



Forum on Speech- to-Text and Scribing: Getting a Handle on What This Means

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Forum on Speech-to-Text and Scribing: Getting a Handle on What This Means

Background

More than 45 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 26, 2018 in San Diego, California to discuss speech-to-text and scribing, the differences in terminology, challenges associated with speech-to-text, and needed research. 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), the State Collaborative on Assessment and Student Standards (SCASS), and the National Center on Educational Outcomes (NCEO).

Specific goals of the pre-session forum were to: (a) begin to identify and discuss the issues surrounding speech-to-text and scribing; (b) identify policy needs for speech-to-text and scribing; (c) learn about assessment vendor speech-to-text and scribing tools; and (d) discuss implementation challenges 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 was to develop greater clarity on the implementation of speech-to-text and scribing during instruction and assessments. Its purpose also was to discuss the current and emerging issues surrounding the uses of speech-to-text 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, Lazarus, Strunk, & Thurlow, 2017²; Warren, Thurlow, Christensen, Shyyan, Lazarus, & Chartrand, 2016³). Among the questions addressed in the forum were those related to the evidence of the validity of results when speech-to-text is used by different students. A major question posed was how states can work with vendors to develop speech-to-text systems that more smoothly interface with the test

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. H., Lazarus, S. S., Strunk, K., & Thurlow, M. L. (2017). *Forum on text readers for everyone on all tests: Getting a handle on what this means*. Minneapolis, MN: University of Minnesota, National Center on Educational Outcomes. Available at <https://nceo.umn.edu/docs/OnlinePubs/2017ForumReport.pdf>

³ 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>.

delivery system. Further, what guidance is needed related to student use of their own devices for speech-to-text during testing? Related questions included how to address potential security issues and when it is appropriate for human scribes to scribe the speaking portion of an English language proficiency assessment to produce a transcript. Finally, what kinds of resources and training are needed by educators, parents, and students to support better decision making and implementation of speech-to-text and scribing.

The pre-session forum started with the presentation of information on current state policies on speech-to-text (including the terminology used, and the ways in which speech-to-text is treated in policy). Then three perspectives on speech-to-text readers were provided: (a) state perspective, (b) assessment consortium perspective, and (c) vendor 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 are the implementation and policy challenges that need to be addressed?
2. How can states work with vendors to get speech-to-text systems that more smoothly interface with the test delivery system?
3. What research is needed for speech-to-text?

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:
 - States (Andrew Hinkle, Ohio Department of Education; Toni Wheeler, Washington Office of Superintendent of Public Instruction)
 - Test Vendor (Jan McSorley, Pearson)
 - Assessment Consortium (Trish Klein, Smarter Balanced)
- Breakout discussion sessions
 - General education students (facilitated by Sheryl Lazarus, NCEO)
 - ELs (facilitated by Martha Thurlow, NCEO)
 - Students with IEPs or 504 plans (2 sections; one facilitated by Sandra Warren, CCSSO; one facilitated by Maureen Hawes, 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 and NCEO. She raised questions about speech-to-text and scribing, then confirmed that the goal of the forum was to begin to develop clarity on the implementation of speech-to-text for all students, and to discuss the issues surrounding the use of speech-to-text 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.

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 speech-to-text in an assessment are included in state policies, specifically focusing on English language arts (ELA) and math assessments for the 2017-18 school year. They highlighted the variety of terms that are used in states' policies (e.g., speech-to-text, voice recognition), and summarized the ways in which speech-to-text and scribing are 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). Also addressed were the issues related to the use of a speech-to-text as assistive technology device interacting with a test platform.

Four Perspectives on Text Readers

State Perspective: Andrew Hinkle, Ohio Department of Education

Andrew Hinkle noted the importance of the topic by summarizing the exponential increase in requests for speech-to-text in Ohio, from zero requests in 2015 to 67 requests for speech-to-text in 2018. For a student to be able to use speech-to-text, a school

representative has to approach the test vendor for a permissive mode administration, meaning that the security constraints have to be turned off.

Hinkle described the process that the state had used to gather information on the use of speech-to-text during the state assessment. Experts in the state and other experts were asked about the use of speech-to-text in the classroom and for testing. These individuals identified many issues, including difficulties encountered in making it work in the classroom; test security issues in turn requiring test administration to be done in a one-on-one testing situation; the additional time needed to train teachers, test administrators, and students how to use the speech-to-text software; and increased cognitive load demands on the student.

Hinkle also noted other issues. For example, even though the state's assessment system has a high web accessibility rating, nothing external (which is what speech-to-text is) really works well with the system. Further, there are questions about whether the construct of writing is compromised when speech-to-text is used. Finally, if speech-to-text is allowed, there will be a need for a lot of professional development.

Hinkle concluded his presentation with a set of questions that need to be answered:

- How do we determine whether a student needs a scribe or speech-to-text?
- Which "scribe" approach is best for a student and provides the best access?
- How do we develop skills in using speech-to-text with students?
- How will districts provide software and training to provide access equally for all learners?
- How will we evaluate that the support provides access and does not inhibit performance?
- What process will be used to evaluate whether additional services are needed?
- How do we support districts in professional development across settings?

State Perspective: Toni Wheeler, Washington Office of Superintendent of Public Instruction

Toni Wheeler reinforced the importance of the topic by documenting the dramatic shift in the use of technology in the state. Cloud-based devices are being used by more than 50% of districts, and almost all of the rest are considering the use of these devices. Related to speech-to-text, there have been increases (up to 60%), and at the same time, there has been a decrease across years in the requests for non-standard accommodations using word prediction software. The state response was to have districts understand the features of the program and then conduct their own evaluation. This in turn produced the increased interest in speech-to-text.

The state involved four groups in the discussion about a host of speech-to-text-related software: assessment; instructional technology; the special education technology center; and the state's test vendor. Several software options were reviewed. This process identified many compatibility challenges, including software that initially appeared to work but then subsequently did not.

Wheeler also noted the innovative approaches that districts were using to “fix” the incompatibility problems that arose. For example, some simply had the student use an unfamiliar device or software to access speech-to-text features. Others had the student use their classroom machine for speech-to-text, then had them access the assessment on a second machine, with a scribe then transcribing the student’s responses into the text delivery platform. Still others simply used a scribe in place of the typical software, application, or device.

Wheeler concluded by noting some concerning unintended consequences of the challenges with speech-to-text. First, districts are using programs or software that do not align with the technology shifts. Second, what works for the test delivery platform is driving what IEP teams are selecting for students to use during instruction.

Assessment Vendor Perspective: Jan McSorley, Pearson

Jan McSorley noted that her years as an Assistive Technology Specialist and a special educator influenced her assessment vendor perspective. After defining assistive technology and noting the need to balance assistive technology with accessible educational materials, she clarified that there are two types of access tools. First, there are tools that are integrated and second, there are “third-party” tools. She asserted that both types are needed.

McSorley indicated that speech-to-text is a complex access system that has evolved over time. Voice Recognition (VR) is the technology behind speech-to-text. VR has improved dramatically since its inception in the 1950s. The VR technology in smart devices is relatively accurate for short commands, but accuracy diminishes as the length of dictation increases. She also noted that a variety of voice recognition software is available, but only one of them is fully controlled by voice only; most need a mouse.

McSorley raised numerous speech-to-text barriers for students with disabilities. These included cognitive, sensory, emotional, physical, and environmental barriers. She also noted one more barrier—policy requirements that impede access that could be provided by speech-to-text (e.g., requiring the student to spell every word, including indicating where there are spaces between words and where capitalization and punctuation are to be placed).

McSorley reinforced the importance of following international accessibility guidelines as the foundation of universal design. The Web Content Accessibility Guidelines (WCAG) are international guidelines that have recently been incorporated into the revised Section 508 statute of the United States Rehabilitation Act of 1973. She concluded her presentation by listing seven additional aspects of best practice:

- Conduct user studies with students with disabilities.
- Do quality assurance testing with assistive technology.
- Expose developers to subject matter experts.
- Expose developers to people with disabilities who are native users of assistive technology.
- Partner with assistive technology vendors.

- Stay abreast of the legal and technical landscapes (make no assumptions).
- Partner with platform and browser vendors to help them understand the needs of your students.

Assessment Consortium Perspective: Trish Klein, Smarter Balanced

Trish Klein started her description of speech-to-text from an assessment consortium perspective by reminding participants about the technology behind the speech-to-text resource. Although this technology started in the 1990s, and has dramatically improved since then, it still is not where it needs to be. She proposed that as the technology becomes more mainstream, advancements will move more quickly.

Klein highlighted the Smarter Balanced *Usability, Accessibility, and Accommodations Guidelines*, yet noted that the policies still can vary from state to state. The consortium has implemented a temporary approval process. She also stressed that the consortium's *Guidelines* include a description of the speech-to-text policy and provides specific recommendations for use (e.g., for students with motor or processing disabilities or students with a temporary disability). The recommendations include the requirement that the student is familiar with the software and has had many opportunities to use it in daily instruction.

Klein indicated that the consortium has been working on an AT readiness document to complement its *Technology Readiness* document. This guide, which will be available soon, addresses student preparation as well as assistive technology and information technology preparation.

Klein concluded her presentation by noting the importance of collaboration for ensuring the success of a student who uses speech-to-text. She also noted that there needs to be collaborative research by assistive technology vendors, assessment vendors, districts, and assessment consortia. This research could look at over- and under-use of the technology. It also could look at the effects of the technology for all students, not just those with IEPs or 504 plans. Klein also reported that there is current collaboration happening between assistive technology vendors, assessment vendors, and assessment consortia around web-based applications for speech-to-text and interoperability with secure browser testing environments.

Summary of Small Group Discussions

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

1. What are the implementation and policy challenges that need to be addressed?
2. How can states work with vendors to get speech-to-text systems that more smoothly interface with the test delivery system?
3. What research is needed for speech-to-text?

The group discussions are summarized here following the question format that was used for the discussion. The term “speech-to-text” is used in these notes to cover all voice recognition approaches.

Students in General Education

What are the implementation and policy challenges that need to be addressed?

The group had a rich discussion about implementation and policy challenges that need to be addressed. Specific implementation challenges mentioned included:

- With the increase in use of technology as a way of life, there is likely to be an increase in the use of speech-to-text with general education students.
- Speech-to-text is likely to be of benefit to general education students in many content areas (math, science, social studies), but teachers are saying they also use it in the classroom to teach language arts.
- How to operationalize the use of speech-to-text if it really is going to be for all students will be a significant implementation issue.
- Test security challenges are also likely to affect implementation.
- Thinking about speech-to-text should be different for instruction and for assessment. It might be very appropriate for instruction, but not for an assessment.
- Requesting and implementing speech-to-text is usually a very time consuming process; it should be made less cumbersome.

Participants in the group also identified several policy-related challenges. For example:

- When speech-to-text is used during an assessment, there is often a requirement that the student say capital letters, punctuation, etc., even when these conventions are not being scored. That does not make sense.
- It is very important to think about the construct the assessment is attempting to measure. If spelling is a part of what the assessment is measuring, then when using speech-to-text, spelling should be required.
- Policies are set up in different ways. For example, one state policy places speech-to-text under the heading of “scribe.” This almost suggests that scribe is the preferred approach. Is this appropriate?
- Should requirements for use of speech-to-text by general education students be different from what they are for students with disabilities?

How can states work with vendors to get speech-to-text systems that more smoothly interface with the test delivery system?

The group discussed a few issues that are related to states and vendors working to get speech-to-text systems that work more smoothly with the test delivery system. The following points were noted:

- All the players should sit down at the same table to collaborate.
- States and districts should indicate when there is a speech-to-text feature that they like so that the chances are increased that other vendors will create similar features.

- Clarity in terminology is needed. For example, the terms “speech recognition” and “voice recognition” should be distinguished from speech-to-text. Speech-to-text takes the input (voice recognition) and then outputs text.

What research is needed related to speech-to-text?

Participants in the group generated several ideas for research on speech-to-text:

- Study the skills students need to use speech-to-text.
- Conduct a study to obtain the student perspective on what is needed related to speech-to-text.
- Study how the three tiers of accessibility and accommodations support that are now available impact the student experience.
- Study the effect of the speech-to-text accommodation on the construct.
- Compare experiences and outcomes when a student uses a scribe versus when the student uses speech-to-text.

Students Who Are English Learners (ELs)

What are the implementation and policy challenges that need to be addressed?

Group participants had much to say about the implementation and policy challenges that need to be addressed for ELs and speech-to-text. Comments addressed implementation challenges for the general assessment and the assessment of English language proficiency (ELP):

- The speech-to-text device has to be able to use the student’s voice.
- Providing speech-to-text for an ELP assessment is different from providing it for the content assessment because of the constructs they measure. An ELP assessment measures writing in English, so speech to text that corrects English may not be appropriate.
- For the ELP assessment, instead of using speech-to-text, vendors are relying on voice recordings (for the speaking domain); this has its own challenges.

Participants also identified policy challenges. These included:

- Policies rely on a parochial definition of writing, which affects the use of speech-to-text.
- Sometimes, scribe is allowed even though there is no provision for speech-to-text because it is not real “writing.”
- Speech-to-text is available for ELs with disabilities, but then, because of vendor limitations, there is a need to go to a scribe.
- Policy should be to allow ELs to use their daily devices for the assessment.
- Policy should clearly define the construct so that it can then follow with (if appropriate) allowing speech-to-text.

How can states work with vendors to get speech-to-text systems that more smoothly interface with the test delivery system?

The group indicated several ways that states could work with vendors on speech-to-text systems. In addition, they spoke about what vendors needed to do. Some of the points made were:

- Vendors need to invest in upgrades to their speech-to-text systems.
- States should ask vendors for greater clarity on what will work with the test platform.
- Training a speech-to-text system for an EL is much more difficult than it is for other students due to accents. It would be great if vendors could figure out how to make this less difficult.

What research is needed related to speech-to-text?

Participants in the group generated several research ideas. There was some hesitation in identifying research ideas because of concerns that speech-to-text might not be best for ELs. Among the research ideas were:

- Explore how different speech-to-text systems work for speakers with accents due to their first language.
- Test out whether certain speech-to-text software works better for certain languages.

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 are the implementation and policy challenges that need to be addressed?

Participants in the two groups identified numerous challenges associated with speech-to-text that need to be addressed. These included:

- Who really needs speech-to-text is still ambiguous.
- Easy-to-use speech-to-text tools are available for classroom instruction, yet tend not to be used because they are not available on the assessment.
- Students who use speech-to-text need to be responsible for making sure that what they said is accurately reflected in the text produced.
- It is challenging to find time to practice speech-to-text as it will appear on the assessment.
- Speech-to-text software can include word prediction features; it is a problem if this feature cannot be turned off.
- There needs to be consideration of the integrity of instruction and whether it will be compromised by allowing the use of speech-to-text.
- A huge implementation issue is the sheer amount of time that it takes to prepare students to use speech-to-text.
- There are staffing issues associated with the use of speech-to-text for assessments; students often have to be tested one-on-one if they are using speech-to-text.
- Security continues to be an implementation issue.
- Small school districts may need extra support if they are to implement speech-to-text.

Among the policy-related comments that participants in the two groups addressing students who have IEPs or 504 plans were the following:

- Policy is defining the construct, but may be doing so in a way that disadvantages the real meaning of writing, which is so much more than putting words on paper. It should be about the ideas.
- Educators often confuse speech-to-text with text-to-speech. Policies should be explicit and provide definitions of terms.

How can states work with vendors to get speech-to-text systems that more smoothly interface with the test delivery system?

Participants made numerous comments on the topic of states working with vendors on the interface of speech-to-text with the test delivery system. Their comments included:

- States need to ensure that their assessment systems allow for the use of third-party software for speech-to-text.
- States should work with vendors to create profiles for those students who will use speech-to-text so that certain aspects of assistive technology cannot be used by the student during the assessment.
- States should work with vendors to create a glossary of terms related to speech-to-text (e.g., word prediction, predict ahead, voice recognition, etc.).
- Address what sometimes seems to be a conflict between assistive technology staff and information technology staff; this seems like a conflict between accessibility and security. This means communication is needed between states and vendors because assessment vendors tend to talk to information technology staff, not assistive technology staff.
- States need to share changing accessibility policies with vendors; this is sometimes done too late (or never), which means that the vendor cannot adjust the technology to match the policy.
- Collaboration among states and vendors is needed to provide the best speech-to-text for students.
- Figure out a way to pilot the use of software in a sample of districts of all sizes (to check bandwidth issues, testing concerns, etc.).

What research is needed related to speech-to-text?

Numerous ideas by the two groups addressing students with IEPs and 504 plans included:

- Gather data on how many students actually use speech-to-text.
- Conduct cognitive labs to help identify all the problems that emerge in the implementation of speech-to-text.
- Hold focus groups with teachers (or interview teachers) to obtain a deeper understanding of how they balance using speech-to-text and writing instruction.
- Study whether the cognitive load demands of speech-to-text change with the demands of the questions.
- Document the actual use of speech-to-text rather than requests for it.
- Compare implementation issues that arise for scribe versus for speech-to-text.
- Ask students about their experiences when using speech-to-text in the classroom and on assessments.
- Conduct research on the areas of need that are addressed by speech-to-text (e.g., legibility of handwriting, processing issues, voicing math, etc.).

Conclusion

The meeting closed with debriefs from each of the groups, and concluding remarks by 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.

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