Forum on Text Readers for Everyone on All Tests: Getting a Handle on What This Means

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**Forum on Text Readers for Everyone on All Tests –
Getting a Handle on What This Means**

Background
More than 80 individuals representing staff from state departments of education, school districts, testing and testing-related companies, and other educational organizations participated in a forum on June 27, 2017 in Austin, Texas to discuss the availability of text readers for everyone on all tests, the differences in terminology for text readers, ways to develop common language around text readers, and challenges associated with text readers. The forum was a pre-session to the Council of Chief State School Officers (CCSSO) National Conference on Student Assessment (NCSA), and was a collaboration of the Assessing Special Education Students (ASES) State Collaborative on Assessment and Student Standards (SCASS), the English Learner (EL) SCASS, and the National Center on Educational Outcomes (NCEO).

Specific goals of the pre-session forum were to address: (a) research needs for text to speech, (b) common terminology and definitions that more precisely describe the types of text to speech so that these descriptions can be used in states' requests for proposals (RFPs) for assessment development, and (c) implementation and policy challenges associated with text readers and ways to address them. Each of these topics was considered in light of the needs of general education students,[1] students who are English learners (ELs), and students with Individualized Education Programs (IEPs) or 504 plans; these considerations were discussed in breakout sessions.

Purpose
The purpose of the forum on text readers for all students was to develop greater clarity on the implementation of text readers for all students, and to discuss the issues surrounding the use of text readers for all students. This topic grew out of previous discussions about implementing accessibility frameworks for all students and the need for common language to discuss accessibility features and accommodations (see Warren, Thurlow, Christensen, Shyyan, Lazarus, & Chartrand, 2016[2]). Among the questions addressed in the forum were those related to the evidence of the validity of results when text readers were used by different students. A major question posed was whether it is possible to develop policy and a common language for text readers and text to speech to counteract the current situation where these terms (and others) mean different things to different people. Related questions included whether language translations should be provided through text to speech options, and the kinds of resources and training needed by

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[1] Students who are in general education classrooms and are not identified as a student with a disability or an English learner (EL) are referred to in this report as "general education students." It is recognized that students with IEPs and 504 plans, as well as ELs, are also general education students, but for purposes of brevity here, we use the term "general education students" to refer to those students who do not have disabilities and are not ELs.
[2] Warren, S., Thurlow, M., Christensen, L., Shyyan, V., Lazarus, S., & Chartrand, A. (2016). *Forum on common language for states and assessment vendors.* Minneapolis, MN: University of Minnesota, National Center on Educational Outcomes. Available at https://nceo.umn.edu/docs/OnlinePubs/2016ForumReport.pdf.

educators, parents, and students to support better decision making and implementation of text readers and text to speech.

The pre-session forum started with the presentation of information on current state policies on text readers (including the terminology used, and the ways in which text readers were treated in policy). Then three perspectives on text readers were provided: (a) researcher perspective, (b) vendor perspective, and (c) state perspective. Following these presentations, attendees broke into groups to discuss text readers in relation to three groups of students:

1. General education students
2. ELs
3. Students with IEPs or 504 plans

Each of these groups addressed several questions, including:

1. What research is needed about text to speech?
2. What common terminology and definitions should be used to more precisely describe text to speech so that they can be used in RFPs?
3. What are the implementation and policy challenges that need to be addressed?

Although participants had limited time for discussion, the discussions were rich and engaging. The agenda for the three-hour forum was as follows:

- Welcome and introduction (Sandra Warren, CCSSO ASES SCASS)
- Overview of issues (Martha Thurlow, NCEO)
- Results of state policy analysis (Sheryl Lazarus and Kathy Strunk, NCEO)
- Issues from three perspectives:
  — Researcher (Cara Laitusis, ETS)
  — Vendor (Peter Ramsdell, Texthelp)
  — State (Melissa Gholson, West Virginia Department of Education)
- Breakout discussion sessions
  — Students with IEPs and 504 plans (2 sections; one facilitated by Sandra Warren, CCSSO; one facilitated by Maureen Hawes, NCEO)
  — English learners (facilitated by Martha Thurlow, NCEO)
  — General education students (facilitated by Sheryl Lazarus, NCEO)
- Debrief and next steps

Structure of this Report
This report summarizes both the introductory information provided to forum participants, and the facilitated forum discussions that followed. Summaries of the presentations were developed from notes taken during the presentations, and from the presenters' slides. Summaries of the facilitated discussions were developed from notes taken by notetakers.

Participants were encouraged to comment and discuss freely, with assurances that no individual's name, nor any state, company, or organization would be attached to comments that were made. Complete anonymity of statements was ensured. This led to frank and open conversations.

Forum Introduction
Sandra Warren, CCSSO ASES SCASS Advisor, provided an overview of the forum and recognized the hosts—ASES SCASS, EL SCASS, and NCEO. She raised questions about text readers and text to speech, then confirmed that the goal of the forum was to begin to develop clarity on the implementation of text readers for all students, and to discuss the issues surrounding the use of text readers for all students.

Forum Overview
Martha Thurlow, NCEO, highlighted the goals of the session and presented the questions that would be addressed during the session. She assured participants of the desire for open and candid conversations, and noted that a report would be produced as a result of the discussions. She also noted that in addition to the report on the pre-session forum, guidance would be developed for states to use in drafting language on text readers or text to speech in their RFPs.

State Policy Analysis
Sheryl Lazarus and Kathy Strunk of NCEO presented preliminary results of a state policy analysis being conducted by NCEO. They noted that the purpose of the analysis was to provide a snapshot of how accessibility features and accommodations that use technology to deliver text in an assessment are included in state policies, specifically focusing on English language arts (ELA) and math assessments for the 2016-17 school year. They highlighted the variety of terms that are used in states' policies and summarized the ways in which text readers (or text to speech and other terms used) were presented in state policies (e.g., as accessibility features or accommodations) depending on the content (e.g., directions, items, or passages for ELA and mathematics).

Three Perspectives on Text Readers

Research Perspective: Cara Laitusis, ETS
Cara Laitusis addressed what the research literature says about text to speech. She provided an overview of recent meta-analyses and their findings. She noted that she preferred to lump everything together as "read aloud," and using the term "text to speech" to refer to a synthetic voice. The findings of three recent meta-analyses were

summarized.[3] According to Laitusis, the overall findings from these meta-analyses indicated that many of the studies in the meta-analyses compared psychometric properties. They also included a variety of audio presentation options, including text to speech, prerecorded text to speech, prerecorded human audio, human proctors, as well as other characteristics of the audio presentation (e.g., individual vs. group administration; student-paced vs. computer or proctor paced; different text that could be read such as words, phrases, or sentences, and directions, questions and answer options, or also passages). The studies also covered a range of grades and item types. Laitusis concluded that taken together, "read aloud" improves scores, but effect sizes are larger for reading than for math for students with disabilities and students without disabilities. Also differential performance gains tend to be found on reading tests, but they are minimal or nonexistent on math tests. She noted that scores with and without the read aloud seem to be psychometrically comparable. She also noted the limited research on predictive validity, but that predictive validity research using teacher ratings and those using college readiness indicators have conflicting results.

Next, Laitusis talked about the challenges of conducting research on text readers and text-to-speech. These included defining the construct to be measured. It is important to ask whether "reading" includes decoding of print by touch or sight. A related question is whether there is a grade level at which comprehension takes over an emphasis on decoding, if there is one. Also, it is important to know what is being predicted by the assessment score, if anything. Finally, old research paradigms (e.g., differential boost) may not work if there are item-level accommodations available.

Laitusis then suggested the areas of need for future research studies. These included new research paradigms (other than differential boost for single accommodations or tools). Also, it is important to focus more on the predictive validity of a total score. Finally, she indicated that there should be more descriptive analyses of operational test data and surveys that get at the longitudinal use of accommodations, and especially data by items on whether assigned features were used, what other features were used with text to speech, and so on.

Laitusis concluded by providing a vision of three things she would do if she "ruled the world" of assessment. First, she would change policy to only allow independent forms of read aloud on reading tests (e.g., text to speech; screen reader). Second, for students in grades 3-5, she would include a supplemental measure of oral reading fluency whenever a read aloud feature is provided on a reading test. Third, she would capture data on longitudinal use of accommodations (for predictive studies), as well as specific accommodations used by item and item elements (passage, stem, etc.) and make the data

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[3] The three meta-analyses were: (a) Buzick, H. M., & Stone, E. A. (2014). A meta-analysis of research on the read aloud accommodations. *Educational Measurement: Issues and Practice, 33*(3), 17-30; (b) Li, H. (2014). The effects of read-aloud accommodations for students with and without disabilities: A meta-analysis. *Educational Measurement: Issues and Practice, 33,* 3016; and (c) Wood, S. G., Moxley, J. H. H., Tighe, E. L., & Wagner, R. K. (2017). Does use of text-to-speech and related read-aloud tools improve reading comprehension for students with reading disabilities? A meta-analysis. *Journal of Learning Disabilities,* 1-12.

available to researchers, along with data from a student survey on the instructional accommodations that students use.

Vendor Perspective: Peter Ramsdell, Texthelp
Peter Ramsdell highlighted considerations for the use of read aloud, addressing both human-provided, external (such as a screen reader), and embedded (as part of the testing platform). His points of consideration, each of which he addressed in more detail, included: types of read aloud; read aloud controls and navigation; choices affected by the assessment delivery; external versus embedded read aloud tools; pronunciation editing; and practice opportunities. Ramsdell emphasized that it is critical to keep the purpose of the assessment and the objectives for providing the read aloud in mind when working through the various options.

Ramsdell briefly talked about human read aloud, which could include different types. Three types mentioned were: (a) staff member reading to the student, (b) audio file with a human voice on a CD for a paper test, and (c) audio file linked to items within a digital test. For the digital variety of read aloud, there also are many options that need to be considered: text-to-speech read aloud, computer read aloud, read aloud with a human synthesized voice, read aloud with a high-quality human synthesized voice, and other varieties. He noted that all this variety implies that the writer of an RFP needs to be very specific about what is really wanted.

Ramsdell noted also that the visual aspect of the digitally presented read aloud is very important. For example, there can be read aloud with a visual stimulus. There can be read aloud with highlighting that is synchronous with the reading. There can be highlighting with dual color synchronous highlighting. Further, there are many options for how the highlighting occurs—by word, by sentence, or the options of both. Controls and navigations were another important aspect of read aloud that needs to be selected carefully. Among the control options are those that address speed (slow, medium, fast) or volume, and color combinations for highlighting. Possible options for navigating through the item includes from top to bottom, self-selection of sentences or words, and the possibility of re-reading sentences. Also important to consider is whether the ability to read aloud needs to be blocked from any areas of the text (e.g., reading passages). Because read aloud can be variable in quality, the RFP should define desired pronunciation editing, and how math equations and other aspects of math items should be handled. The RFP also needs to make clear that time and funding has to be provided within the schedule to allow for someone in the state (or hired by the state), but not the vendor, to listen to all read aloud and identify needed adjustments to correct pronunciations.

Ramsdell identified two additional considerations during his presentation. One was the nature of the assessment delivery, including whether all is on the cloud (which requires constant access to the Internet, which is a problem for many schools), a web server within the district (which does not require Internet), or a test delivery system in which the test is delivered to the student device, and then after that the Internet is not needed. The question of whether the browser should be locked down so that nothing else can be

opened is also an important decision to be made about the assessment delivery. Finally, Ramsdell emphasized the importance of practice, indicating that the availability of practice items that provide the read aloud as it will be provided during the test is critical for success. That caution applies whether the read aloud is external or embedded.

State Perspective: Melissa Gholson, West Virginia Department of Education
Melissa Gholson addressed a number of considerations during her presentation, including accessibility concerns, test administration considerations, legislation and legal issues, auditory and cognitive processing considerations, and a variety of other considerations. She started by noting that in West Virginia, the monitoring of test accommodations is a requirement for all students with disabilities. Thus, she knows that for these students, text to speech was the most frequently provided accommodation in her state for the assessment, even though it is not clear that it is actually being used that frequently during instruction. During instruction it is possible that students are using a Google-type voice on various devices, but that would be inconsistent with what is used for the assessment. She noted several other concerns about accessibility, including the lack of professional development or training other than assistive technology (AT) programs in special education, the variation in expertise in different districts, and the lack of research on the impact of text to speech for some subgroups.

In terms of test administration, Gholson recognized that providing universal text to speech would be easier from a test administration perspective, but that there are many issues associated with the provision of text to speech that would likely be even more problematic if text to speech was available to all. For example, text to speech is the leading cause of most test administration breaches, and uploading embedded accessibility features from student plans requires a high level of technical expertise, as well as monitoring. There are also a host of technology issues, including updates, voice quality, and assuring that the text to speech is actually working or available.

Gholson noted several legislation and legal issues related to text to speech. IDEA defines requirements for AT, but IEP teams struggle with the provision of a free appropriate public education (FAPE) for students who require AT services or devices. Further, professional development is critical for successful use of AT and text to speech. Gholson also noted research that indicated school districts tend to lose cases when they fail to provide AT.

In addressing auditory and cognitive processing considerations, Gholson noted that many students have auditory processing disorders that make it difficult to recognize small differences in sounds; these affect working memory, executive attention, processing speed, and alerting attention, all of which seem to be correlated with poor literacy and numeracy. Students with these disorders, many of whom are undiagnosed, are likely to struggle when provided the use of text to speech because they cannot auditorily process all the information.

There are many other considerations that should be addressed concerning text to speech. Gholson identified a long list of these, some of which were: impact on online systems,

costs associated with headphones, assumption that all students will know how to use the text to speech functions well, huge need for professional and policy development, impact on college entrance exams, and impact on technical quality.

Summary of Small Group Discussions

After the rich presentations summarized here, meeting participants divided into three discussion groups: one group discussed issues for general education students; one group shared perspectives on the ELs; and two groups focused their discussions on students with disabilities. Each group targeted the conversation to address three questions:

1. What research is needed about text to speech?
2. What common terminology and definitions should be used to more precisely describe text to speech so that they can be used in RFPs?
3. What are the implementation and policy challenges that need to be addressed?

The group discussions are summarized here following the question format that was used for the discussion. The term "text to speech" is used in these notes to cover all text reader approaches.

Students in General Education

What research is needed about text to speech?
The group had a rich discussion about text to speech and its availability to students who are not ELs and who do not have a disability. Participants identified several issues that could be addressed through research. Specific comments included:

- Research needs to examine the extent to which text to speech is being used by students who are not ELs and who do not have disabilities.
- Research should examine those characteristics of students that would suggest that text to speech would meet their accessibility needs.
- Research should highlight best practices for decision making about the consequences of text to speech for general education students, including whether it benefits them or creates negative consequences.
- Research should examine the perspectives of several stakeholder groups, including students, parents, teachers, education leaders, and vendors.
- Several additional specific research questions were identified by the group, including;
  — How well do educators understand the meaning and ramifications of test results when students used the text-to-speech feature?
  — What are the best ways to monitor the use of text to speech when it is selected for a student?
  — What is the impact on the validity of assessment results when general education students use text to speech for reading assessments compared to

math assessments, and also for different aspects of the assessment (e.g., directions, items and response options, passages)?
— What is the impact on the rendering of text to speech when there is a change from one vendor to another?
— How do the technology skills of educators and students affect the use of text to speech?
— How do non-embedded text-to-speech tools compare to speech that is part of the test platform in terms of accessibility, use, and impact on test results?
— What is the impact of the technology tools that students use as part of daily instruction (e.g., capabilities of browsers, etc.) on the use of text to speech during the assessment?

What common terminology and definitions should be used to more precisely describe text to speech so that they can be used in RFPs?
The group briefly discussed terminology and definitions that could be used to more precisely describe text to speech for use in RFPs. Among the comments were the following;
- An organization should be identified to standardize language related to text to speech (e.g., IMS Global, NCEO).
- Remember that the original term used to refer to various approaches to reading text was "oral reader"; this is still an important accommodation for both paper/pencil and computer-based tests.

What are the implementation and policy challenges that need to be addressed?
The group generated numerous points on the challenges for both implementation and policy. Specific challenges and needs that were mentioned included:
- Providing professional development. Training for educators needs to include:
  — How to use the assessment's unique text-to-speech technology.
  — Carrying out necessary steps before and during the assessment.
  — How to identify individual student needs and make wise decisions about the use of text to speech based on those needs.
  — How to monitor a student's use of text to speech.
- Building awareness that text to speech may not be beneficial for all students.
- Providing opportunities to use the assessment's form of text to speech during instruction and during practice tests.
- Monitoring use of text to speech given limited funding and staffing, vendor changes, and lack of ability to enforce state guidance about the use of text to speech.
- Limitations created by the procurement process, which makes it difficult to select the optimal text-to-speech tool.
- How to control the use of text to speech so that it is advantageous to everyone.

Students Who Are English Learners (ELs)

What research is needed about text to speech?
The participants acknowledged that ELs had largely been ignored on research related to text to speech. As a results, numerous ideas for research about text to speech for this group were identified. They included:

- Research needs to include more EL studies; ELs are included much less frequently than students with disabilities or even ELs with disabilities.
- Data used to identify ELs to include in research needs to be cleaned up so that any extant data analyses are clear about the characteristics of the students included in the research.
- Research is needed on subgroups of students within the EL group (e.g., groups based on level of English proficiency; groups based on whether language is right to left in orientation rather than left to right).
- Research should be conducted on using text to speech with other features intended for ELs, including for example, being able to use text to speech on stacked translations (which would require toggling back and forth between text to speech in different languages).
- Research is needed on tools that might help educators make decisions about whether individual ELs would benefit from text to speech.
- More innovative research techniques need to be used for ELs, including cognitive labs and case studies; these approaches are especially important given the small numbers of students in many locations.
- Cognitive load requirements of text to speech for ELs needs to be studied.

What common terminology and definitions should be used to more precisely describe text to speech so that they can be used in RFPs?
The group made several suggestions for how to get to a set of common terminology and definitions of text to speech that would be appropriate for inclusion in RFPs, including:

- Gather information on current terminology used by states and vendors, and develop a crosswalk of all the aspects that states need to think about when writing RFPs; this will help them know specifically what they should be considering and requesting. Much of the start of these aspects can be pulled from the comments of the presenters in the pre-session.
- Create a document that cautions states to read all of the small print in proposals that they receive in response to an RFP because sometimes the small print contradicts the features intended by the state.
- Think about desired characteristics even if they do not appear in a crosswalk based on what is available now. For example, if an assessment provides the ability to gloss words by hovering over them, it might be desirable to have the glossed word available in text to speech rather than only in print.
- Include requirements related to system updates. A text vendor's system for text to speech must continue to work as intended even when software is updated.

Similarly, include requirements that text to speech (and other accommodations) will work with all the different browsers that schools might use.
- RFPs possibly should include requirements to train proctors on the provision of text to speech (as well as other assessment features).

What are the implementation and policy challenges that need to be addressed?
A brief conversation about implementation and policy challenges in relation to text to speech and ELs was held by the group. The following points were made about implementation and policy challenges:
- Ensuring that state superintendents/chiefs know about the important of consistency in the provision of text to speech is critical.
- Convincing state superintendents/chiefs that the state's English language proficiency assessment is as important as the state's ELA, mathematics, and science assessments, and that text to speech and other accommodations are important for that assessment as well.
- Different offices in the same state create different RFPs, and as a result the English language proficiency assessment in the state often has different features (and different text-to-speech features) from the content assessments.
- Most English language proficiency assessments are not accessible to subsets of ELs, especially ELs who are deaf and ELs who are blind; this is a huge area of need and has some implications for text to speech.

Students Who Have IEPs or 504 Plans

Because of large numbers, two groups of participants talked about students who have IEPs or 504 plans. The notes from the two groups have been merged here.

What research is needed about text to speech?
Participants in the two groups identified numerous research ideas for text to speech. Specific suggestions included:
- A finer-grained analysis of the effects of various approaches to reading text is needed (e.g., text to speech versus read aloud) by different user groups (e.g., disability category).
- Research should address the impact of qualified human readers and the monitoring of consistency of these readers.
- Research is needed on the actual use of text to speech (and read aloud) in instruction and the impact of use in instruction on assessment performance.
- Research is needed on the decision-making process—are these decisions actually being made by IEP teams for students receiving special education services?
- Research should address the post-school experiences of students who use text to speech.
- More and clearer research is needed on the effects of text to speech for reading assessments.

- A related research focus includes determining when (e.g., which grades) assessments should move from focusing on decoding to comprehension and how these decisions are made.
- Data need to be captured on whether students actually use text to speech when it is assigned to them; these data are essential to answering many questions about text to speech.
- The research that has been conducted by the consortia on text to speech should be summarized and made public. Comparisons of results for PARCC and Smarter Balanced would be interesting because they used different means for providing text to speech.
- Longitudinal studies are needed, especially with younger students who are digital natives.
- Research is needed to compare the nuances of features of text to speech in mathematics and other areas.
- Research needs to include students with disabilities in cognitive labs that include text to speech.
- Case study research is needed.

What common terminology and definitions should be used to more precisely describe text to speech so that they can be used in RFPs?
Participants made numerous comments about the possibility of common terminology and definitions for text to speech. Among those comments were the following:
- Different" terms" are used, but there is a need to know the similarities and differences in what the terms mean are.
- It is likely that if text to speech is selected for a student, other accessibility features or accommodations might be needed (e.g., separate/small group setting). This type of information, perhaps in policy or guidelines, would be helpful.
- Text to speech is not a specific enough term. All the options (e.g., synthesized voice, human voice audio, third party compatibility, etc.) need to be detailed (including the quality of options) so that a state can identify what it wants and put that in its RFP.
- It would be helpful to develop a standardized language that could be published, perhaps something like the Common Education Data Standards.
- It is important to keep up with innovations because text to speech is always evolving.
- It might be helpful to look at IMS Global as a starting point for moving toward a common language.

What are the implementation and policy challenges that need to be addressed?
Numerous implementation and policy challenges were identified by the groups. These included:
- Educators, technology coordinators, and other appropriate personnel need training on the selection and administration of assessments with text to speech.
- Text to speech should be used in the classroom before it is used on the test; the features of text to speech should be the same in both instruction and assessment.

- It is important to provide information about text to speech to parents in order for them to make decisions about the use of text to speech with their child and the child's teacher; this is made more challenging due to the continuously changing nature of text-to-speech terminology.
- Teachers and students need the opportunity to become familiar with, and practice using, text-to-speech tools before the test (including use in a comparable browser as used in the assessment).
- Policy about text to speech is made more challenging because of differences at both state and district levels.
- There are many quality control needs associated with text to speech that should be addressed before students take the assessment. For example, changing the speed of the text has in some cases resulted in emphasizing an answer choice.
- It is important for states to know (and be clear in the RFP) the desired quality of each of the text-to-speech components/features.
- It is important to take time to review the RFP for quality; a review panel is important to ensure that the definition is clear and that the text-to-speech features are those that are intended.
- All technology options have both pros and cons that must be considered, including text to speech. One of the many challenges of text-to-speech implementation is the need for a larger Internet bandwidth when using higher qualities of voice talent.
- A summary of lessons from the field about text to speech overall (including in RFPs) would be useful for all states.
- Policies and professional development are needed that address the use of text to speech by students with auditory processing challenges.

Conclusion

The meeting closed with debriefs from each of the groups, and concluding remarks by Dr. Martha Thurlow, Director at NCEO. She thanked participants for their thoughtful discussion and confirmed that a report on the pre-session would be available before the end of the summer. She also noted that NCEO would work on the suggestions made by the presenters and groups for developing definitions and language that would be useful for states as they develop RFP language about text to speech.