 NAEP state-level 12th-grade pilot and had participated in the 2012 PISA were included in this study. In each state, additional samples of students in grades 9, 10, and 11 were administered a version of the NAEP mathematics assessment. Although it was determined that establishing a statistical link between NAEP and PISA is feasible, the validity of the predicted PISA results requires further evaluation.

- **2013 NAEP-Lexile® Study:** The Lexile® framework and measures (owned by MetaMetrics®) include a vertical reading scale that spans grades 1 to 12, in addition to benchmarks for college and career readiness. The purpose of the study was to identify scores on the NAEP scale that correspond to preparedness benchmarks on the Lexile scale. To accomplish this link, a subsample of students in the 2013 NAEP assessment were administered Lexile items. Although it was determined that establishing a statistical link between NAEP and the Lexile measure is feasible, the validity of the results requires further evaluation.
- **2013 Preparedness Research:** As part of the Governing Board's preparedness research agenda, a variety of statistical linking studies are currently underway with the 2013 NAEP data. They include 1) linking of NAEP and ACT at the national-level and with a group of select states, 2) linking NAEP and SAT scores within one state, 3) linking to longitudinal databases at grades 8 and 12 with a group of select states, and 4) linking grade 8 NAEP and EXPLORE® with a group of select states. Results from the NAEP and EXPLORE linking study were shared at the August, 2015 Governing Board meeting. Additional results from the grade 12 analyses will be shared later this year.
- **2015 NAEP-ECLS-K:2011:** NCES conducted this study to link results from the Early Childhood Longitudinal Study-Kindergarten Class 2010-2011 (ECLS-K:2011) and the NAEP 4th-grade assessments. Students in the ECLS-K:2011 study who were also sampled for NAEP in 2015 were asked to complete a supplemental SES-related questionnaire at the conclusion of the NAEP administration. These student responses will be compared to responses provided by parents to similar SES-related questions. In addition, this study will make it possible to explore predictors of NAEP reading performance based on data collected from kindergarten to third grade as part of ECLS-K:2011.
- **2015 NAEP-TIMSS:** NCES plans on conducting the analysis for a national-level linking of the 2015 NAEP-TIMSS data.

Evaluation of NAEP Achievement Levels

Objective To receive a brief informational update on the current status of the independent evaluation of NAEP achievement levels that is being performed by the National Center for Education Evaluation and Regional Assistance (NCEE), part of the Institute for Education Sciences (IES). Ongoing updates will be provided at each COSDAM meeting.

Background

The NAEP legislation states:

The achievement levels shall be used on a trial basis until the Commissioner for Education Statistics determines, as a result of an evaluation under subsection (f), that such levels are reasonable, valid, and informative to the public.

In providing further detail, the aforementioned subsection (f) outlines:

(1) REVIEW-

- A. IN GENERAL- The Secretary shall provide for continuing review of any assessment authorized under this section, and student achievement levels, by one or more professional assessment evaluation organizations.
- B. ISSUES ADDRESSED- Such continuing review shall address--
 - (i) whether any authorized assessment is properly administered, produces high quality data that are valid and reliable, is consistent with relevant widely accepted professional assessment standards, and produces data on student achievement that are not otherwise available to the State (other than data comparing participating States to each other and the Nation);
 - (ii) whether student achievement levels are reasonable, valid, reliable, and informative to the public;-
 - (iii) whether any authorized assessment is being administered as a random sample and is reporting the trends in academic achievement in a valid and reliable manner in the subject areas being assessed;
 - (iv) whether any of the test questions are biased, as described in section 302(e)(4); and

- (v) whether the appropriate authorized assessments are measuring, consistent with this section, reading ability and mathematical knowledge.

(2) **REPORT-** The Secretary shall report to the Committee on Education and the Workforce of the House of Representatives and the Committee on Health, Education, Labor, and Pensions of the Senate, the President, and the Nation on the findings and recommendations of such reviews.

(3) **USE OF FINDINGS AND RECOMMENDATIONS-** The Commissioner for Education Statistics and the National Assessment Governing Board shall consider the findings and recommendations of such reviews in designing the competition to select the organization, or organizations, through which the Commissioner for Education Statistics carries out the National Assessment.

Evaluation of NAEP Achievement Levels Contract

The National Center for Education Evaluation and Regional Assistance (NCEE), part of the Institute for Education Sciences (IES), will administer the Evaluation of the NAEP Achievement Levels. On September 29, 2014, NCEE awarded a contract to The National Academy of Sciences to perform this work.

Objectives for the evaluation include the following:

- Determine how "reasonable, valid, reliable and informative to the public" will be operationalized in this study.
- Identify the kinds of objective data and research findings that will be examined.
- Review and analyze extant information related to the study's purpose.
- Gather other objective information from relevant experts and stakeholders, without creating burden for the public through new, large-scale data collection.
- Organize, summarize, and present the findings from the evaluation in a written report, including a summary that is accessible for nontechnical audiences, discussing the strengths/ weaknesses and gaps in knowledge in relation to the evaluation criteria.
- Provide, prior to release of the study report, for an independent external review of that report for comprehensiveness, objectivity, and freedom from bias.
- If the optional tasks are authorized by ED, plan and conduct dissemination events to communicate the conclusions of the final report to different audiences of stakeholders.

Design:

This study will focus on the achievement levels used in reporting NAEP results for the reading and mathematics assessments in grades 4, 8, and 12. Specifically, the study will review developments over the past decade in the ways achievement levels for NAEP are set and used and will evaluate whether the resulting achievement levels are "reasonable, valid, reliable, and informative to the public." The study will rely on an independent committee of experts with a broad range of expertise related to assessment, statistics, social science, and education policy. The project will receive oversight from the Board on Testing and Assessment (BOTA) and the Committee on National Statistics (CNSTAT) of the National Research Council. Members of the interdisciplinary review committee were selected in early 2015 (see below), and the committee is expected to meet over the course of 2015. The report from the evaluation is expected to be released in 2016 and will be announced on <http://ies.ed.gov/ncee/>.

Name	Affiliation
Dr. Christopher F. Edley, Jr. (Chair)	University of California, Berkeley
Dr. Peter Afflerbach	University of Maryland, College Park
Dr. Sybilla Beckmann	University of Georgia
Dr. H. Russell Bernard	University of Florida
Dr. Karla Egan	National Center for the Improvement of Educational Assessment
Dr. David J. Francis	University of Houston
Dr. Margaret E. Goertz	University of Pennsylvania
Dr. Laura Hamilton	The RAND Corporation
Dr. Brian W. Junker	Carnegie Mellon University
Dr. Suzanne Lane	University of Pittsburgh
Ms. Sharon J. Lewis	Retired
Dr. Bernard L. Madison	University of Arkansas
Dr. Scott Norton	Council of Chief State School Officers
Dr. Sharon Vaughn	The University of Texas at Austin
Dr. Lauress L. Wise	HumRRO

Additional information about the Committee and project activities is available at: <http://www8.nationalacademies.org/cp/projectview.aspx?key=49677>. The first Committee meeting took place in Washington, DC on February 19-20, 2015. Governing Board staff attended the open session and made a presentation to the Committee on the history of the NAEP achievement levels setting activities. The second meeting of the Committee took place in Washington, DC on May 27-28, 2015. Governing Board staff attended the open session on the afternoon of May 27th to listen to panel discussions about interpretations and uses of NAEP achievement levels. Five additional meetings were conducted in the latter half of 2015 in closed session. The final report is expected to be released in mid-2016.

PARTICIPANT ENGAGEMENT IN NAEP: CRITICAL REVIEW AND SYNTHESIS OF RESEARCH

BACKGROUND

In September 2015, the Governing Board awarded a contract to AnLar Incorporated, along with its subcontractors, Abt Associates and Minds Incorporated, to conduct a systematic literature review documented via an annotated bibliography and synthesis summary, addressing what the field knows about the extent to which sub-optimal engagement may affect NAEP student performance and NAEP test administration.

PROJECT MILESTONES

DESIGN DOCUMENT

Following initial project kick-off meetings, AnLar submitted a final Design Document and project plan on December 15, 2015. The Design Document articulates the methodology of the project, including search strategy, article selection, and coding process. This document also articulates the process for screening resources for inclusion or exclusion using four phases:

*Phase 1: **Relevance:*** For all collected resources, Phase 1 identifies if the resource is an empirical study and if it is relevant to the research questions, using information based on titles, abstracts, and key words.

*Phase 2: **Methodological Rigor:*** Applying methodological standards for observational, intervention, psychometric, and descriptive studies to all resources deemed relevant in Phase 1, Phase 2 records data such as statistical methodology, data reliability, and equivalence baseline differences. Studies that meet a minimum level of rigor against either the Osborne Framework¹ or the What Works Clearinghouse² will move on to Phase 3.

¹ Osborne, J. (2010). Correlation and other measures of association. In Hancock, G. R. & Mueller, R. O. (eds.) Reviewer's guide to quantitative methods. Routledge: New York. (pp-55-69). Available at: <https://books.google.com/books?id=O3GMAgAAQBAJ&lpg=PA55&ots=qUya-33OiR&dq=osborne%20correlation%20and%20other%20measures%20of%20association&pg=PA55#v=onepage&q=osborne%20correlation%20and%20other%20measures%20of%20association&f=false>

² WWC standards:
http://ies.ed.gov/ncee/wwc/pdf/reference_resources/wwc_procedures_v3_0_standards_handbook.pdf

Phase 3: Full Coding of Eligible Studies: Phase 3 collects more study details, including the study design, variables, findings, and limitations.

Phase 4: Comprehensive Critical Analysis: For a sub-set of the “most influential” eligible studies, Phase 4 engages deeper examination, including critiques of study methodologies, inferences, and conclusions. The primary factor in choosing which studies are most influential will be the number of times a study is cited.

CODE BOOK

As a result of the development of the Design Document and discussions regarding methodology with Board staff, AnLar developed a Code Book to specify information and data that will be collected for all resources included in the literature review. The Code Book aligns with the four phases delineated above, and is the basis for the questions in the online coding tool to be used by researchers in the coding process. These questions also reflect refinements prompted by the tool development and the Research Associate (RA) training process. The Research Associate responses in the online coding tool are gathered in a single spreadsheet enabling comparisons across multiple articles or codes.

RESEARCH ASSOCIATE (RA) TRAINING

AnLar conducted RA training in late December 2015 through early January 2016. The RA training period began with an orientation led by co-Project Director, Ariel Jacobs and Principal Researcher, Dr. Joseph Taylor. The orientation included an overview of the project, the search and coding process, and the RA training schedule. For the training, the two Research Associates, Amelia Barter and Allison LaFave, coded the same article using the online coding tool and the AnLar team convened weekly to review codes, address clarifying questions, and make necessary adjustments to the code book to ensure that data collection captured a sufficient level of detail.

RESOURCE SEARCH AND COLLECTION

Throughout December 2015 and January 2016, the Research Associates conducted searches of ERIC, Web of Science, Institute of Education Statistics (IES), and Teachers College Record using the search strings detailed in the Design Document. AnLar was also provided with a list of potentially relevant resources by the National Center for Education Statistics (NCES). All resources that appeared to be minimally relevant – 969 articles – were recorded in a Study Identifier Directory spreadsheet with a unique identifying number. Additionally, during the relevance screening (Phase 1), researchers harvested the references section of all relevant resources and added all applicable resources to the Study Directory. As of January 2016, the total number of resources screened in Phase 1 was 1,026. All resources processed through Phase 1 were duplicate-coded by both RAs. For items where there was disagreement or uncertainty, the Principal Researcher acted as the reconciler.

Based on preliminary screening, AnLar estimates that approximately ten (10) percent, or 100 studies, of the total resources screened will meet the project’s standards for relevance. Key

standards of relevance include: whether the resource addresses student motivation and/or engagement in NAEP; if the resource is an empirical study; if the examinee sample is within the range of interest (between 4th and 12th grade); and if the publication date is 1990 or later.

Operational coding of resources began on January 18, 2016, and all resources will proceed through Phase 1: Relevance screening of operational coding. AnLar is scheduled to submit a draft list of relevant resources and a draft Systematic Review Table to the Governing Board for review and discussion by mid-March 2016.

TECHNICAL REVIEW AND BIBLIOGRAPHY

The final list of relevant resources will proceed through Phases 2-4 and data from the coding process will be entered into a Systematic Review Table. If there are too many studies to duplicate-code in Phases 2 and 3, RAs will duplicate code 15-20% of the resources and independently code the remainder. The Principal Researcher will code a random sample of 20 resources and report inter-rater reliability coefficients. Relevant resources that meet the empirical evidentiary standards will be included in an annotated bibliography detailing methods, claims, findings, and conclusions. This technical review and annotated bibliography will be completed by May 2016.

SYNTHESIS REPORT

All study information captured in Phases 3 and 4 will be presented in a comprehensive synthesis report to summarize findings and overall conclusions most relevant to NAEP, while noting and explaining points of agreement and disagreement. As context, study information related to rigor (Phase 2) will be summarized. The synthesis report will also present recommendations for future research. The report will be submitted to the Governing Board by June 2016 and will be presented to COSDAM during the August 5, 2016 meeting.