Accessibility and Usability for the English Language Proficiency Assessments for California: A Cognitive Lab Study with Students Who Are Deaf or Hard of Hearing and Students Who Are Blind or Have Low Vision

Contract # CN150012

Prepared for the California Department of Education by Educational Testing Service

Presented June 4, 2020

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Executive Summary

The English Language Proficiency Assessments for California (ELPAC) is the required state test for English language proficiency (ELP) that is given to students whose primary language is other than English. The ELPAC is aligned with California's 2012 English Language Development Standards and assesses students' ELP skills in listening, speaking, reading, and writing. With the approval of the State Board of Education, the California Department of Education (CDE) began planning the transition of the current paper-based ELPAC to a computer-based assessment with the goal of enhancing the state's assessment system. The state has been implementing the statewide content-area assessments (English language arts/literacy, mathematics, and science) on computers since 2015. Transitioning the paper-based ELPAC to the computer-delivery format is anticipated to (a) create consistency with other California assessments by using the same online test delivery platform and (b) increase the range of available accessibility resources.

As part of the transition work, Educational Testing Service (ETS), conducted several development activities. In 2019, a usability study was conducted using cognitive lab methodology (ETS, 2019f). The findings from the study supported the initial transition from paper to computer delivery and identified evidence-based recommendations to enhance the transition. To build on the initial validity evidence for the computer-based ELPAC, the current study was designed to (1) provide opportunities for students and test examiners to interact with the test delivery system and accessibility resources (2) provide an opportunity to gather feedback to inform the test development, and (3) to provide validity evidence to support technical requirements for peer review. In this study, ETS investigated the usability and accessibility of the accommodated ELPAC task types on the student testing interface for students with low-incidence sensory disabilities (i.e., visual impairments including blindness or low vision, and hearing impairments including deafness or hard of hearing). The current study was conducted at the earliest stage of developing the braille and American Sign Language (ASL) video accommodations. Findings from this study were used to inform recommendations to enhance the usability and accessibility of the computer-based ELPAC for students who are blind or have low vision and students who are deaf or hard of hearing. This usability evidence enhances the validity argument for the computer-based ELPAC to reinforce claims of the skills measured in the assessment.

This validity evidence for English learners (ELs) who are blind or have low vision or ELs who are deaf or hard of hearing is critical to ensure that the computer-based ELPAC is measuring the target ELP construct. For ELs with disabilities taking the computer-based ELPAC, interference with measuring the ELP construct could be disability status, or the student's familiarity with computer delivery, the digital accessibility resources (e.g., refreshable braille, zoom, magnification, ASL videos), or accommodation familiarity (e.g., braille proficiency, ASL proficiency).

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To investigate this issue for ELs who are blind or have low vision and ELs who are deaf or hard of hearing, three main areas were investigated using cognitive lab methodology:

1. Students' usability of the testing platform and accommodated computer-based ELPAC items

2. Students' use of the digital accommodations and associated accessibility resources

3. Usability of test examiner materials (e.g., *Directions for Administration*)

Cognitive lab methodology was used to systematically investigate the usability and accessibility of the items, test examiner materials, and digital accommodations for students who are blind or have low vision or who are deaf or hard of hearing and are taking the initial or summative computer-based ELPAC. ETS observed one-on-one administrations with test examiners and students. In addition to disability status, additional sampling considerations included grade level and EL status. Specifically, non-ELs who are blind or have low vision or who were deaf or hard of hearing were also recruited to function as a control group in the study. The purpose of the control group was to determine if the usability experiences vary as a function of students' EL status. Additional sampling criteria included English language proficiency level, home language, accommodation familiarity, and being enrolled in U.S. schools fewer than 12 months prior to the study.

A total of 10 test examiners and 71 students participated in the study. Twenty-eight ELs and 43 non-ELs participated. Of those participants, 17 students were blind or had low vision, 54 students were deaf or hard of hearing. For more details on the participants, refer to [section 5](#). During the time of the study, schools faced closures caused by rolling blackouts and wildfires. As a result, five schools with students who are blind or have low vision withdrew from the research study, effectively reducing the sample of students who are blind or have low vision from 37 eligible students to 17 eligible students.

The first area of investigation focused on students' interaction with the computer-based ELPAC. Observation notes, ratings, and feedback from observers regarding the first area of investigation suggest that, overall, students were able to interact with the computer-based ELPAC with the assistance of the test examiner (assistance allowed through the Test Navigation Assistant [TNA] role, a new, non-embedded resource addition to the suite of computer-based ELPAC accessibility resources). Frequently, the test examiner was the students' teacher (e.g., teacher of students who are visually impaired [TVI] or teacher of students who are deaf [TOD]). Often, test examiners noted areas where students demonstrated that the directions and screen layout were generally clear, but the students still experienced difficulty due to their disability or accommodations. In these instances, test examiners were observed to provide direct instruction on how to navigate the platform and accommodation, specifically for the general instructions and the first task type for each domain of the test. Generally, students were observed to learn quickly how to interact independently on the platform as they progressed through the test. However, some students were observed to need additional assistance with using the accommodations, as proficiency in using the digital-based accommodations varied.

The second area of investigation focused on the students' use and usability of the accessibility resources for the computer-based ELPAC. Students were observed to use a range of accessibility resources depending on individual need and test examiner recommendations. The most commonly used resources for students who were deaf or hard of hearing included the ASL video and closed captioning accommodations. Streamline mode, zoom, magnification, text to speech, and print on demand combinations were more likely to be used by low vision students. Students using braille accommodations used refreshable braille and the associated complimentary resources for braille administrations such as, streamline mode, text to speech, keyboard navigation, print (emboss) on demand. The most commonly used resource across all student groups was the TNA role provided by the test examiner (for more on this role, refer to Section 6.2). Findings suggest that test examiners were aware of their students' needs and provided TNA even while some students may not have requested assistance.

Additional evidence suggested that students had varying levels of familiarity with the test accommodations and thus experienced some usability challenges finding and using the allowed accommodations (explained in more detail in Section 6.2). Test examiners who were also TODs or TVIs assisted students in using the accommodations but requested additional guidance to ensure that the assistance provided would be appropriate for a standardized assessment.

The third area of investigation focused on test examiners' use of and the usability of the administration materials, namely the *Directions for Administration* (*DFAs*). Findings from the study suggested that, generally, the test examiners found the *DFAs* clear and easy to use. Test examiners recommended additional changes that could better tailor the *DFAs* to help test examiners better meet students' wide range of needs. These recommendations included streamlined, standardized language that reflects the sensory needs of the students and written descriptions of the ASL videos so test examiners can clarify the directions without needing to rewatch videos.

Collectively, the evidence in this study suggests that while students were generally able to interact with the computer-based ELPAC training test, some students did experience usability and accessibility challenges. Accordingly, evidence-based recommendations include the following, grouped by the main area of investigation:

- Support students' interactions with the computer-based ELPAC:

  - **Review test materials from the user perspective—**Enhance accommodation reviews (e.g., at the authoring, delivery, and stakeholder level) by increasing the participation of the blind and low vision community and the deaf and hard of hearing community

  - **Enhance writing response areas—**Investigate improvements for the Writing domain constructed-response boxes in the braille test form to promote usability and accessibility for students using refreshable braille and keyboard navigation

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- Enhance accessibility resources on the computer-based ELPAC:

  - **Integrate zoom and magnification resources—**Investigate additional processes to reduce interaction effects and promote compatibility, usability, and accessibility for students needing to simultaneously use both zoom and magnification accessibility resources on every domain

  - **Make ASL and closed captioning resources easier to find—**Investigate solutions to improve access to the ASL video and closed-captioning accommodations that are consistent with the presentation of the existing accessibility resources

  - **Enhance braille access on iPads—**Make the braille test form accessible on the iPad

- Improve usability of test administration materials for the computer-based ELPAC:

  - **Improve *DFAs* for deaf or hard of hearing students—**Improve the *DFAs* to support test administrations for students who are deaf or hard of hearing

  - **Enhance braille *DFAs*—**Enhance the braille test form *DFAs* to support standardized initial test navigation instructions for students with who are blind or have low vision

  - **Enhance call center resources—**Enhance the call center experience for stakeholders reporting issues with accommodated test administrations and the accessibility resources

This report provides more detail about the study and its findings.

1. Background

The ELPAC is the required, state assessment to measure ELP for students in California. Designed to measure the California 2012 English Language Development Standards, the ELPAC is administered to students whose primary language is other than English. The ELPAC assesses ELP skills across four domains of Listening, Speaking, Reading, and Writing.

In November 2018, the State Board of Education (SBE) approved Amendment 6 of the California Assessment of Student Performance and Progress (CAASPP) contract. As part of the CAASPP contract, the ELPAC was approved to be transitioned from a paper-based test to computer-based delivery for students from kindergarten through grade twelve. Following the *Proposed High-Level Test Design for the Transition to Computer-based ELPAC* (Educational Testing Service, 2019g), ETS conducted the *Usability Pilot Utilizing Cognitive Lab Methodology* (henceforth, the Usability Pilot; ETS, 2019e) in April of 2019. Participants in the Usability Pilot included ELs, test examiners, and a small sample of ELs with high incidence disabilities and those who did not require specific accommodations (like ASL videos or braille). In fall 2019, during the window of the ELPAC field test and mode comparability study, the current study (the Accessibility Cognitive Labs for the Computer-based ELPAC; henceforth, the study) was conducted to gather information on the accommodated ELPAC test materials for students with visual impairment and students who are deaf or hard of hearing. This report describes the study design, findings, and recommendations to improve the accessibility of the computer-based ELPAC.

2. Study Purposes

The purposes of the cognitive lab study were as follows:

- To provide opportunities for participating ELs who are blind or have low vision and ELs who are deaf or hard of hearing and test examiners to explore and interact with the computer-based ELPAC accessibility resources prior to the operational administration

- To gather feedback to inform the ongoing development of the following:
  – Test delivery system
  – Item design
  – Accessibility resources design
  – *Directions for Administration* (*DFAs*)

- To provide validity evidence to support technical requirements for peer review

The goal of the study is to provide validity evidence to support the test-development process to enhance the accessibility and usability experience of the computer-based ELPAC. Specifically, the validity evidence collected in this study is focused on usability of the test for ELs who are blind or have low vision and ELs who are deaf or hard of hearing and test examiners compared to non-ELs who are blind or have low vision and non-ELs who are deaf or hard of hearing. The purpose of including the non-ELs who are blind or have low vision and non-ELs who are deaf or hard of hearing is to aid interpretations of students' experiences. That is, to determine whether the accessibility or usability challenges experienced would be due to students' disability rather than their language proficiency level. This study complements the previous studies that examined the usability of the computer-based ELPAC and additional mode comparability studies establishing necessary psychometric properties to validate the conversion from the paper-based ELPAC to the computer-based ELPAC. The evidence from the current study could be used to support federal peer review purposes (U.S. Department of Education, 2018). The three main areas of investigation are highlighted in the next section.

3. Areas of Investigation and Research Questions

This study focuses on the usability and accessibility of the computer-based ELPAC for ELs who are blind or have low vision and ELs who are deaf or hard of hearing. The study is designed to provide evidence to support students' interaction with the computer-based ELPAC, the use of the students' allowed accessibility resources, and the test examiner's interactions with the *DFAs*. The research questions for the study were the following:

3.1. Students' Interaction with the Computer-based ELPAC

1. How do students interact with the testing interface, the content, and the allowed accessibility resources for the computer-based ELPAC?

2. To what extent are the content and intended functionalities usable?

3.2. Accessibility Resources for English Learners with Disabilities Taking the Computer-based ELPAC

1. How do students use the accessibility resources to access the test? What difficulties, if any, do students experience?

2. To what extent do the accessibility resources support the access of ELs who are blind or have low vision to the content in the computer-based ELPAC?

3. To what extent do the accessibility resources support the access of ELs who are deaf or hard of hearing to the content in the computer-based ELPAC?

3.3. Usability of Test Administration Materials for the Computer-based ELPAC

1. How do test examiners use the administration materials (e.g., DFAs, setting up and interacting with designated supports or accessibility resources)?

2. To what extent is the information in the test examiner materials clear, particularly with regard to the administration of the computer-based ELPAC to ELs who are blind or have low vision or ELs who are deaf or hard of hearing? What difficulties, if any, do test examiners experience?

4. Development of Cognitive Lab Test Materials

The computer-based *ELPAC Training Tests* (ETS, 2019i) were used as the test materials in the current study. The training tests were the first ELPAC test materials to undergo accommodations reviews with internal experts at ETS and teachers of the visually impaired and to have accommodations (e.g., American Sign Language videos, braille forms) produced. Some task types were selected from the task types converted for the computer-based *ELPAC Usability Pilot Tests* (ETS, 2019f), while others were selected due to their representation of the technical skills students would need to gain familiarity with to interact with the computer-based ELPAC. These items were approved by the CDE to be administered as part of the training test.

4.1. Development of Training Test Forms

The *Specifications for Conversion of ELPAC Task Types for Computer-Based Delivery* (ETS, 2019h) document was designed to describe the process through which the items are converted from the paper–pencil presentation to the computer-based version.

Table 1 shows the number of unique ELPAC training test items by domain and grade or grade span that were converted to the computer-based format. All Listening and Reading items are multiple-choice (MC) items. Speaking and Writing items are constructed-response (CR) items. Note that TK refers to transitional kindergarten, which is defined as year one of a two-year kindergarten program; and K refers to kindergarten.

Table 1. Number of Unique Items to Be Converted to Computer-based Format by Domain and Grade or Grade Span

Domain (Item Type)	TK/K	1	2	3–5	6–8	9–10	11–12	Totals
Listening (MC)	4	1	4	3	7	3	4	26
Speaking (CR)	2	2	6	4	4	0	7	25
Reading (MC)	6	2	5	8	0	12	0	33
Writing (CR)	0	0	0	2	5	1	0	8
Totals	12	5	15	17	16	16	11	92

A training test form was developed for each grade level and grade span. Each training test form contained a sample of items across each of the four domains in the ELPAC: Listening, Speaking, Reading, and Writing. Some items were shared across grade levels or grade span training tests.

Table 2 shows the total number of items, including unique and shared items in parenthesis, across each grade level and grade span in the training test form.

Table 2. Total Number of Unique and Shared Items by Domain and Grade or Grade Span

Domain (Item Type)	TK/K	1	2	3–5	6–8	9–10	11–12	Total
Listening (MC)	4 (4, 0)	4 (1, 3)	4 (4, 0)	6 (3, 3)	7 (7, 0)	7 (3, 4)	7 (4, 3)	39
Speaking (CR)	9 (2, 7)	9 (2, 7)	10 (6, 4)	10 (4, 6)	11 (4, 7)	11 (0, 11)	11 (7, 4)	71
Reading (MC)	6 (6, 0)	5 (2, 3)	5 (5, 0)	8 (8, 0)	10 (0, 10)	12 (12, 0)	12 (0, 12)	58
Writing (CR)	N/A	N/A	N/A	5 (2, 3)	5 (5, 0)	5 (1, 4)	5 (0, 5)	20
Totals	19	18	19	29	33	35	35	188

Note: The numbers in parentheses indicate the number of unique and shared items, respectively. "N/A" stands for not applicable, because the Writing test was not administered on the computer for TK/K, grade one, and grade two. The Listening and Writing domain items included embedded audio files to read aloud item level information to the students. The Speaking items include embedded audio recording functionality to record the students' response.

Further details about the items shared across grades or grade spans are contained in *Training Test Items for the Computer-Based English Language Proficiency Assessments for California* (Educational Testing Service, 2019j). Test forms at each grade level and grade span included section directions and transition screens for administration. The general design of the ELPAC requires that the Listening, Speaking, Reading, and Writing test forms at TK/K, grade one, and grade two are administered in a one-on-one setting with a test examiner. The Listening, Reading, and Writing test forms for students in grades three through twelve were generally intended to be taken independently in a group setting. The Speaking domain tests at all grade levels and grade spans were intended to be administered one-on-one with a test examiner and student.

4.2. Accessibility Resources

The ELPAC training tests were made accessible through minimal adaptations and the use of accessibility resources. Select items in the training test braille forms were reviewed by TVIs in March 2019. TVIs were consulted to provide guidance on adaptations to make the content accessible for students using screen readers (e.g., Job Access With Speech [JAWS]). Where applicable, ETS worked with external vendors to create accessible formats used in this study (e.g., uncontracted and contracted Unified English Braille [UEB] transcripts, ASL videos) to make content accessible for students who are blind or have low vision or who are deaf or hard of hearing. External braille and ASL vendors had familiarity creating accessible formats for kindergarten through grade

twelve assessments, such as for the CAASPP. As with the existing contract work, external vendors were required to follow industry standards when creating accessible formats for the computer-based ELPAC.

A range of accessibility resources, such as those listed in the *English Language Proficiency Assessments for California Accessibility Resources for Operational Testing* (Educational Testing Service, 2019e) document were made available and were either embedded or non-embedded in the computer-based ELPAC platform. The accessibility resources for the computer-based ELPAC are based on a multitiered approach. Universal tools and designated supports are available for all students, and accommodations are available for few students with an IEP or Section 504 plan. Figure 1 shows a graphical representation of the different resources available for the computer-based ELPAC, including unlisted resources and domain exemption guidance.

Figure 1. 2019–20 California Student Assessment Accessibility for the Computer-Based English Language Proficiency Assessments for California

Students and test examiners participating in the study were able to select the accessibility resources needed for each domain level test. Some common resources for students who are blind or low vision include zoom and magnification for enlarging the text, screen reader, and a refreshable braille display was used to access the braille accommodation.
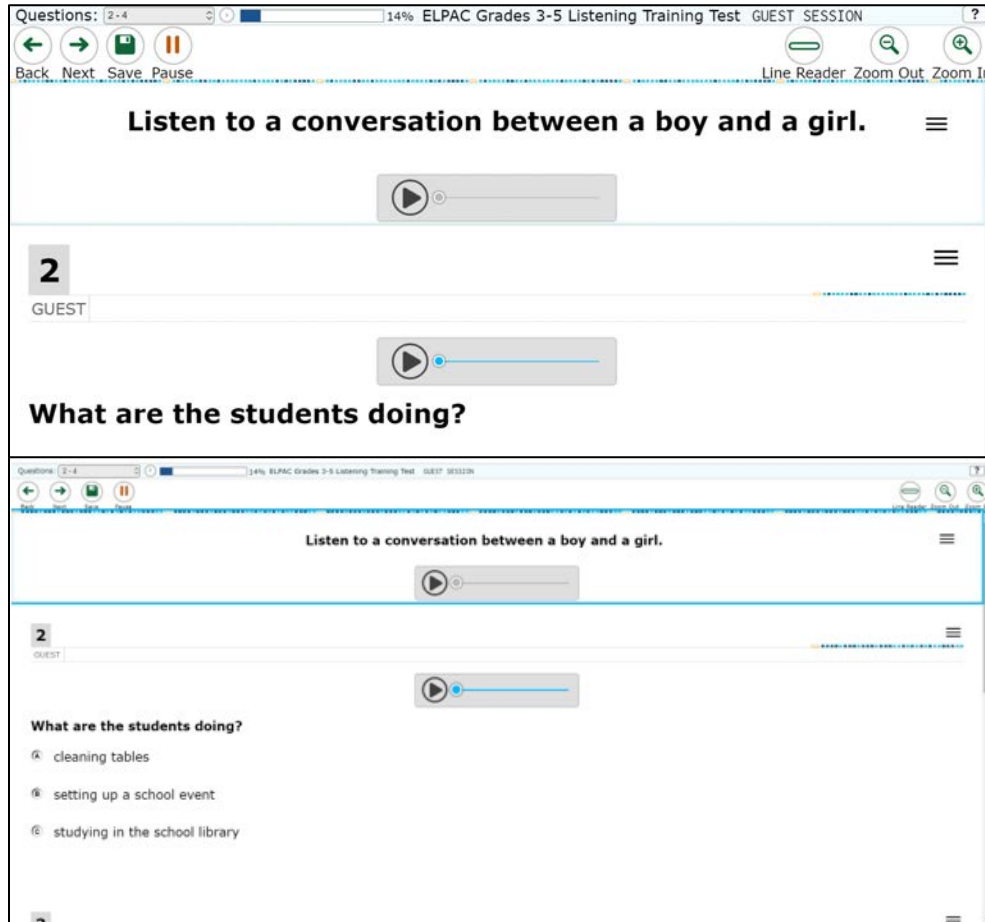
Figure 2. Screenshots of the *ELPAC Grades 3-5 Listening Training Test* for students using common accessibility resources for students who are blind or low vision

Figure 2 shows two common testing interface screenshots with various accommodations applied. The ELPAC grade span three through five Listening domain training test is used as an example. The top picture of figure 2 has the following test settings applied: braille presentation, streamline mode, zoom (default × 3), and permissive mode. The bottom picture of figure 2 has the following test settings applied: braille presentation, streamline mode, permissive mode, and an external screen reader is activated. The screen reader has a blue rectangular visual cue to orient a sighted user (e.g., test examiner) to where the screen reader is reading content aloud.

For students who are deaf or hard of hearing, some commonly used resources include closed captioning and ASL video accommodations.
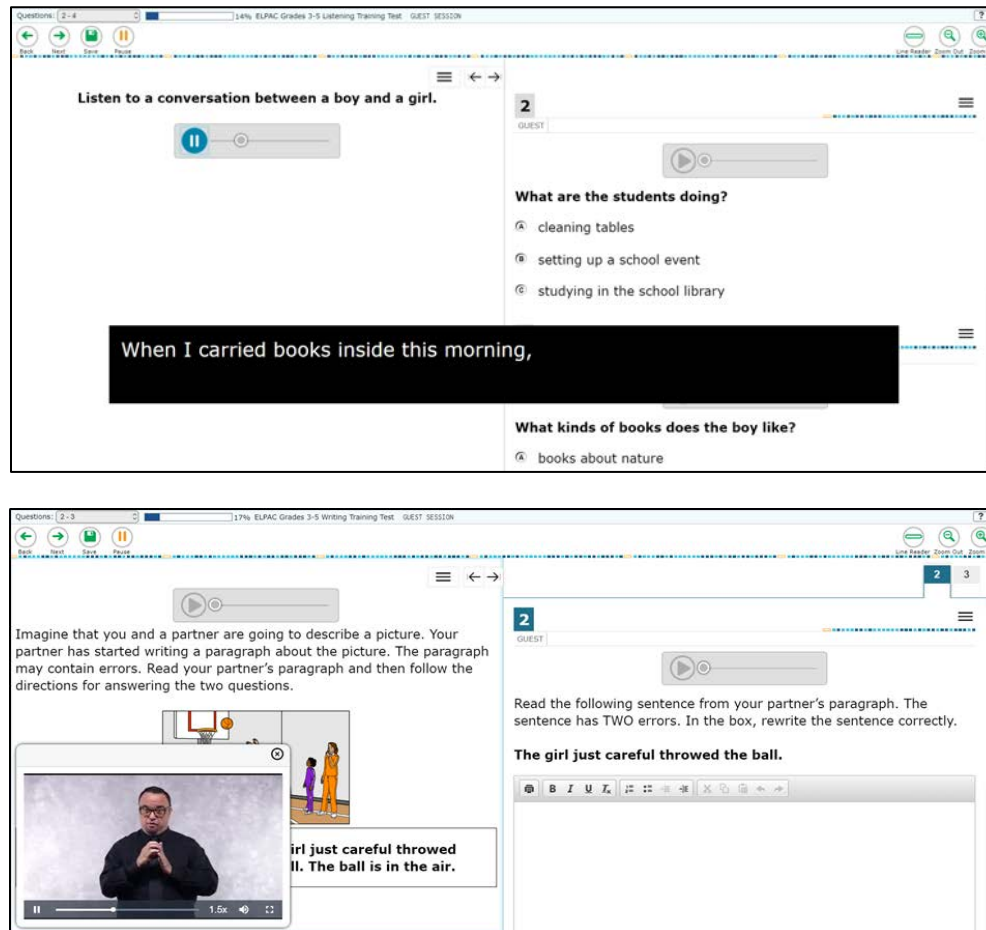
Figure 3. Screenshots of the ELPAC grade span three through five Listening (top) and Writing (bottom) training tests showing common accessibility resources for students who are deaf or hard of hearing

In figure 3, these accommodations are shown on the student interface. The top screenshot uses the example of an ELPAC grade span three through five Listening training test item to display the closed captioning test settings. The closed captioning is represented by the black rectangular box presented on the bottom portion of the screen. To activate the closed captioning, students selected the [**PLAY**] icon and the closed captioning appeared. In the bottom picture an ELPAC grade span three through five Writing training test item is used to display the ASL video test settings. The Writing item is used as an example to be sensitive to the study participants exercising domain exemptions for the Listening domain test. To activate the ASL video, students were required to select the [**CONTEXT MENU**] icon (the icon with three horizontal lines) and select the [**ASL VIDEO**] option from the menu. The ASL video defaults to the bottom left corner presentation as shown in figure 3. Students have the option to customize the presentation of the video, including dragging and moving the video around the screen, enlarging the video to full screen view, and speeding up the video playback.

As part of the available accessibility resources on the computer-based ELPAC, the print on demand feature is allowable as a designated support. Print on demand can be used

to print test content item by item (on demand) from the students' device so that the student can interact with a paper version of the content. For students who are blind or have low vision, the print on demand resource is especially critical. For students with low vision, printed content may be placed under an external magnification device to further magnify the content. For students who read braille, braille file and tactile graphics, which are raised line drawings, can be embossed using braille embossers fitting the test administration specifications (e.g., a Tiger Max Pro embosser).

Previous studies (ETS, 2019b) found that embossing on demand can pose a challenge for some schools given that embossers are not always available at the school level. Instead, embossers may be available at the local educational agency (LEA) level only. Pausing the test to emboss and then driving to the LEA office to collect embossed content was not feasible for the current study due to the limited time with each student. To mitigate these potential challenges for the current study, a braille form, including items and tactile graphics, for each grade level and grade span test was embossed by ETS and brought into the cognitive lab sessions. Additionally, items were printed in color and assembled into print-on-demand test books for students who were sighted and requested access to printed items during the cognitive lab session.

4.3. Development of Test Examiner Materials

To administer the computer-based ELPAC, *DFA*s were designed by ETS and the Sacramento County of Education (SCOE) and approved by the CDE. These *DFA*s were designed to correspond with the grade-level or grade-span training test form. Each *DFA* contained directions for test examiners on how to administer each domain-level test. For example, *DFAs* created for the training tests and posted on ELPAC.org included 27 unique versions. Specific to this study, 21 of the 27 versions were used for the cognitive labs (excluding the paper Writing test *DFAs* for the general and large print and braille administrations at TK/K, grade one, and grade two). The versions consisted of *DFAs* for the Listening and Reading domains (TK/K, grade one, and grade two), Speaking domain *DFAs* for each grade level and grade span including TK/K, grade one, grade two, grade span three through five, grade span six through eight, grade span nine and ten, and grade span eleven and twelve. Corresponding *DFAs* for test administrations of blind or low vision students were also included in the study at every grade level and grade span, except the addition of a Listening, Reading, and Writing *DFA* for blind and low vision students in grades three through twelve. These versions for blind and low vision students differed from the general versions due to the addition of alternative text (alt text) embedded in the *DFAs* to assist the test examiners in verbally describing pictures or other graphical information.

According to the training test design, the general *DFA*s were intended to be used for test examiners administering the computer-based ELPAC to students who were deaf or hard of hearing (i.e., Listening and Reading domain *DFAs* for TK/K, grade one, and grade two test administrations). The training test design included self-administration in a group setting for students in grades three through twelve.

Feedback from the test examiners participating in the study reported possibly having only one student at each of the upper grade levels, making a group administration

unlikely. Test examiners requested some version of the *DFAs* be available to support their test administration for students in grades three through twelve. Therefore, a separate research-version *DFA* was created based on the cover and front matter of the existing *DFAs* to meet the test examiner requests to better facilitate the directions for their single test administrations.

The *DFA*s were originally designed as PDF documents to be accessed online at the ELPAC website. To assist test examiners in preparing for the cognitive lab, ETS printed and brought copies of the *DFA*s into the cognitive lab sessions for the test examiners.

Test examiners were able to use additional materials to assist them with the use of the *DFAs* such as the *Computer-based ELPAC Online Test Administration Manual: 2019 Field Test Administration* (Educational Testing Service, 2019c) and the *Accessibility Guide for the California Assessment System* (Educational Testing Service, 2019a). Respectively, these documents were designed for staff who play a role in the administration of the ELPAC as a procedural and policy guide on how to administer the ELPAC for students who require accessibility resources (e.g., how to load and set up JAWS on the student testing device).

In case test examiners needed an interpreter or a teacher of the deaf and hard of hearing to assist with the administration of the computer-based ELPAC, *ELPAC American Sign Language Guidelines* (Educational Testing Service, 2019d) were also printed and taken to the testing site with the *DFAs*.

5. Methodology

Cognitive lab methodology was used to investigate the students' and test examiners' interactions with the computer-based ELPAC, specifically focusing on students who are blind or have low vision and students who are deaf or hard of hearing (i.e., low-incidence disabilities special populations; refer to California *Education Code,* Section 56026.5). The focus on low-incidence disabilities makes the cognitive lab methodology and purposeful sampling particularly useful for this study (Morse, 2010; Nielsen, 1994; Palinkas et al., 2015; Patton, 2002). Studies of test performance from students in low-incidence disability groups may include too few participants to be explored statistically through large-scale psychometric investigations. In effect, purposeful sampling is a constructive approach to gather empirical evidence (Beatty & Willis, 2007; Willis, 2005). Sample size recommendations for cognitive labs and usability testing range widely, from one to four students (Hix & Hartson, 1993, Nielsen, 1994, Willis, 2005), while some recommendations range from five to 15 students (Blair & Conrad, 2006; Peterson, Peterson, & Powell, 2017; Willis, 2005). As such, the individualization of the cognitive lab methodology is ideal to collect rich and detailed data from low-incidence disability groups (AERA, APA, & NCME, 2014; Johnstone, Bottsford-Miller, & Thompson, 2006; Wolf, Guzman-Orth, Wain, Still, & Winter, forthcoming).

One common practice used as part of the cognitive lab methodology is the think aloud process (Ericsson & Simon, 1993). However, students with disabilities often use multiple senses to simultaneously process information. For example, students who are blind or have low vision often use screen readers (JAWS) to access the content. Asking students to explain their thought process while listening to and navigating with JAWS would require students to listen and speak simultaneously, introducing unnecessary cognitive load. Consequently, the think aloud process was not used in this study. Instead of the think aloud process, retrospective questioning was used at the end of each domain to elicit feedback from the students (Almond et al., 2009; Russell & Kavanaugh, 2011).

5.1 Sampling and Recruitment

Statewide recruitment was a collaborative effort between ETS, the CDE, and SCOE, which was recruiting for the ELPAC field test at the same time and alerted field test participants to the cognitive lab specifically geared toward students who are blind or have low vision and students who are deaf or hard of hearing. In addition to the California State School for the Blind and the California State School for the Deaf (northern and southern California locations), students who are blind or have low vision or who are deaf or hard of hearing may be enrolled in public, private, and charter schools across the state. In an effort to ensure all eligible students had opportunity to participate in the study, participation invitations were sent out to the entire field. A recruitment survey was developed and launched to ELPAC test coordinators. Communication updates were launched to the ELPAC Listserv and the Braille-N-Teach list serv. The cognitive lab study recruitment efforts were also included as part of CDE presentations to the field, such as the Advisory Commission on Special Education.

Methodology

Through these recruitment efforts, local ELPAC test examiners, TVIs, and TODs were identified and invited to participate in the current study. ETS advised that the test examiner be familiar with the student and the student's skills with the allowable accommodations, including allowed assistive technology. Some test examiners acknowledged some concerns with having students who are deaf or hard of hearing participate in the Listening *and S*peaking domains. Test examiners were advised that the student's IEP should be followed. Additionally, test examiners were reassured that given the research study focus and Institutional Review Board (IRB) guidelines, if students were uncomfortable participating in either the Listening or Speaking domain the student would be able to exempt from the domain for the purposes of the current study. These decisions were made collectively with the student, teacher, and ETS observer. Participating LEA coordinators and test examiners were invited to join SCOE's ongoing trainings for the computer-based ELPAC field test. During the time of the trainings, some test examiners were not able to attend the local event due to wildfires happening through Southern California. In this instance, test examiners were given a one-on-one walkthrough of the computer-based ELPAC and corresponding *DFA* prior to beginning the test administration.

5.2 Participants

A total of 72 students were targeted to participate in the study. Primary sampling characteristics included disability group (visual impairments including blind or low vision, hearing impairments including deaf or hard of hearing) and EL status (EL or non-EL), and students must have been able to take the ELPAC on the computer. The goal of including non-ELs who were blind had low vision or were deaf or hard of hearing was to have a control group. The purpose of the control group was to help interpret the study findings to determine if the usability experiences were related to students' EL status, or if the usability experiences were consistent across EL status. Additionally, secondary characteristics were sampled where possible to further stratify the sample. Secondary characteristics such as home language, English proficiency level, recent arrival status, disability status, and accommodation familiarity were considered to introduce maximum variability in the small sample. However, once eligible students from low incidence disability groups agree to participate in the study, the resulting sample may not represent each these secondary characteristics. ETS oversampled, recruiting upwards of 90 eligible students, more than the recommended 72 students to participate in the study. The goal of oversampling was to ensure variation in the sample and provide safeguards if students were absent on the day of testing.

A total of 19 schools were recruited to participate in the study. However, due to the ongoing wildfires and rolling blackouts, five schools dropped from the study. Of the remaining 14 schools, a total of 71 students completed the cognitive lab testing and interviews.

The sample of 71 students consisted of both current ELs and non-ELs, as seen in table 3. Of the current ELs participating, none were recent arrivals (in the first 12 months of enrollment in U.S. schools). Overall, of the 71 students participating in the study, home languages included Spanish (37 percent), English (35 percent), Sign

Language (25 percent), Cantonese (1 percent), and Toishanese (1 percent). EL students' home languages included Spanish, Cantonese, and Toishanese.

Table 3. Number of Participating Students by Grade Level and Grade-Span and EL Status

Status	TK/K	Grade 1	Grade 2	Grade Span 3–5	Grade Span 6–8	Grade Span 9–12	Total
ELs	1	2	0	8	4	13	28
Non-ELs	4	7	3	14	8	7	43
Total	5	9	3	22	12	20	71

Note: The target sample of ELs and non-ELs was 36 students in each category, for a total of 72 participants.

Table 4 shows the number of students by EL student group and disability student group. Overall, because five schools dropped from the study due to the extenuating circumstances, the majority of the sample consisted of students who were deaf or hard of hearing (n = 54) and the remaining students were blind or had low vision (n = 17).

Table 4. Participating Students by EL Status and Primary Disability Category

EL Status	Primary Disability	Participants
EL	BLV	11
EL	DHH	17
Non-EL	BLV	6
Non-EL	DHH	37

Note: BLV = Blind or low vision. DHH = Deaf or hard of hearing.

Six students also had multiple disabilities; where they had a primary disability of deaf or hard of hearing or blind or low vision and a secondary (or multiple) disabilities. These additional disabilities included: Other Health Impairment, Autism Spectrum Disorder, Specific Learning Disability, and combinations of hard of hearing and low vision.

Students' accommodations ranged widely. Data from students' background questionnaires suggested that some common accommodations and assistive technologies for deaf or hard of hearing students included FM system, amplification, closed captions, hearing aids, cochlear implants, American Sign Language, and captioning. Some common accommodations and assistive technologies for students who were blind or had low vision included any combinations of large print, magnification, color contrast, screen readers, braille, alternate response options (refreshable braille display), permissive mode, turning off universal tools, streamline, and assistive devices for near or distant magnification. Additional accommodations captured in the students' background questionnaires included visual concentration assistance tools (e.g., large colored mouse pointers), simplified test directions, read aloud, speech to text, dictation, noise buffers, separate setting, and testing during a

beneficial time of the day. Accommodations not relevant for the computer-based ELPAC (e.g., science charts) were excluded from these lists.

Along with the students participating in the study, local ELPAC test examiners or teachers also participated. Henceforth, these test examiners and teachers will collectively be referred to as "test examiners."

Ten test examiners participated in the study. As noted, some of test examiners were teachers (n=4) or assessment coordinators (n=2). Others listed additional roles such as curriculum and outcome specialist (n=1), deaf or hard of hearing educational specialist (n=1), and student outcome teacher specialist (n=1), and multiple roles such as a teacher, assessment coordinator, and EL support personnel (n=1). Some test examiners had experience administering the California English Language Development Test. One test examiner had participated in the ELPAC Usability Pilot (ETS, 2019f). Of the participating test examiners, all ten administered the TK/K, grade one, grade two, grade span three through five test forms. Six of the ten test examiners administered the grade span six through eight, nine and ten, or eleven and twelve test forms, respectively. Three of the test examiners did not know ASL but administered the test to a student needing an ASL accommodation (following their local ELPAC delivery model). In these instances, an ASL interpreter was also present to assist the test examiner in the administration. During all test administrations for students who were deaf or hard of hearing and required an ASL accommodation, ETS also brought in a separate ASL interpreter to interpret the conversation for the ETS observer.

5.3. Study Instruments

Study instruments were designed by ETS and reviewed and approved by the CDE. An overview of the study instruments is presented in each of next sections.

5.3.1. Student Background Questionnaire

The student background questionnaire was designed to collect information about the students participating in the study. The topics surveyed in the questionnaire were designed to elicit more information about the students' EL and disability status. Sample topics included information such as the students' age, length of stay in the U.S., recent arrival status, country of origin, and home language as well as students' disabilities, accommodations, and accommodation familiarity. The questionnaire was designed to be completed by a person most familiar with the student (e.g., the classroom teacher).

5.3.2. Cognitive Interview and Observation Protocol Including a Rating Form

An observation protocol and rating form was developed for ETS observers to standardize the information that was being collected in the field. The interview and domain-level retrospective questions were designed to be administered by the test examiner as part of the test administration procedures. Based on feedback from the test examiners in the ELPAC Usability Pilot study, the ETS observer's role was to listen, observe, and record responses and information about the student and test examiner's interactions with the test, so that the test examiner could focus on the student and test

administration (ETS, 2019f). Test examiners were given permission to clarify wording for the students when necessary during the interview and retrospective questions. A rating form was designed to accompany the observation component of the ETS observers' protocol. The rating form consisted of two parts: student observation and test examiner observation. Each observation was designed to survey key variables of interest, such as interaction with the test content or materials (e.g., *DFAs*), observed clarity of the directions for the item, and the *DFAs*. A Likert scale (e.g., entirely, partially, not at all) was used to systematically evaluate the extent of the usability and accessibility of the computer-based ELPAC and *DFAs*. In addition to the Likert scale, observers were also able to record notes to add detail to the ratings.

5.3.3. Test Examiner Interview Protocol

Information was collected from test examiners through an interview protocol. After the test examiners' testing sessions, an interview protocol was administered to gather overall feedback from the computer-based ELPAC test administrations. The interview was designed to begin with demographic questions and then progress to detailed test administration questions covering the domains, directions, items, accommodations, and *DFAs.* If a TOD, TVI, or ASL interpreter supported the test examiner, the interview was adapted to include the collective feedback of those who administered the test to the student.

5.4. Procedure

Prior to conducting the study, the study instruments were reviewed and approved by ETS' internal IRB, also known as the Committee for Prior Review of Research. IRB approval is necessary to protect the rights of human subjects involved in the study and ensures that the research design is appropriate and that the research study will not cause harm to any participants. Additionally, test examiners were verified school- or LEA-level employees who have had appropriate fingerprinting and background clearance to work with students at school sites. ETS observers and external ASL interpreters obtained appropriate security clearance through ETS' *Working with Minors Policy* (Educational Testing Service, 2019j) to work with students at the school sites.

5.4.1. Before Data Collection

During the month of October, prior to conducting the study, SCOE was hosting trainings across the state to train test examiners on how to administer the computer-based Summative ELPAC. Test examiners participating in the study were required to attend one training. LEAs used different models for test administration, and some LEAs employed a district-level trainer who then trained the person who administered the computer-based ELPAC for the study. As noted previously, ETS observers also previewed the test administration procedures and materials prior to the test administrations to support test examiners who were unable to attend the SCOE trainings due to the wildfires.

At the same time, ETS observers were trained to observe cognitive labs at the school sites. Observers participated in four sessions for a total of 10 hours of training. Training sessions covered cognitive lab methodology, observation protocol and interview

techniques, techniques for students who are blind or have low vision, and techniques for students who are deaf or hard of hearing. During the sessions, the training test and *DFAs* were reviewed in depth, and items were tested using the appropriate assistive technology to train and calibrate observers' ratings prior to the data collection efforts.

The majority of the cognitive lab data collection was conducted during the fall, between October 21 and October 30, 2019. Individual follow-up testing was conducted with specific schools and students to fill the sampling matrix.

5.4.2. During Data Collection

During the data collection, ETS observers visited 14 different school sites across California. LEA and school liaisons were identified, and all logistics were coordinated with the individual liaison for each site. Each liaison oversaw the test examiner and student recruitment process at the school site, as well as the distribution and collection of consent forms and securing a quiet testing space and the necessary technology (including assistive technology). Each cognitive lab session was conducted one-on-one with a test examiner and student, with an ETS observer present. For ASL administrations, an ASL interpreter was also present to assist the ETS observer in following the test administration. Test examiners could skip domains in accordance with students' IEPs, or in response to student requests.

To begin each testing session, the test examiner first explained the cognitive lab, the goal of the cognitive lab, and the observer's role. Following the structure of the cognitive lab protocol, the test examiner then asked the student some background questions and the observer recorded all responses. Next, the test examiner transitioned to the first domain in the computer-based ELPAC training test. Following the test administration of each domain, test examiners asked the retrospective interview questions. After the last domain was administered, a set of final retrospective questions was asked. In the instances where ASL interpreters were used, ASL interpreters voiced all signed communication for the observer. When ASL was not needed, test examiners spoke in English for all student interviews. Prior to the study, test examiners confirmed the students (ELs or non-ELs) would not need translation assistance. During the study, translation assistance was available, but not requested. Students confirmed they did not need to speak in their home language and that they would speak in English. After the test examiner had completed testing the students, the test examiner was interviewed by the ETS observer. Testing sessions lasted approximately 30 minutes for students in kindergarten through grade two and 90 minutes for students in grades three through twelve, with approximately 30 additional minutes for each test examiner interview.

5.5. Data Analysis

Multiple data sources were collected through the study. Data included students' background information, observations, ratings, and interview notes, as well as test examiner interview notes. Student responses were not scored during this study given the focus on usability and accessibility. For instance, when usability challenges were discovered, they typically prohibited the students from independently interacting with the test and demonstrating English language proficiency without construct irrelevant

variance. As such, items were not scored and some items had to be skipped due to usability and timing considerations.

Some students' IEPs required that students be allowed to exempt from certain test domains based on their disability. For the purposes of the data analysis, the missing data and domain exemptions were treated similarly, as missing in the data set. ETS compiled the data into an Excel spreadsheet to organize and clean the data. The quantitative data was analyzed by each grade level and domain to obtain descriptive statistics by EL status, disability status, and overall (EL and disability status). The data shared in section 6 is from the aggregate analysis. Reporting data in the aggregate is important to minimize the risk of identifying information from students with low incidence disabilities. Descriptive tables of the disaggregated data at the student group level are available in appendix A, appendix B, and appendix C. Values in the data tables that were derived to be less than one but greater than zero were indicated with < 1 in the report to maintain transparency in the data.

The qualitative data such as the observation notes, interview notes, and comments was examined to identify themes related to the usability and accessibility of the computer-based ELPAC. This data was also examined by EL and disability status. Largely, the qualitative data in the report was also shared in the aggregate, with anecdotal and observation information to support findings at the disability or EL level when warranted by the obtained evidence. Care was taken to ensure identifying information from students was removed from any of these examples.

Specific closed and open coding categories were used across the student and test examiner qualitative data sources, consistent with a grounded theory approach (Charmaz, 2002; Glaser, 1965; Miles & Huberman, 1994). The data was qualitatively coded with the closed codes, corresponding with the a priori categories in the ETS observers' observation and rating protocol. The closed codes consisted of examples like *clarity of directions, clarity of test layout, test navigation assistance, student independence,* and *assistive technology.* Open codes were developed to code qualitative data that did not fit the a priori codes. Examples of open codes that emerged in the data included *community status [belonging, allies]; community type [blind and low vision; deaf and hard of hearing]; and technology [innovations, limitations].* Often, the qualitative data was coded with multiple codes. Coding was led by the Principal Investigator of the study and corroborated as a group for accuracy and clarity in interpretation with the cross-functional team of ETS observers who were in the field. This iterative process was conducted until 100 percent agreement was reached.

6. Findings

This section presents the study findings. The findings are organized according to the three main areas of investigation. Data sources analyzed in this section include both the Likert rating scale data and the field notes from the observations and interviews. The quantitative and qualitative data are shared to provide evidence. As mentioned previously, students experienced usability and timing challenges that mostly impacted the students' ability to complete all four domains of the computer-based ELPAC. This, in addition to the students whose IEPs required an exemption from specific domains on the ELPAC, resulted in missingness in the data set. Twenty-five students who were deaf or hard of hearing exempted from both the Listening and the Speaking domains. Specifically, these domain exemptions included two students taking the TK/K test form; six students taking the grade one test form; three students taking the grade two test form; four students taking the grade span three through five test form; four students taking the grade span six through eight test form; three students taking the grade span nine and ten test form; and three students taking the grade span eleven and twelve test form. Where relevant, these are indicated as "N/A" or not applicable in the following tables. As a result, the total number of students that completed each domain may vary across each table in this section and in the total observed students data from table 2 and table 3. All statistical data is reported in the aggregate in section 6. Disaggregated data by student group is presented in appendix A, appendix B, and appendix C. Because of the small n-counts in the disaggregated tables in the appendices, ETS recommends interpreting the disaggregated data with caution. Due to rounding of the weighted means, all percentages may not add to 100. The frequency or percentage may equal to less than one but more than zero and is represented with < 1 for transparency. Cases are labeled with zero in the tables where applicable.

6.1. Students' Interaction with the Computer-based ELPAC

The first area of investigation focused on students' interactions with the testing platform for the computer-based Summative ELPAC. Research questions for this area of investigation focused on students' interaction with the platform for the computer-based ELPAC as well as the accessibility resources. The next sections detail key variables of interest to evaluate students' use of and the usability of the computer-based Summative ELPAC.

6.1.1. Understanding Directions

Observers were tasked with rating the extent to which students understood the directions for each domain test and task type on the Training Test. Table 5 through table 8 illustrate the average ratings for students taking each grade level or grade span test form across the Listening, Speaking, Reading, and Writing domains. For corresponding student group analysis, refer to table A.1 through table A.3 for EL student groups; table B.1 through table B.3 for EL status by disability student groups; and table C.1 through table C.3 for non-EL by disability student group in appendix A, appendix B, and appendix C, respectively.

Table 5 shows students' understanding of the directions in each grade level or grade span as recorded by ETS observers. Corresponding student group information is shown in table A.1, table B.1, and table C.1.

Table 5. Listening Domain Understanding Directions: Frequency and Percentage of Students Observed in Each Rating Category

Grade or Grade Span	Not at All	Partially	Entirely
TK/K	0 (0)	0 (0)	4 (100)
Grade 1	1 (50)	1 (25)	1 (25)
Grade 2	N/A	N/A	N/A
Grade span 3–5	1 (3)	3 (16)	15 (81)
Grade span 6–8	0 (0)	2 (21)	6 (79)
Grade span 9–12	0 (0)	4 (29)	11 (71)

Overall, ratings in table 5 suggest that students taking the grade one test form had more difficulty since only 25 percent of the students were observed to understand the directions entirely compared to 71 percent to 100 percent of the students in the other grade levels and grade spans. Examining the data across student groups, non-EL students (50 to 100 percent) were observed to understand the directions in the Listening domain slightly more so than their EL peers (0 to 100 percent) as detailed in table A.1. The two students who did not understand the directions in the Listening domain were ELs (table A.1). The EL student in grade one had a primary disability of deaf or hard of hearing took the general test form, while the EL student in grade span three through five had a primary disability of blind or low vision and took the Listening domain on the braille test form (table B.1). The students in grade two were exempt from the Listening domain and were not included in this analysis. However, feedback from the test examiners indicated that there was an issue with the ASL videos in the grade one training test form which resulted in additional confusion for the students taking the test who had an ASL accommodation and did not have an exemption from an IEP. Across student groups and the other grade-level and grade-span administrations, students were observed to have some challenges with the directions for the first task type but were able to demonstrate they learned as they progressed through the task types and onto the next item.

Findings

Table 6 shows the extent to which students understood the directions on the Reading domain test. Corresponding table A.2, table B.2, and table C.2 show the disaggregated data for EL status and disability.

Table 6. Reading Domain Understanding Directions: Frequency and Percentage of Students Observed in Each Rating Category

Grade or Grade Span	Not at All	Partially	Entirely
TK/K	0 (0)	1 (17)	5 (83)
Grade 1	1 (17)	2 (22)	5 (61)
Grade 2	0 (0)	0 (0)	3 (100)
Grade span 3–5	1 (4)	4 (21)	14 (75)
Grade span 6–8	0 (0)	0 (0)	5 (100)
Grade span 9–12	0 (0)	2 (12)	14 (88)

Overall, the data in table 6 suggests that students mostly understood the directions, with values for students who entirely understood the directions ranging from 61 to 100 percent across the grade level and grade span tests. Some students partially understood the directions (ranging from 0 to 22 percent of the students taking each grade level and grade span test). Examining table A.2 and table B.2 for student group differences, the participant count suggests that more non-EL students understood the directions for the Reading domain compared to EL students, however, the direct comparison across EL status should be interpreted with caution. It is imperative to note that the non-EL sample size is larger, especially given the students who were deaf or hard of hearing did not exempt from the Reading domain. As such, comparison of the relative percentages suggest that minimal group differences were noted across EL status, with slight differences in the earlier grades (table A.2). Table A.2 shows 0 to 100 percent of EL students understood the directions compared to 73 to 100 percent of non-EL students. Two EL students—one in grade one taking the general test form and one taking the grade span three through five braille test form (table B.2)—had some difficulty with the clarity of the directions. EL students who were deaf or hard of hearing and did not entirely understand the directions required the test examiner to resign the directions for clarity. For students who were blind or had low vision, data suggested the bold text for the directions was not immediately discernable for the students with low vision. Similarly, for students using refreshable braille, the Unified English Braille indicators for bold text were not discernable.

Table 7 shows the data for the Writing domain. Table A.3, table B.3, and table C.3 show the disaggregation by EL status and disability.

Table 7. Writing Domain Understanding Directions: Frequency and Percentage of Students Observed in Each Rating Category

Grade or Grade Span	Not at All	Partially	Entirely
Grade span 3–5	7 (33)	6 (28)	8 (38)
Grade span 6–8	0 (0)	4 (44)	5 (56)
Grade span 9–12	2 (9)	4 (24)	11 (67)

The Writing domain was only administered to students on the computer who were taking the grade span three through five, six through eight, or nine through twelve tests. The Writing domain for students taking the TK/K, grade one, or grade two tests was administered on paper and thus was not investigated as part of this study. Of the students taking the computer-based Writing domain test, students had some challenges understanding the domain and task-level directions across each grade span as shown in table 7; students who entirely understood the directions ranged from 38 percent to 67 percent. Examining the disaggregated data, table A.3 shows that the challenges observed in table 7 were also observed across both ELs (33 to 75 percent) and non-ELs (0 to 100 percent) across disability student groups (table B.3 and table C.3).

Specifically, some students were confused with the text written on the screen and the availability of the audio file (or ASL video). Across grade span tests, students were unsure whether to listen to the audio file (or watch the ASL video) and then read the text or read the text and then listen (or watch the ASL video), or if it was permissible to choose a preferred means of access. Additionally, some students reported that the signing in the ASL videos was also unclear and thus students needed the test examiner to clarify the domain and task level directions (e.g., Writing Describe a Picture task type).

Table 8 shows how many students understood the directions for the Speaking domain. Disaggregated data by EL status and disability category are shown in table A.4, table B.4, and table C.4.

Table 8. Speaking Domain Understanding Directions: Frequency and Percentage of Students Observed in Each Rating Category

Grade or Grade Span	Not at All	Partially	Entirely
TK/K	0 (0)	< 1 (8)	4 (92)
Grade 1	0 (0)	1 (25)	2 (75)
Grade 2	N/A	N/A	N/A
Grade span 3–5	< 1 (2)	1 (8)	15 (91)
Grade span 6–8	0 (0)	0 (0)	8 (100)
Grade span 9–12	1 (7)	1 (9)	10 (84)

Findings

The students in grade two were exempt from the Speaking domain and were not included in this analysis. Of the students who were not exempt from the Speaking domain test, the data suggests that most students entirely understood the directions (ranging from 75 percent to 100 percent). The data in table A.4 suggests minimal differences due to EL status, with one EL student taking the grade span nine through twelve test who did not understand the directions in the Speaking domain, while the remaining EL students were observed to entirely understand the directions in the Speaking domain. Some students reported challenges understanding the directions at the task type level (e.g., Talk About a Scene; Summarize an Academic Presentation) due to unfamiliarity with the context in the task type or challenges with administrability due to simultaneously processing the task type presentation and interacting with the accommodations.

6.1.2. Navigating the Platform and Items Independently

Observers were tasked with rating the extent to which students were able to independently navigate the computer-based ELPAC including the platform and the items. Along with navigating the platform's layout, students were also required to enter responses into the testing platform. Generally, 66 to 100 percent of students taking the Listening domain, 86 percent of students taking the Reading domain, and 69 to 88 percent of students taking the Writing domain understood how to navigate the test layout. Some students demonstrated some challenges with the layout of the grade span three through five Listening domain and the Writing domain (66 percent and 69 percent, respectively). For context, the split screen layout of the domain was similarly experienced by students who were deaf or hard of hearing. Students who were blind or low vision experienced a streamline (horizontal presentation mode) layout for their grade span tests. The ratings summarizing the extent to which the students were independently navigating the platform and entering responses are shown in table 9 through table 12.

Table 9 shows this information for the Listening domain, with disaggregated data shown in table A.5, table B.5, and table C.5.

Table 9. Understanding Layout of the Listening Domain: Frequency and Percentage of Students Observed in Each Rating Category

Grade or Grade Span	Not at All	Partially	Entirely
Grade span 3–5	1 (6)	5 (28)	12 (66)
Grade span 6–8	0 (0)	0 (0)	8 (100)
Grade span 9–12	1 (4)	2 (11)	13 (86)

The data in table 9 excludes TK/K, grade one, and grade two due to the test examiner directing the student through the layout of the test. Specific to students in grade spans three through twelve, the data in table 9 suggests that the Listening domain layout was relatively easy to navigate, although students taking the grade span three through five test form seemed to experience some challenges compared to students navigating the Listening domain on the grade span six through eight and grade span nine through

twelve test forms (66 percent, compared to 100 percent and 86 percent respectively). Disaggregated data in table A.5 suggests slight group differences may exist between EL and non-EL students, where slightly more EL students were observed to understand layout either "partially" or "not at all" compared to the non-EL students. Taking into account disability, EL students who were blind or had low vision were observed to experience more difficulty understanding the layout (table B.5) as did their non-EL peers who were deaf or hard of hearing (table C.5). Findings suggest that both students using the ASL video accommodation and students using the screen reader (e.g., JAWS) had challenges navigating the embedded audio files. For example, students needing the ASL accommodation often selected the audio file [**PLAY**] icon to activate the ASL video, when instead the students should have selected the [**CONTEXT MENU**] icon to find the ASL video. For screen reader users, JAWS was observed to read aloud the text on the screen simultaneously with the audio file activation.

Table 10 suggests that students were mostly independent when taking the Reading domain. Table A.6, table B.6, and table C.6 show the disaggregated data for the Reading domain layout.

Table 10. Understanding Layout of the Reading Domain: Frequency and Percentage of Students Observed in Each Rating Category

Grade or Grade Span	Not at All	Partially	Entirely
Grade span 3–5	1 (4)	2 (11)	15 (86)
Grade span 6–8	0 (0)	1 (14)	4 (86)
Grade span 9–12	0 (0)	2 (12)	14 (88)

Ratings of students being entirely able to navigate the platform independently ranged from 86 to 88 percent across the grade span test forms (table 10). In table A.6, minimal differences are observed due to EL status. Generally, students were rated to understand the layout almost entirely, ranging from approximately 75 to 100 percent, with the exception of one EL student who did not understand the grade span three through five braille test form layout (table B.6). The few students who experienced some challenges with the navigation mostly had issues regarding the accommodations. Students who were deaf were observed to search on the screen for the ASL video to sign the passage. Students who were blind or had low vision were observed to try various keyboard commands to activate JAWS to read the reading passage. Students with low vision that needed both zoom and magnification experienced navigation challenges when the [**NEXT**] icon in the toolbar visually "disappeared" due to the enlarged content, and the keyboard navigation commands would not activate the icons to visually progress the test on the student interface.

Findings

Data in table 11 suggests that across all grade span tests, 69 to 88 percent of students understood the Writing domain layout. Students taking the grade span three through five and grade span nine through twelve test forms seemed to experience more challenges (69 percent and 75 percent respectively) compared to 88 percent of students navigating the Writing domain independently on the grade span six through eight test form. Examining data from table A.7, slight differences are observed across EL status, with EL students observed as entirely understanding the Writing domain layout (ranging from 62 to 76 percent) compared to non-EL students entirely understanding the layout (ranging from 73 to 92 percent). Examining across disability, only 50 percent of EL students who were blind or had low vision were observed to entirely understand the layout, compared to 75 to 100 percent of non-EL students who were deaf or hard of hearing (table B.7). Similar patterns are observed in table C.7, where only 33 percent of non-ELs who were blind or had low vision were observed to entirely understand layout, compared to 76 to 92 percent of non-ELs who were deaf or hard of hearing. Observational data suggests that students who are blind or had low vision and used a braille accommodation (which includes streamline mode [vertical layout], text to speech, and keyboard navigation) experienced challenges navigating the content, ultimately requiring the test examiner to take over the navigation in some instances.

Table 11. Understanding Layout of the Writing Domain: Frequency and Percentage of Students Observed in Each Rating Category

Grade or Grade Span	Not at All	Partially	Entirely
Grade span 3–5	5 (23)	2 (8)	15 (69)
Grade span 6–8	1 (13)	0 (0)	7 (88)
Grade span 9–12	1 (3)	4 (22)	13 (75)

Data from table 12 summarizes the extent to which students were able to independently enter responses into the student interface. Corresponding disaggregated data is shown in table A.8, table B.8, and table C.8.

Table 12. Students Answering Independently: Frequency and Percentage of Students Observed in Each Rating Category

Domain	Grade or Grade Span	Not at All	Partially	Entirely
Listening	Grade span 3–5	1 (6)	2 (9)	15 (84)
Listening	Grade span 6–8	0 (0)	1 (7)	7 (93)
Listening	Grade span 9–12	0 (0)	3 (21)	12 (79)
Reading	Grade span 3–5	1 (7)	1 (3)	16 (90)
Reading	Grade span 6–8	1 (14)	0 (0)	4 (86)
Reading	Grade span 9–12	0 (0)	1 (8)	15 (92)
Writing	Grade span 3–5	1 (5)	3 (15)	17 (79)
Writing	Grade span 6–8	1 (13)	0 (0)	7(88)
Writing	Grade span 9–12	1 (6)	2 (12)	14 (82)
Speaking	Grade span 3–5	3 (17)	1 (3)	14 (80)
Speaking	Grade span 6–8	3 (32)	2 (25)	3 (43)
Speaking	Grade span 9–12	5 (44)	1 (9)	6 (47)

Findings suggest that across grade spans students were mostly able to entirely answer or enter responses independently on the Listening domain (ranging from 79 to 84 percent), Reading domain (86 to 92 percent), and Writing domain (79 to 88 percent). In contrast, data summarizing the Speaking domain ratings suggests that students had some challenges being able to answer independently. Unpacking the data by EL status, ratings for students able to answer entirely independently were slightly higher for EL students compared to non-EL students taking the Listening and Reading domains, but then drop slightly for the Writing and Speaking domains (table A.8). The decrease in independence is observed across both EL and non-EL groups. In table B.8, EL students who were blind or had low vision and were observed to be entirely independent while taking the Writing domain ranged from 33 to 90 percent, compared to students who were deaf or hard of hearing ranging from 75 to 100 percent. At this level, grade-level patterns also emerged with EL students in grade span three through five performing lower than the other grade spans for EL students who were blind or had low vision. Similarly, in table C.8, non-EL students who were blind or had low vision were observed to have more difficulties answering independently compared to their non-EL peers who were deaf or hard of hearing (an exception being one deaf or hard of hearing student taking the grade span six through eight test form). Observations suggest that students taking the Speaking domain had some difficulty due to administration concerns that interacted with accommodations use (e.g., table 8) and, for students who are blind or have low vision, the desire to have an audio cue from the test examiner to accompany the Speaking domain recording function.

6.1.3. Usability of the Audio Delivery Model

In the computer-based ELPAC, audio files are embedded into the student interface. Students are intended to interact with the audio files as they progress through the Listening domain test. Observers rated the extent to which students needed assistance interacting with the audio files, shown in table 13 and table A.9, table B.9, and table C.9.

Table 13. Needing Assistance with the Listening Domain Audio File: Frequency and Percentage of Students Observed in Each Rating Category

Grade or Grade Span	Not at All	Entirely
Grade span 3–5	14 (78)	4 (22)
Grade span 6–8	6 (71)	3 (29)
Grade span 9–12	10 (64)	6 (36)

The data in table 13 suggests that 22 to 36 percent of students needed assistance using the embedded audio files on the Listening domain. Examining the data further, only 14 to 43 percent of EL students needed assistance playing the audio files, compared to 14 to 38 percent of non-ELs needing assistance. Differences emerge at the disability level, where 20 to 100 percent of ELs who were blind or had low vision needed assistance, compared to only 11 to 30 percent of ELs who were deaf or hard or hearing needing assistance (table B.9). Similar patterns emerge when examining data from non-ELs, where 50 to 100 percent of non-EL students who were blind or low vision needed assistance, compared to 13 to 17 percent of non-EL students who were deaf or hard of hearing needing assistance (table C.9). Observation and interview notes suggest that students mistook the audio file [**PLAY**] button as the location for the ASL videos (refer to table 8). Students who used the screen reader accommodation also needed assistance starting, stopping, and navigating past the audio files without accidentally activating the audio file. In both instances, test examiners were critical to assisting the students experiencing these challenges in consistently navigating and interacting with the audio file.

6.1.4. Usability of the Speaking Recording Function

The computer-based ELPAC featured an embedded microphone recording icon used to record students' spoken responses. Findings suggested that although some students who are blind or have low vision expressed interest in activating their own recording, test examiners largely administered the Speaking domain and activated the audio recording for students. This finding supports the intended administration directions for the Speaking domain. However, there were some instances where confusion was observed regarding directions for students to access their refreshable braille display for the alt text and how and when the students should stop and allow the test examiner to take over again. Table 14 and table A.10, table B.10, and table C.10 describe the students' interaction with the recording function, specifically a hesitation to record.

Table 14. Speaking Hesitant to Record: Frequency and Percentage of Students Observed in Each Rating Category

Grade or Grade Span	Not at All	Entirely
TK/K	4 (92)	< 1 (8)
Grade 1	2 (100)	0 (0)
Grade 2	N/A	N/A
Grade span 3–5	16 (94)	2 (6)
Grade span 6–8	8 (100)	< 0 (0)
Grade span 9–12	11 (89)	1 (11)

The data in table 14 summarizes the extent to which students were hesitant to record the spoken response. Students taking the grade two test were exempt from this domain and were not included in the analysis. Ratings suggest that some students demonstrated some hesitation to have the response recorded when taking the grade span three through five or grade span nine through twelve test forms (6 and 11 percent, respectively). Disaggregating the data, table A.10 suggests only slight differences emerge across EL status, with few students being hesitant to record in TK/K or grade span nine through twelve. Observational and interview data indicates that some students were hesitant due to a lack of confidence in understanding the task. For example, one student who was blind and had autism interpreted the recording directions more literally, thinking the computer was listening to him. Other students were unsure of what to say because of challenges in relating to the topic in the task type (e.g., Talk About a Scene) or challenges when the accommodations presented content simultaneously (e.g., Summarize an Academic Presentation). Overall, findings suggest that despite any hesitation, students in the study still had enough time to record the verbal response.

6.1.5. Typing on the Computer to Respond to Writing Items

With the transition to a computer-based ELPAC, students taking the Writing domain test were required to type responses on a device or external QWERTY keyboard. Observers were asked to rate students' demonstrated familiarity with typing on the computer. Table 15 summarizes the ratings for students from grades three through twelve. The data is disaggregated and presented across table A.11, table B.11, and table C.11.

Table 15. Writing Domain Student Familiarity with Typing: Frequency and Percentage of Students Observed in Each Rating Category

Grade or Grade Span	Not at All	Partially	Entirely
Grade span 3–5	2 (10)	12 (54)	8 (36)
Grade span 6–8	0 (0)	1 (6)	8 (94)
Grade span 9–12	1 (6)	0 (0)	16 (94)

Of the frequencies and percentages shown in table 15, the data suggests that students' familiarity with typing ranges from 36 percent for students taking the grade span three

through five Writing domain test to 94 percent for students taking the grade span six through eight and grade span nine through twelve Writing domain tests. Examining the data by EL status, table A.11 shows that 69 to 95 percent of EL students were familiar with typing compared to 19 to 100 percent of non-EL students. Further differences emerge at the grade level and disability level, where non-EL students who were deaf or hard of hearing were less familiar with typing on the grade span three through five test form (20 percent) compared to 89 to 100 percent familiarity for non-EL students who were deaf or hard of hearing taking the other grade span test forms. This suggests that non-EL students in grade span three through five who were deaf or hard of hearing were less familiar with typing skills compared to the other students participating in the study (table C.11). Observational and interview data suggests that students taking the grade span three through five Writing domain test were still learning how to type; many using two index fingers to do so. Some grade span three through five students reported having some access to typing each week (n=10) or at least once a month (n=11) with some saying they have not typed before (n=7).

6.1.6. Usability of the Writing Tools

The students in this study were observed to type the responses in the Writing domain test. However, of all the students that took the Writing domain test, none were observed to use the writing tools that were embedded into the testing platform. These tools consisted of typical word processing stylistic and editing features such as bold, italics, underline, bullets, copy, paste, and indentation. Instead, students who are blind or have low vision were observed to have some usability challenges navigating past the writing tools to enter the cursor into the edit box to begin typing.

In these instances, students were using QWERTY keyboard commands to navigate JAWS through the item. Once students reached the edit box they were observed to have to navigate through a series of buttons (including each of the writing tools) before they could enter the next command to begin typing. In addition to the increased usability load for these students, some were observed to need a reminder of the task directions at this stage. Interview follow-ups confirmed that the students and test examiners considered that the navigation for the Writing domain was "a lot" and suggested that removing the visual stylistic features like the writing tools could be an improvement since it might reduce the navigation load for the students.

6.2. Accessibility Resources

In the study, the full suite of embedded and non-embedded accessibility resources was available for the students. The accessibility resources most commonly used in this study included TNA, ASL videos, closed captioning, and print-on-demand (proxy with the preprinted color item printouts) for students who were deaf or hard of hearing. The resources for students who were blind or had low vision most commonly included TNA, braille, screen reader (JAWS), keyboard navigation, zoom, magnification, line reader, color contrast, and print on demand (pre-embossed item books and tactile graphics). As a function of the study, all students were tested one-on-one in an alternate test setting. Additionally, students could exempt from test domains following an IEP or a student or text examiner request as allowed for this study. Test examiners confirmed that the one-

on-one administration in an alternate setting is part of the typical administration procedures for students with ASL video or braille accommodations. The following information in this section is based on the frequencies and descriptive data obtained from the rating scales and supplemented with the observation and interview data. Similar to the previous section, all data is reported in the aggregate and, due to rounding, values reported may not equal to 100.

6.2.1. Test Navigation Assistance (TNA) Role

The TNA role was of interest in this study due to its novelty and importance on the computer-based ELPAC. The TNA role was implemented as a result of the ELPAC Usability Pilot (ETS, 2019) to ensure that students would have support to mitigate any technology challenges so that they would not be negatively impacted by the computer delivery of the test. The TNA role is a non-embedded universal tool, and thus the support is provided by the test examiner. In the study, observers rated whether students needed support, if students requested support, and if test examiners provided support.

Table 16 through table 18 report on the TNA findings across grade spans and test domains. The TNA role for TK/K, grade one, and grade two is not included due to the test examiner-led administration models for the computer-based ELPAC.

Table 16 illustrates that, overall, some students were generally observed to need support with the technology component of the test. Disaggregated data is reported in table A.12, table B.12, and table C.12.

Table 16. Students Needed Technological Assistance: Frequency and Percentage of Students Observed in Each Rating Category

Domain	Grade or Grade Span	No	Yes
Listening	Grade span 3–5	13 (72)	5 (28)
Listening	Grade span 6–8	5 (57)	3 (43)
Listening	Grade span 9–12	10 (64)	5 (36)
Reading	Grade span 3–5	16 (89)	2 (11)
Reading	Grade span 6–8	4 (86)	1 (14)
Reading	Grade span 9–12	14 (89)	2 (11)
Writing	Grade span 3–5	16 (74)	6 (26)
Writing	Grade span 6–8	8 (94)	1 (6)
Writing	Grade span 9–12	13 (76)	5 (24)
Speaking	Grade span 3–5	16 (94)	1 (7)
Speaking	Grade span 6–8	7 (89)	1 (11)
Speaking	Grade span 9–12	10 (87)	2 (13)

The data suggests that students needed more support on the Listening domain compared to the other domains, with values ranging from 28 to 43 percent on the Listening domain compared to the 7 to 13 percent needing assistance for the Speaking domain. When examining the data by EL status, both EL and non-EL students were observed as needing technological assistance on the Listening domain (table A.12).

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The Writing domain also emerged as a domain where both EL and non-EL students needed additional assistance. Examining the data by disability, evidence suggests that the findings may be attributed to both EL and non-EL students who are blind or have low vision and are taking the braille test form (table B.12, table C.12). This finding about the Listening domain may be due to the administration order, where the training test order began with the Listening domain and ended with the Speaking domain. Additionally, the increased test examiner role with the delivery of the Speaking domain content is likely to have reduced the need for additional TNA support. The findings of the Writing domain and challenges for students who are blind or low vision taking the braille test form are consistent with previous findings shown in table 7, table 11, and table 12.

Table 17 reports on the extent to which students made a request for TNA support. Corresponding disaggregated data is shown in table A.13, table B.13, and table C.13. Data in table 17 suggests that students overall were not observed to request assistance. Examining the data by EL status, no notable group differences were observed (table A.13), although very slight differences emerge when considering disability. Regardless of EL status, students who were blind or low vision were slightly more likely to have requested assistance compared to their peers who were deaf or hard of hearing (table B.13, table C.13). Observers notes suggested that when students did request assistance, the requests were both verbal and gestural. Overall, across grade span tests and domains the data remains similar. Findings suggest that students mostly did not ask for help from the test examiner.

Table 17. Students Requested Technological Assistance: Frequency and Percentage of Students Observed in Each Rating Category

Domain	Grade or Grade Span	No	Yes
Listening	Grade span 3–5	16 (88)	2 (13)
Listening	Grade span 6–8	5 (64)	2 (29)
Listening	Grade span 9–12	14 (96)	1 (4)
Reading	Grade span 3–5	17 (93)	1 (7)
Reading	Grade span 6–8	5 (100)	0 (0)
Reading	Grade span 9–12	16 (100)	2 (11)
Writing	Grade span 3–5	22 (100)	0 (0)
Writing	Grade span 6–8	8 (94)	1 (6)
Writing	Grade span 9–12	16 (97)	1 (3)
Speaking	Grade span 3–5	17 (98)	< 1 (2)
Speaking	Grade span 6–8	8 (100)	0 (0)
Speaking	Grade span 9–12	12 (98)	< 1 (2)

Table 18 includes ratings to the extent that test examiners assisted the students, whether or not the students requested the assistance. Table A.14, table B.14, and table C.14 show the data disaggregated by EL status and disability. Overall in table 17, the data values ranging from 21 to 63 percent suggests that test examiners did provide assistance across the grade span domain level tests. When the data in table 18 is compared to data in the previous table 17, findings suggest that students were observed to need TNA, but they were not observed to make requests to the test examiner for TNA support. Examining the data across EL status, both EL and non-EL students received assistance across the domains, and that assistance was observed more often on the Listening domain or Writing domain (table A.14). Examining the data by EL status and disability, data in table B.14 suggests that although EL students who were blind or had low vision were more likely to receive assistance (ranging from 40 to 100 percent across domains and grade levels), some EL students who were deaf or hard of hearing were also observed to receive assistance (ranging from 25 to 78 percent across domains and grade levels). Specific to non-ELs in table C.14, students who were blind or had low vision were observed to receive assistance (33 to 100 percent across domains and grade levels), compared to non-EL students who were deaf or hard of hearing (34 to 68 percent across domains and grade levels). In sum, test examiners were observed to provide TNA support to the students, even if the students did not request it.

Table 18. Students Received Technological Assistance: Frequency and Percentage of Students Observed in Each Rating Category

Domain	Grade or Grade Span	No	Yes
Listening	Grade span 3–5	7 (38)	11 (63)
Listening	Grade span 6–8	4 (50)	4 (50
Listening	Grade span 9–12	7 (46)	8 (53)
Reading	Grade span 3–5	11 (61)	8 (39)
Reading	Grade span 6–8	4 (71)	1 (29)
Reading	Grade span 9–12	11 (70)	5 (30)
Writing	Grade span 3–5	16 (74)	6 (26)
Writing	Grade span 6–8	6 (69)	3 (32)
Writing	Grade span 9–12	11 (67)	6 (33)
Speaking	Grade span 3–5	10 (58)	7 (43)
Speaking	Grade span 6–8	6 (79)	2 (21)
Speaking	Grade span 9–12	5 (44)	7 (56)

6.2.2. Students' Use of Accessibility Resources

Observers rated the students' use of accessibility resources across the study. By design, the most frequently used resources were the ASL video, braille, and screen reader accommodations. However, students did use additional accessibility resources as mentioned in the previous section. Thus, the data in this section refers to any accessibility resource the student may have used during the student's interaction with the computer-based ELPAC. Accessibility resources for the Speaking domain are not included in table 19 (or the corresponding disaggregated data in table A.15, table B.15, and table C.15) since the administration of the domain was test examiner-led and test examiners included references to the accessibility resources (e.g., emboss on demand tactile graphics) as part of the administration directions.

Table 19. Reminders to Use Accessibility Resources: Frequency and Percentage of Students Observed in Each Rating Category

Domain	Grade or Grade Span	No	Yes
Listening	Grade span 3–5	14 (78)	4 (22)
Listening	Grade span 6–8	5 (64)	3 (36)
Listening	Grade span 9–12	13 (89)	2 (11)
Reading	Grade span 3–5	13 (71)	5 (28)
Reading	Grade span 6–8	5 (100)	0 (0)
Reading	Grade span 9–12	15 (96)	1 (4)
Writing	Grade span 3–5	15 (67)	8 (34)
Writing	Grade span 6–8	7 (81)	2 (19)
Writing	Grade span 9–12	15 (88)	2 (12)

In table 19, the reported data suggests that test examiners reminded some students to use the accommodations. The data suggests that test examiners reminded students more frequently on the Listening domain (11 to 36 percent) or the Writing domain (12 to 34 percent) compared to the Reading domain (0 to 28 percent). Examining data by EL status, ELs were observed to receive reminders about using accessibility resources across the domains (e.g., 5 to 43 percent on the Listening domain, 6 to 31 percent on the Reading domain, and 5 to 23 percent on the Writing domain) compared to non-ELs ranging from 22 to 28 percent on the Listening domain, 0 to 27 percent on the Reading domain, and 25 to 38 percent on the Writing domain. Examining by disability category, data in table B.15 and table C.15 suggest that some reminders were received by students across EL status and disability categories, suggesting no meaningful pattern emerged from group differences in the obtained descriptive data. Observational and field note data suggest differences may be due to the administrative directions (e.g., for the Reading domain, where students were likely to be more independent when reading passages).

6.2.3. Students' Use of the Accessibility Resources

In addition to noting when students needed reminders to use the available accessibility resources, observers also recorded when test examiners assisted students with the usability of the accessibility resources. Although all students were able to take the computer-based ELPAC on the computer, students did have varying levels of familiarity with the digital versions of the accommodations (e.g., ASL video, refreshable braille).

The following table 20 reports the observed frequency and percentages that test examiners were noted to assist students in using the accessibility resources. Table A.16, table B.16, and table C.16 show the data disaggregated by EL status and disability category.

Table 20. Students Whose Test Examiners Assisted with the Accessibility Resources: Frequency and Percentage of Students Observed in Each Rating

Domain	Grade or Grade Span	No	Yes
Listening	Grade span 3–5	15 (84)	3 (15)
Listening	Grade span 6–8	5 (64)	3 (35)
Listening	Grade span 9–12	10 (68)	5 (33)
Reading	Grade span 3–5	14 (79)	4 (22)
Reading	Grade span 6–8	4 (71)	1 (29)
Reading	Grade span 9–12	12 (78)	4 (23)
Writing	Grade span 3–5	8 (38)	14 (62)
Writing	Grade span 6–8	6 (69)	3 (31)
Writing	Grade span 9–12	11 (67)	6 (33)

In table 20, the data suggests that students needed varying levels of assistance to use the accessibility resources. Data for TK/K, grade one, and grade two test forms were not included in the table due to the test examiner-led administration directions for these grade-level tests. Of the data reported across grade spans three through five, six through eight, and nine through twelve, the findings suggest that some students did need assistance with the accessibility resources. Findings for the Listening domain suggest that 15 to 35 percent of the students were observed receiving assistance, compared to 22 to 29 percent of students who were observed receiving assistance on the Reading domain. On the Writing domain, 31 to 62 percent of students were observed receiving assistance from the test examiners. Examining the data by EL status in table A.16, 14 to 60 percent of EL students were observed to have test examiners who assisted with accessibility resources on the Listening domain, 0 to 24 percent taking the Reading domain, and 0 to 14 percent taking the Writing domain; compared to 17 to 38 percent of non-ELs taking the Listening domain, 20 to 50 percent taking the Reading domain, and 25 to 42 percent taking the Writing domain. Examining further by disability category, the data in table B.16 and table C.16 suggest that EL and non-EL students who were blind or had low vision experienced more assistance with accessibility resources, ranging from 20 to 100 percent and 100 percent, respectively,

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on the Listening domain; 33 to 50 percent and 100 percent, respectively, on the Reading domain; and 0 to 100 percent and 0 to 10 percent, respectively, on the Speaking domain. EL and non-EL students who were deaf or hard of hearing were also observed to receive assistance, but the majority of the EL and non-EL students who were deaf or hard of hearing were not observed to receive assistance from test examiners.

Observational and interview data suggest that the assistance that was provided ranged from verbal direct instruction on the location and usability of the accommodation (i.e., "click here for your ASL video" or "hit *Q* to enter the main region") to a complete takeover of the device to manually explore how to "fix" the accommodation (e.g., when the closed captioning and ASL videos were activated at the same time and visually overlapped each other or when the [**NEXT**] icon visually disappeared on the test when zoom and magnification were used simultaneously and keyboard commands would no longer work to advance to the next item).

6.3. Usability of the *Directions for Administration*

The third area of investigation focused on the use and usability of the *DFAs.* The data in this section include the ratings and observations from the test examiner observation and rating protocol form (part of the ETS observers' protocol) and interview findings from the test examiners. Findings indicated that irrespective of the cognitive lab setting, test examiners administer the ELPAC one-on-one to the students who are blind or have low vision or who were deaf or hard of hearing. Because of this one-on-one test administration at all grade levels, test examiners requested access to a *DFA* for each administration. Additional findings suggested that the test examiners found the *DFAs* to be relatively clear and easy to use. Feedback from the interviews suggested that the *DFAs* were largely designed for test administrations to students who can see and hear, and thus test examiners felt tension at wanting to adapt language in the *DFAs* while acknowledging knowing it should be a standardized administration. Test examiners also shared recommendations for additions to the *DFAs* that would better assist them in administering the accommodated test forms to the students. These details are reported in the next section.

6.3.1. Clarity of the *DFAs*

Observational and interview evidence from the test examiners in the study indicated that, overall, the *DFAs* were mostly clear and easy to use. The ratings summarized in table 21 through table 22 display the range of clarity for each of the domains for the grade level and grade span test administrations and the extent to which the test examiners reported the *DFAs* were easy to use. Data is disaggregated by EL status and disability in table A.17, table B.17, and table C.17.

Data in table 21 indicates that the Listening domain *DFA* ranged from 75 to 100 percent clarity. The Reading domain section in the *DFAs* ranged from 67 to 100 percent clarity. The Writing domain section in the *DFAs* ranged from 69 to 79 percent clarity. The Speaking domain section in the *DFAs* ranged from 25 to 100 percent clarity. Examining the data by EL status and disability category in table A.17, table B.17, and table C.17, the data ranges do not suggest a clear pattern for group differences given the variability across EL status and disability category. Instead, some differences are observable across domain (e.g., Listening domain) but are not consistent across grade level or grade span assessments, suggesting that other administrative considerations such as accommodated test form order or the number of administrations may have influenced ratings of the test examiners' observed clarity for the *DFAs*.

Table 21. Clarity of the *DFA* for Test Examiners: Frequency and Percentage of Test Administrations Observed in Each Rating Category

Domain	Grade or Grade Span	Not at All	Partially	Entirely
Listening	TK/K	1 (25)	0 (0)	3 (75)
Listening	Grade 1	0 (0)	0 (0)	2 (100)
Listening	Grade 2	N/A	N/A	N/A
Listening	Grade span 3–5	1 (3)	2 (13)	15 (84)
Listening	Grade span 6–8	0 (0)	0 (0)	8 (100)
Listening	Grade span 9–12	2 (14)	1 (7)	12 (79)
Reading	TK/K	2 (33)	0 (0)	4 (67)
Reading	Grade 1	2 (28)	< 1 (6)	5 (67)
Reading	Grade 2	0 (0)	0 (0)	3 (100)
Reading	Grade span 3–5	1 (7)	2 (11)	15 (82)
Reading	Grade span 6–8	0 (0)	1 (29)	4 (71)
Reading	Grade span 9–12	3 (19)	1 (4)	12 (78)
Writing	Grade span 3–5	6 (28)	1 (3)	15 (69)
Writing	Grade span 6–8	3 (31)	0 (0)	6 (69)
Writing	Grade span 9–12	2 (9)	2 (12)	13 (79)
Speaking	TK/K	0 (0)	3 (75)	1 (25)
Speaking	Grade 1	0 (0)	0 (0)	2 (100)
Speaking	Grade 2	N/A	N/A	N/A
Speaking	Grade span 3–5	2 (11)	4 (26)	11 (64)
Speaking	Grade span 6–8	1 (7)	4 (50)	3 (43)
Speaking	Grade span 9–12	0 (0)	6 (53)	6 (47)

Table 22 includes interview data from the test examiner. Test examiners were asked to rate whether the *DFAs* were easy to use when administering the accommodated computer-based ELPAC to the students. Overall, test examiners reported that the *DFAs* were easy to use, with 9 of 10 test examiners rating the Listening and Writing domains as easy to administer and 7 of 10 test examiners rating the Reading and Speaking domains as easy to administer.

Table 22. Test Examiner Interview Response: Frequency of Ease of Use with the *DFAs*

Statement	Agree	Disagree
The **Listening** test was easy to administer based on the *DFAs*.	9	1
The **Reading** test was easy to administer based on the *DFAs*.	7	3
The **Writing** test was easy to administer based on the *DFAs*.	9	1
The **Speaking** test was easy to administer based on the *DFAs*.	7	3

The data suggests that the variation across the ratings could be attributed to information the test examiners wanted that would better equip them for the test administrations. Test examiners requested clarification on the directions, particularly for the administrations where students used ASL videos. When students would ask for clarification, test examiners often had to rewatch the ASL videos. To avoid rewatching the videos, they recommended printing the video's directions in the *DFAs.*

Test examiners were observed providing auditory directions to guide students in using the assistive technology. Test examiners who were less familiar with JAWS (since their students use iPads or other assistive technology) were observed using Google or other resources to assist the students with navigating JAWS keyboard commands. Test examiners reported calling the state school (e.g., California School for the Blind) for additional assistance when needed. Test examiners recommended that existing ELPAC resources like the California Technical Assistance Center (CalTAC) could be enhanced by dedicated accessibility expertise. Additionally, all test examiners shared recommendations for including standardized, adapted language across *DFAs* and other materials that meets the sensory needs of blind or low vision or deaf or hard of hearing students. For example, test examiners administering the test to students who are blind or low vision were observed using consistent orienting and navigation language (e.g., "hit Q to enter the main region then down arrow…"). Test examiners pointed out sensitivity concerns with the direction to guide students through the audio check at the start of the test, or to direct the students to "listen" to the directions or content from the embedded audio file on the test items.

7. Limitations of the Study

This study's purpose was to gather in-depth evidence about EL students' and test examiners' interactions with the computer-based ELPAC, the accessibility resources, and the test examiner materials. The study was conducted with the first accommodated materials for the computer-based ELPAC and *DFAs.* The items were reviewed by TVIs but not TODs. Additionally, the corresponding *DFAs* were not part of the reviews. It is possible that with robust reviews, the materials would have been further adapted in a manner that could further improve students' usability of the test. Additionally, since these training test materials were the first available with accommodations, it is likely that other opportunities for familiarity (e.g., through accommodated tutorials) may be helpful for students before engaging in the ELPAC accommodated training test forms.

The study occurred during the fall, after the beginning of the school year initial ELPAC testing and before the winter holiday breaks. Previous research has yielded findings that students from low-incidence disability groups have multiple competing demands at the start of the summative testing windows (i.e., increased demands on student and test examiner time, subsequent demands on school technology; ETS, 2019b) after the winter break. While oversampling was conducted to ensure that 72 students fitting the sampling criteria could participate, the schools were subjected to closures due to rolling blackouts and wildfires across the state's northern and southern regions during the data collection window. Ultimately, these complications across the state resulted in schools and students dropping from the study, thus decreasing the total number of EL students and students who are blind or have low vision who were available to participate. Additionally, although efforts were made to maximize the demographic variability of the sample, some demographics were more homogeneous in nature (e.g., EL students who were recent arrivals did not participate in the study despite best efforts to recruit). As a result, it is possible that the study findings may change if EL students who are recent arrivals and who are blind or have low vision or who are deaf or hard of hearing participated.

Twenty-five students who were deaf or hard of hearing were exempted from the Listening and Speaking domains despite ASL being an allowable accommodation. Test examiners expressed concern with validity, reliability, and students' deaf identity when the students were required to take an English language proficiency test that includes Listening and Speaking skills. Test examiners requested the opportunity to exempt students who were deaf from both the Listening and Speaking domains to allow them to validate the deaf experience and meet the needs of the range of learners who are deaf or hard of hearing. Consequently, the research study context provided a more flexible testing experience compared to the test administration policy of the operational computer-based ELPAC, limiting generalization for this student group.

Ultimately, the strength of using cognitive lab methodology to gather in-depth information is particularly relevant for low-incidence disability populations included in the current study. However, it is important to recognize that disabilities are highly individualized within the students. Taken together, ETS cautions against overgeneralizing the findings from this study.

8. Recommendations

Findings from the study indicate that while students and test examiners were generally able to take and administer the accommodated computer-based ELPAC, some challenges were experienced. The following recommendations summarize the evidence collected and reported on previously in section 6, and elaborate on considerations to improve the testing experience, validity, and reliability of the computer-based ELPAC for ELs with low-incidence disabilities. Due to the interrelated scope of California's testing programs and iterative work that comes with the following recommendations, an evaluation to determine the impact across California testing programs is encouraged. The enhancements to the computer-based ELPAC should ideally be applied to the remainder of California's tests where applicable. These explorations may take into account the potential impact of the cross-program implications and the need to stagger accessibility efforts so that any enhancements yield a cohesive, comprehensive approach to improving the computer-based ELPAC's accessibility. This timeline should be evaluated in the context of the current global situation to determine any impact the 2019 novel coronavirus disease (COVID-19) pandemic may have on the implementation of the study recommendations.

8.1 Recommendations to Support Students' Interactions on the Computer-based ELPAC Items

8.1.1 Recommendation 1: Review Test Materials from the User Perspective

Enhance accommodation reviews (e.g., at the authoring, delivery, and stakeholder level) by increasing the participation of the blind and low vision community and the deaf and hard of hearing community.

Context:

During the administration of the cognitive lab items, students commented on the quality of the accommodations. Feedback from students ranged from what was being perceived as typos in the refreshable braille or a lack of clarity to Signed Exact English in the ASL videos. In these instances, students had to ask the test examiner for assistance with interpreting the content presented through the refreshable braille or ASL video. Suggestions on ways to ensure that the content is maximally accessible and to minimize instances where the test examiner is requested to provide assistance on the item content are listed in the next subsection, *Proposed Actions*. For more details, refer to section 6.1, table 5 through table 8, and section 6.2, table 20.

Proposed Actions:

1. Continue to review test forms and accommodations to ensure they are present and functional in the testing interface

2. EL students who are blind or have low vision and are proficient users of refreshable braille, embossed braille, zoom, magnification, and related allowable accessibility resources should review the braille transcriptions and related test

accommodations in the practice and training tests to ensure the ELPAC test forms are accessible for ELs who are blind or have low vision

3. EL students who are deaf and fluent users of ASL and persons who are hard of hearing and use closed-captioning and related allowable accessibility resources should review the accommodations in the practice and training tests to ensure the general ELPAC test forms are accessible for ELs who are deaf or hard of hearing

8.1.2 Recommendation 2: Enhance Writing Response Areas

Investigate improvements for the Writing domain CR boxes in the braille test form to promote usability and accessibility for students using refreshable braille and keyboard navigation.

Context:

Students who were blind or had low vision had difficulty interacting with the Writing domain independently and required specific assistance to navigate through the Writing domain. Even with this verbal assistance, challenges often persisted, and test examiners were observed having to step in and navigate for the student. To ensure that the content is presented in an accessible and usable manner, allowing students to be independent throughout the test, suggested actions are presented in the following list. For more details, refer to section 6.1 and section 6.2, table 11, table 12, table 15, and table 20.

Proposed Actions:

1. Improve the Writing domain test so that it is both more usable and accessible for students who are using refreshable braille or keyboard navigation; to do this, start by collaborating with the following individuals:

   - Accessibility experts and programmers, to develop alternative programming solutions to improve the usability of the Writing domain

     – TVIs knowledgeable in refreshable braille and keyboard navigation, to prototype alternative solutions and provide feedback

     – Students who use refreshable braille and keyboard navigation, to access the Writing domain test

4. Develop tutorials specifically targeting recommended steps on how to navigate the Writing domain for students using keyboard navigation and refreshable braille

5. Develop additional guidance around assistive technology and the TNA and Designated Interface Assistant (DIA) roles for test examiners and TVIs administering the Writing domain to students using the keyboard navigation and refreshable braille accessibility resources, with guidance that describes the following:

   - Common usability challenges that students may experience

     – Allowable support that test examiners can provide through the TNA or DIA roles

8.2 Recommendations to Enhance Accessibility Resources on the Computer-based ELPAC

8.2.1. Recommendation 3: Integrate Zoom and Magnification Resources

Investigate additional processes to reduce interaction effects and promote compatibility, usability, and accessibility for students needing to simultaneously use both zoom and magnification accessibility resources on the computer-based ELPAC.

Context:

Students with low vision needed a variety of resources to make the text on the student device accessible. Two commonly used text enlargement accessibility resources were zoom and magnification. Although these are both allowed on the computer-based ELPAC, in instances where students required more significant enlargement, students experienced difficulty with the compatibility between zoom and magnification. In some instances, the [**NEXT**] button disappeared, and readability of the item text was diminished. The following steps are suggested to ensure that the accessibility resources work in concert for students who may need to use several resources simultaneously. For more details, refer to section 6.2, table 20.

Proposed Actions:

1. Multiple stakeholders, including persons with low vision, should collaborate to investigate potential solutions, ensuring the following:

    - Usability for both embedded and non-embedded digital tools that enlarge content can be seamlessly integrated

        – Enlarged text does not encroach on white space and overlap the text lines

        – The [**NEXT**] button in the toolbar can always remain visible and static regardless of the level of magnification for the test content

        – Keyboard navigation integrates seamlessly with magnified content and is synchronized with the view of the test content displayed on the student interface

2. Create accessible tutorials to demonstrate how to use the magnification and zoom accessibility resources in concert

3. Create guidance around the assistive technology and the TNA and DIA roles to assist test examiners and TVIs in delivering standardized support for ELs with low vision who are taking the computer-based ELPAC

8.2.2. Recommendation 4: Make ASL and CC Resources Easier to Find

Investigate solutions to improve access to the ASL video and closed-captioning accommodations that are consistent with the presentation of the existing accessibility resources.

Context:

Students who used the ASL and closed-captioning accommodations were initially confused as to how to access the accommodations. Some students required guidance from the test examiner, while others needed multiple promptings. Students explained that the presentation was somewhat confusing, and the accommodations seemed to be "hidden." The following actions detail suggested steps to improve the presentation and access of the ASL and closed-captioning accommodations. For more details, refer to section 6.2, table 20.

Proposed Actions:

1. Identify improvements to the test delivery system user interface that consider how to do the following:

    - Provide an icon or similar with direct access to the ASL video(s) (The image for the ASL video icon should be the universal image for the interpreter.)

        – Provide an icon or similar with direct access to the closed-captioning accessibility resource (The image for the closed-captioning icon should be the universal image for closed-captioning.)

2. Create tutorials specific to the revised locations and use of the ASL videos and closed-captioning resources

8.2.3 Recommendation 5: Enhance Braille Access on iPads

Make the braille test form accessible on the iPad.

Context:

During the cognitive lab recruitment, multiple LEAs asked about students being able to use an iPad to access the braille test form. Note that the ELPAC currently supports iPads that have a 9.7" or larger display and are running a supported version of iOS and iPadOS with Safari 11, 12, or 13 (CDE, 2019). After extensive internal usability testing to prepare for the cognitive lab administration, iPads could not be recommended for students to access the braille training test form for the cognitive lab study. ETS recommended that for students to participate on the computer-based ELPAC with an iPad and VoiceOver accommodation, further enhancements would be needed to improve usability and accessibility. Although these students participated in the cognitive lab using JAWS, students and test examiners needed assistance to use JAWS effectively and expressed the desire to use the preferred device in operational test settings. For more details, refer to section 6.2, table 16 through table 18; and section 7.

Proposed Actions:

1. Continue to collaborate with the test delivery system development team to ensure that the [NEXT] button is accessible for students who are blind or low vision and using screen readers (e.g., VoiceOver)

2. Request that existing networks and partnerships submit letters to Apple, petitioning the company to invest resources in creating braille regions for VoiceOver

8.3 Recommendations to Improve the Usability of the Test Administration Materials for the Computer-based ELPAC

8.3.1. Recommendation 6: Improve *DFAs* for Deaf or Hard of Hearing Test Administrations

Improve the *DFAs* to support test examiners administering the computer-based ELPAC to EL students who are deaf or hard of hearing.

Context:

Test examiners were observed to manipulate the printed *DFAs* when looking for text or guidance on what to adapt and how to adapt the test administration language for students who are deaf or hard of hearing. Test examiners reported a need to be able to pick up the *DFA* and read it as-is without having to make adaptations for sensitivity or to improve administrability for students who are deaf or hard of hearing. The following actions outline proposed changes to the *DFAs*. For more details, refer to section 6.3, table 21 and table 22.

Proposed Actions:

1. Add industry-standard closed-captioning to indicate that sound is being played. Investigate ways so that the animated sound check in the student interface start-up screen can be suppressed when administering to students who are deaf. (Note: this recommendation will impact all tests using the California Assessment System)

2. Consider terms used in the direction statements in the DFAs and consider using terms other than "listen" or "say" to promote awareness and sensitivity for students who are deaf or hard of hearing. (Note: This recommendation will impact all tests using the California Assessment System.)

3. Consider ways to provide the written directions in the *DFAs* so the test examiner (who is fluent in ASL) or the ASL interpreter can clarify or simplify test directions for the test taker.

4. Continue refining the guidance for test examiners who are fluent users of ASL and ASL interpreters to support students interacting with the ASL videos. (Note: this recommendation will impact all tests using the California Assessment System)

5. Include additional standardized language in the *DFA* so the test examiner can explain, when applicable, that the microphone for the Speaking domain is not associated with the students' assistive technology (i.e., cochlear implant). (Note: this recommendation will impact all tests using the California Assessment System)

8.3.2. Recommendation 7: Enhance Braille *DFAs*

Enhance the braille test form *DFAs* to support standardized initial test navigation for students who are blind or have low vision.

Context:

Teachers of the visually impaired consistently provided initial guidance to the students as each domain test began. To ensure that test examiners are following standardized delivery of the language for the test administration, this direction and navigational language should be included in the *DFAs* for the braille test forms for continuity across the products for the computer-based ELPAC. The following proposed actions detail specific steps to ensure the braille test forms and accompanying *DFAs* include guidance for test examiners administering the computer-based ELPAC to students who are blind or have low vision. For more details, refer to section 6.3, table 21 through table 22.

Proposed Actions:

1. Add specific directions to the DFAs for test examiners or TVIs to set the JAWS audio options for each test domain. (Note: this recommendation will impact all tests using the California Assessment System)

2. Add standardized navigation language to the *DFAs* for test examiners and TVIs to guide students through the initial interaction for each domain test. (Note: this recommendation will impact all tests using the California Assessment System)

3. Collaborate with disability stakeholders (e.g., TVIs) to create and add directions for test examiners or TVIs to guide students on how to interact with the Listening domain content when JAWS simultaneously reads aloud the content on the screen, along the with prerecorded audio file. (Note: this recommendation will impact all tests using the California Assessment System)

4. Explore how to increase use of the "JAWS Help" features (e.g., the JAWS keyboard commands tables in the *2019-2020 Test Administration CAASPP and ELPAC Accessibility Guide for Online Testing*) that can be used as a resource for test examiners and TVIs administering the ELPAC to ELs who are blind or have low vision. (Note: this recommendation will impact all tests using the California Assessment System)

8.3.3. Recommendation 8: Enhance Call Center Resources

Enhance the call center experience for stakeholders who are reporting issues with accommodated test administrations and accessibility resources.

Context:

Test examiners reported that, although CalTAC contact information is included in the *DFAs*, timely and accurate resolution is often a challenge. Test examiners reported a desire to have a dedicated line or a person dedicated to the challenges experienced when administering the standardized tests to students with disabilities. The following actions outline considerations for executing this recommendation. For more details, refer to section 6.3, table 21 through table 22.

Proposed Actions:

1. Enhance resources for accessibility resources and test administrations for students with disabilities at CalTAC and the ELPAC website, exploring combinations of resources ranging from accessibility and sensitivity trainings for staff, an updated frequently asked questions web page for test administrations for students with disabilities, and continued communication updates to the field

2. Consult with the California School for the Deaf and the California School for the Blind to ensure that the enhancements meet the needs of the key stakeholders in the field

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Appendices

Appendix A: English Learner (EL) Status Student Groups

Note: In table A.1 through table A.17

- K = kindergarten,
- TK = transitional kindergarten, and
- N/A indicates that no data was collected for the domain.

Refer to section 6 for a description of data missingness and rounding procedures, and suggestions for interpreting the weighted means.

Table A.1. Listening Domain Understanding Directions: Frequency and Percentage of Students Observed in Each Rating Category by EL Status

EL Status	Grade or Grade Span	Not at All	Partially	Entirely
EL	TK/K	0 (0)	0 (0)	2 (100)
EL	Grade 1	1 (100)	0 (0)	0 (0)
EL	Grade 2	N/A	N/A	N/A
EL	Grade span 3–5	1 (7)	2 (21)	6 (71)
EL	Grade span 6–8	0 (0)	2 (43)	2 (57)
EL	Grade span 9–12	0 (0)	4 (34)	7 (65)
Non-EL	TK/K	0 (0)	0 (0)	2 (100)
Non-EL	Grade 1	0 (0)	1 (50)	1 (50)
Non-EL	Grade 2	N/A	N/A	N/A
Non-EL	Grade span 3–5	0 (0)	1 (11)	9 (89)
Non-EL	Grade span 6–8	0 (0)	0 (0)	4 (100)
Non-EL	Grade span 9–12	0 (0)	1 (13)	4 (88)

Table A.2. Reading Domain Understanding Directions: Frequency and Percentage of Students Observed in Each Rating Category by EL Status

EL Status	Grade or Grade Span	Not at All	Partially	Entirely
EL	TK/K	0 (0)	0 (0)	2 (100)
EL	Grade 1	1 (100)	0 (0)	0 (0)
EL	Grade 2	N/A	N/A	N/A
EL	Grade span 3–5	1 (8)	1 (15)	6 (77)
EL	Grade span 6–8	0 (0)	0 (0)	3 (100)
EL	Grade span 9–12	0 (0)	1 (13)	10 (88)
Non-EL	TK/K	0 (0)	1 (25)	3 (75)
Non-EL	Grade 1	0 (0)	2 (27)	5 (73)
Non-EL	Grade 2	0 (0)	0 (0)	3 (100)
Non-EL	Grade span 3–5	0 (0)	3 (27)	7 (73)
Non-EL	Grade span 6–8	0 (0)	0 (0)	2 (100)
Non-EL	Grade span 9–12	0 (0)	1 (10)	5 (90)

Table A.3. Writing Domain Understanding Directions: Frequency and Percentage of Students Observed in Each Rating Category by EL Status

EL Status	Grade or Grade Span	Not at All	Partially	Entirely
EL	Grade span 3–5	2 (23)	1 (15)	5 (62)
EL	Grade span 6–8	0 (0)	1 (25)	2 (75)
EL	Grade span 9–12	0 (0)	4 (38)	7 (62)
Non-EL	Grade span 3–5	5 (38)	5 (35)	4 (27)
Non-EL	Grade span 6–8	0 (0)	3 (50)	3 (50)
Non-EL	Grade span 9–12	2 (25)	0 (0)	5 (75)

Table A.4. Speaking Domain Understanding Directions: Frequency and Percentage of Students Observed in Each Rating Category by EL Status

EL Status	Grade or Grade Span	Not at All	Partially	Entirely
EL	TK/K	0 (0)	0 (0)	2 (100)
EL	Grade 1	0 (0)	< 1 (25)	1 (75)
EL	Grade 2	N/A	N/A	N/A
EL	Grade span 3–5	0 (0)	< 1 (5)	7 (95)
EL	Grade span 6–8	0 (0)	0 (0)	4 (100)
EL	Grade span 9–12	1 (7)	< 1 (4)	7 (89)
Non-EL	TK/K	0 (0)	< 1 (13)	2 (88)
Non-EL	Grade 1	0 (0)	< 1 (25)	1 (75)
Non-EL	Grade 2	N/A	N/A	N/A
Non-EL	Grade span 3–5	< 1 (2)	1 (9)	9 (89)
Non-EL	Grade span 6–8	0 (0)	0 (0)	4 (100)
Non-EL	Grade span 9–12	< 1 (6)	1 (18)	3 (76)

Table A.5. Understanding Layout of the Listening Domain: Frequency and Percentage of Students Observed in Each Rating Category by EL Status

EL Status	Grade or Grade Span	Not at All	Partially	Entirely
EL	Grade span 3–5	1 (7)	3 (43)	4 (50)
EL	Grade span 6–8	0 (0)	0 (0)	4 (100)
EL	Grade span 9–12	1 (5)	2 (15)	9 (80)
Non-EL	Grade span 3–5	1 (6)	2 (17)	8 (78)
Non-EL	Grade span 6–8	0 (0)	0 (0)	4 (100)
Non-EL	Grade span 9–12	0 (0)	0 (0)	4 (100)

Table A.6. Understanding Layout of the Reading Domain: Frequency and Percentage of Students Observed in Each Rating Category by EL Status

EL Status	Grade or Grade Span	Not at All	Partially	Entirely
EL	Grade span 3–5	1 (8)	1 (15)	6 (77)
EL	Grade span 6–8	0 (0)	0 (0)	3 (100)
EL	Grade span 9–12	0 (0)	1 (13)	10 (88)
Non-EL	Grade span 3–5	0 (0)	1 (7)	9 (93)
Non-EL	Grade span 6–8	0 (0)	1 (25)	2 (75)
Non-EL	Grade span 9–12	0 (0)	1(10)	5 (90)

Table A.7. Understanding Layout of the Writing Domain: Frequency and Percentage of Students Observed in Each Rating Category by EL Status

EL Status	Grade or Grade Span	Not at All	Partially	Entirely
EL	Grade span 3–5	2 (23)	1 (15)	5 (62)
EL	Grade span 6–8	1 (25)	0 (0)	2 (75)
EL	Grade span 9–12	1 (5)	2 (19)	8 (76)
Non-EL	Grade span 3–5	3 (23)	1 (4)	10 (73)
Non-EL	Grade span 6–8	< 1 (8)	0 (0)	5 (92)
Non-EL	Grade span 9–12	0 (0)	2 (27)	4 (73)

Table A.8. Students Answering Independently: Frequency and Percentage of Students Observed in Each Rating Category by EL Status

EL Status	Domain	Grade or Grade Span	Not at All	Partially	Entirely
EL	Listening	Grade span 3–5	1 (14)	1 (14)	6 (71)
EL	Listening	Grade span 6–8	0 (0)	0 (0)	4 (100)
EL	Listening	Grade span 9–12	0 (0)	3 (25)	8 (75)
EL	Reading	Grade span 3–5	1 (15)	0 (0)	7 (85)
EL	Reading	Grade span 6–8	0 (0)	0 (0)	3 (100)
EL	Reading	Grade span 9–12	0 (0)	0 (0)	11 (100)
EL	Writing	Grade span 3–5	0 (0)	1 (15)	7 (85)
EL	Writing	Grade span 6–8	1 (25)	0 (0)	2 (75)
EL	Writing	Grade span 9–12	0 (0)	1 (5)	10 (95)
EL	Speaking	Grade span 3–5	1 (9)	0 (0)	6 (91)
EL	Speaking	Grade span 6–8	3 (64)	0 (0)	1 (36)
EL	Speaking	Grade span 9–12	2 (29)	< 1 (4)	5 (68)
Non-EL	Listening	Grade span 3–5	0 (0)	1 (6)	9 (94)
Non-EL	Listening	Grade span 6–8	0 (0)	1 (14)	3 (86)
Non-EL	Listening	Grade span 9–12	0 (0)	1 (13)	4 (88)
Non-EL	Reading	Grade span 3–5	0 (0)	1 (6)	9 (94)
Non-EL	Reading	Grade span 6–8	1 (25)	0 (0)	2 (75)
Non-EL	Reading	Grade span 9–12	0 (0)	1 (20)	4 (80)
Non-EL	Writing	Grade span 3–5	1 (8)	2 (15)	11 (77)
Non-EL	Writing	Grade span 6–8	< 1 (8)	0 (0)	5 (92)
Non-EL	Writing	Grade span 9–12	1 (17)	2 (25)	4 (58)
Non-EL	Speaking	Grade span 3–5	2 (20)	< 1 (5)	8 (75)
Non-EL	Speaking	Grade span 6–8	< 1 (12)	2 (41)	2 (47)
Non-EL	Speaking	Grade span 9–12	3 (71)	1 (18)	< 1 (12)

Table A.9. Needing Assistance with the Listening Domain Audio File: Frequency and Percentage of Students Observed in Each Rating Category by EL Status

EL Status	Grade or Grade Span	Not at All	Entirely
EL	Grade span 3–5	7 (86)	1 (14)
EL	Grade span 6–8	1 (57)	2 (43)
EL	Grade span 9–12	7 (65)	4 (35)
Non-EL	Grade span 3–5	7 (72)	3 (28)
Non-EL	Grade span 6–8	3 (86)	1 (14)
Non-EL	Grade span 9–12	3 (63)	2 (38)

Table A.10. Speaking Hesitant to Record: Frequency and Percentage of Students Observed in Each Rating Category by EL Status

EL Status	Grade or Grade Span	Not at All	Entirely
EL	TK/K	0 (0)	2 (100)
EL	Grade 1	1 (100)	0 (0)
EL	Grade 2	N/A	N/A
EL	Grade span 3–5	7 (95)	0 (0)
EL	Grade span 6–8	4 (100)	0 (0)
EL	Grade span 9–12	7 (89)	1 (11)
Non-EL	TK/K	2 (88)	< 1 (13)
Non-EL	Grade 1	1 (100)	0 (0)
Non-EL	Grade 2	N/A	N/A
Non-EL	Grade span 3–5	9 (93)	< 1 (7)
Non-EL	Grade span 6–8	4 (100)	0 (0)
Non-EL	Grade span 9–12	4 (88)	< 1 (12)

Table A.11. Writing Domain Student Familiarity with Typing: Frequency and Percentage of Students Observed in Each Rating Category by EL Status

EL Status	Grade or Grade Span	Not at All	Partially	Entirely
EL	Grade span 3–5	0 (0)	2 (31)	6 (69)
EL	Grade span 6–8	0 (0)	1 (25)	2 (75)
EL	Grade span 9–12	1 (5)	0 (0)	10 (95)
Non-EL	Grade span 3–5	2 (15)	9 (65)	3 (19)
Non-EL	Grade span 6–8	0 (0)	0 (0)	5 (100)
Non-EL	Grade span 9–12	1 (8)	0 (0)	6 (92)

Table A.12. Students Needed Technological Assistance: Frequency and Percentage of Students Observed in Each Rating Category by EL Status

EL Status	Domain	Grade or Grade Span	No	Yes
EL	Listening	Grade span 3–5	6 (71)	2 (29)
EL	Listening	Grade span 6–8	3 (71)	1 (29)
EL	Listening	Grade span 9–12	7 (60)	4 (40)
EL	Reading	Grade span 3–5	7 (85)	1 (15)
EL	Reading	Grade span 6–8	3 (100)	0 (0)
EL	Reading	Grade span 9–12	10 (88)	1 (12)
EL	Writing	Grade span 3–5	6 (77)	2 (23)
EL	Writing	Grade span 6–8	3 (100)	0 (0)
EL	Writing	Grade span 9–12	8 (76)	3 (24)
EL	Speaking	Grade span 3–5	7 (95)	0 (5)
EL	Speaking	Grade span 6–8	4 (100)	0 (0)
EL	Speaking	Grade span 9–12	6 (79)	2 (21)
Non-EL	Listening	Grade span 3–5	7 (72)	3 (28)
Non-EL	Listening	Grade span 6–8	2 (43)	2 (57)
Non-EL	Listening	Grade span 9–12	3 (75)	1 (25)
Non-EL	Reading	Grade span 3–5	9 (93)	1 (7)
Non-EL	Reading	Grade span 6–8	2 (75)	1 (25)
Non-EL	Reading	Grade span 9–12	5 (90)	1 (10)
Non-EL	Writing	Grade span 3–5	10 (73)	4 (27)
Non-EL	Writing	Grade span 6–8	5 (92)	< 1 (8)
Non-EL	Writing	Grade span 9–12	5 (75)	2 (25)
Non-EL	Speaking	Grade span 3–5	9 (93)	< 1 (7)
Non-EL	Speaking	Grade span 6–8	3 (82)	1 (18)
Non-EL	Speaking	Grade span 9–12	4 (100)	0 (0)

Table A.13. Students Requested Technological Assistance: Frequency and Percentage of Students Observed in Each Rating Category by EL Status

EL Status	Domain	Grade or Grade Span	No	Yes
EL	Listening	Grade span 3–5	7 (86)	1 (14)
EL	Listening	Grade span 6–8	3 (71)	1 (29)
EL	Listening	Grade span 9–12	11 (100)	0 (0)
EL	Reading	Grade span 3–5	7 (92)	1 (8)
EL	Reading	Grade span 6–8	3 (100)	0 (0)
EL	Reading	Grade span 9–12	11 (100)	0 (0)
EL	Writing	Grade span 3–5	7 (92)	1 (8)
EL	Writing	Grade span 6–8	3 (100)	0 (0)
EL	Writing	Grade span 9–12	11 (100)	0 (0)
EL	Speaking	Grade span 3–5	7 (95)	< 1 (5)
EL	Speaking	Grade span 6–8	4 (100)	0 (0)
EL	Speaking	Grade span 9–12	8 (96)	0 (4)
Non-EL	Listening	Grade span 3–5	9 (89)	1 (11)
Non-EL	Listening	Grade span 6–8	2 (57)	1 (29)
Non-EL	Listening	Grade span 9–12	4 (88)	1 (13)
Non-EL	Reading	Grade span 3–5	9 (93)	1 (7)
Non-EL	Reading	Grade span 6–8	2 (100)	0 (0)
Non-EL	Reading	Grade span 9–12	5 (100)	0 (0)
Non-EL	Writing	Grade span 3–5	13 (92)	1 (8)
Non-EL	Writing	Grade span 6–8	5 (92)	0 (0)
Non-EL	Writing	Grade span 9–12	6 (92)	1 (8)
Non-EL	Speaking	Grade span 3–5	10 (100)	0 (0)
Non-EL	Speaking	Grade span 6–8	4 (100)	0 (0)
Non-EL	Speaking	Grade span 9–12	4 (100)	0 (0)

Table A.14. Students Received Technological Assistance: Frequency and Percentage of Students Observed in Each Rating Category by EL Status

EL Status	Domain	Grade or Grade Span	No	Yes
EL	Listening	Grade span 3–5	2 (21)	6 (79)
EL	Listening	Grade span 6–8	3 (71)	1 (29)
EL	Listening	Grade span 9–12	7 (65)	4 (35)
EL	Reading	Grade span 3–5	5 (62)	3 (39)
EL	Reading	Grade span 6–8	3 (100)	0 (0)
EL	Reading	Grade span 9–12	7 (65)	4 (35)
EL	Writing	Grade span 3–5	4 (46)	5 (54)
EL	Writing	Grade span 6–8	2 (75)	1 (25)
EL	Writing	Grade span 9–12	7 (62)	3 (38)
EL	Speaking	Grade span 3–5	7 (95)	< 1 (5)
EL	Speaking	Grade span 6–8	4 (100)	0 (0)
EL	Speaking	Grade span 9–12	2 (25)	6 (75)
Non-EL	Listening	Grade span 3–5	5 (50)	5 (50)
Non-EL	Listening	Grade span 6–8	1 (29)	3 (72)
Non-EL	Listening	Grade span 9–12	3 (75)	1 (25)
Non-EL	Reading	Grade span 3–5	6 (60)	4 (40)
Non-EL	Reading	Grade span 6–8	1 (50)	1 (50)
Non-EL	Reading	Grade span 9–12	4 (80)	1 (20)
Non-EL	Writing	Grade span 3–5	5 (35)	9 (66)
Non-EL	Writing	Grade span 6–8	3 (67)	2 (34)
Non-EL	Writing	Grade span 9–12	5 (75)	2 (25)
Non-EL	Speaking	Grade span 3–5	10 (95)	< 1 (4)
Non-EL	Speaking	Grade span 6–8	4 (94)	< 1 (6)
Non-EL	Speaking	Grade span 9–12	3 (76)	1 (24)

Table A.15. Students Received Reminders About Accessibility Resources: Frequency and Percentage of Students Observed in Each Rating Category by EL Status

EL Status	Domain	Grade or Grade Span	No	Yes
EL	Listening	Grade span 3–5	6 (79)	2 (21)
EL	Listening	Grade span 6–8	2 (57)	2 (43)
EL	Listening	Grade span 9–12	10 (95)	1 (5)
EL	Reading	Grade span 3–5	6 (69)	3 (31)
EL	Reading	Grade span 6–8	3 (100)	0 (0)
EL	Reading	Grade span 9–12	10 (94)	1 (6)
EL	Writing	Grade span 3–5	6 (77)	2 (23)
EL	Writing	Grade span 6–8	3 (100)	0 (0)
EL	Writing	Grade span 9–12	10 (95)	1 (5)
Non-EL	Listening	Grade span 3–5	8 (78)	2 (22)
Non-EL	Listening	Grade span 6–8	3 (71)	2 (28)
Non-EL	Listening	Grade span 9–12	3 (75)	1 (25)
Non-EL	Reading	Grade span 3–5	7 (73)	3 (27)
Non-EL	Reading	Grade span 6–8	2 (100)	0 (0)
Non-EL	Reading	Grade span 9–12	5 (100)	0 (0)
Non-EL	Writing	Grade span 3–5	9 (62)	5 (38)
Non-EL	Writing	Grade span 6–8	4 (75)	1 (25)
Non-EL	Writing	Grade span 9–12	5 (75)	2 (25)

Table A.16. Students Whose Test Examiners Assisted with the Accessibility Resources: Frequency and Percentage of Students Observed in Each Rating by EL Status

EL Status	Domain	Grade or Grade Span	No	Yes
EL	Listening	Grade span 3–5	7 (86)	1 (14)
EL	Listening	Grade span 6–8	3 (71)	1 (29)
EL	Listening	Grade span 9–12	4 (40)	7 (60)
EL	Reading	Grade span 3–5	6 (77)	2 (23)
EL	Reading	Grade span 6–8	3 (100)	0 (0)
EL	Reading	Grade span 9–12	8 (76)	3 (24)
EL	Writing	Grade span 3–5	7 (92)	1 (8)
EL	Writing	Grade span 6–8	3 (100)	0 (0)
EL	Writing	Grade span 9–12	9 (86)	2 (14)
Non-EL	Listening	Grade span 3–5	8 (83)	2 (17)
Non-EL	Listening	Grade span 6–8	2 (57)	2 (43)
Non-EL	Listening	Grade span 9–12	3 (63)	2 (38)
Non-EL	Reading	Grade span 3–5	8 (80)	2 (20)
Non-EL	Reading	Grade span 6–8	1 (50)	1 (50)
Non-EL	Reading	Grade span 9–12	4 (80)	2 (20)
Non-EL	Writing	Grade span 3–5	9 (65)	5 (35)
Non-EL	Writing	Grade span 6–8	3 (58)	2 (42)
Non-EL	Writing	Grade span 9–12	5 (75)	2 (25)

Table A.17. Clarity of the *Directions for Administration (DFA)* for Test Examiners: Frequency and Percentage of Test Administrations Observed in Each Rating Category by EL Status

EL Status	Domain	Grade or Grade Span	Not at All	Partially	Entirely
EL	Listening	TK/K	1 (50)	0 (0)	1 (50)
EL	Listening	Grade 1	0 (0)	0 (0)	1 (100)
EL	Listening	Grade 2	N/A	N/A	N/A
EL	Listening	Grade span 3–5	1 (7)	2 (29)	5 (64)
EL	Listening	Grade span 6–8	0 (0)	0 (0)	4 (100)
EL	Listening	Grade span 9–12	2 (20)	1 (10)	8 (70)
EL	Reading	TK/K	1 (50)	0 (0)	1 (50)
EL	Reading	Grade 1	0 (0)	0 (0)	1 (100)
EL	Reading	Grade 2	N/A	N/A	N/A
EL	Reading	Grade span 3–5	1 (15)	1 (15)	6 (69)
EL	Reading	Grade span 6–8	0 (0)	0 (0)	3 (100)
EL	Reading	Grade span 9–12	2 (18)	0 (0)	9 (82)
EL	Writing	Grade span 3–5	1 (8)	0 (0)	7 (92)
EL	Writing	Grade span 6–8	2 (42)	0 (0)	3 (58)
EL	Writing	Grade span 9–12	0 (0)	2 (14)	9 (86)
EL	Speaking	TK/K	0 (0)	2 (100)	0 (0)
EL	Speaking	Grade 1	0 (0)	0 (0)	1 (100)
EL	Speaking	Grade 2	N/A	N/A	N/A
EL	Speaking	Grade span 3–5	1 (9)	1 (18)	5 (73)
EL	Speaking	Grade span 6–8	0 (0)	3 (64)	1 (36)
EL	Speaking	Grade span 9–12	0 (0)	3 (36)	5 (64)
Non-EL	Listening	K	0 (0)	0 (0)	2 (100)
Non-EL	Listening	Grade 1	0 (0)	0 (0)	1 (100)
Non-EL	Listening	Grade 2	N/A	N/A	N/A
Non-EL	Listening	Grade span 3–5	0 (0)	0 (0)	10 (100)
Non-EL	Listening	Grade span 6–8	0 (0)	0 (0)	4 (100)
Non-EL	Listening	Grade span 9–12	0 (0)	0 (0)	1 (100)
Non-EL	Reading	K	1 (25)	0 (0)	3 (75)
Non-EL	Reading	Grade 1	2 (33)	< 1 (7)	4 (60)
Non-EL	Reading	Grade 2	0 (0)	0 (0)	3 (100)
Non-EL	Reading	Grade span 3–5	0 (0)	1 (7)	9 (93)
Non-EL	Reading	Grade span 6–8	0 (0)	1 (50)	1 (50)
Non-EL	Reading	Grade span 9–12	1 (20)	1 (10)	4 (70)

Table A.17 *(continuation)*

EL Status	Domain	Grade or Grade Span	Not at All	Partially	Entirely
Non-EL	Writing	Grade span 3–5	5 (38)	1 (4)	8 (58)
Non-EL	Writing	Grade span 6–8	2 (42)	0 (0)	3 (58)
Non-EL	Writing	Grade span 9–12	2 (25)	1 (8)	4 (67)
Non-EL	Speaking	TK/K	0 (0)	1 (63)	1 (38)
Non-EL	Speaking	Grade 1	0 (0)	0 (0)	1 (100)
Non-EL	Speaking	Grade 2	N/A	N/A	N/A
Non-EL	Speaking	Grade span 3–5	1 (11)	3 (30)	6 (59)
Non-EL	Speaking	Grade span 6–8	< 1 (12)	2 (41)	2 (47)
Non-EL	Speaking	Grade span 9–12	0 (0)	3 (82)	1 (18)

Appendix B: EL Status by Disability Student Groups

Note: In table B.1 through table B.17

- K = kindergarten,
- TK = transitional kindergarten,
- BLV = blind or low vision,
- DHH = deaf or hard of hearing, and
- N/A indicates that no data was collected for the domain.

Refer to section 6 for a description of data missingness and rounding procedures, and suggestions for interpreting the weighted means.

Table B.1. Listening Domain Understanding Directions: Frequency and Percentage of EL Students Observed in Each Rating Category by Disability Category

EL Status	Disability Category	Grade or Grade Span	Not at All	Partially	Entirely
EL	BLV	TK/K	0 (0)	0 (0)	1 (100)
EL	BLV	Grade 1	N/A	N/A	N/A
EL	BLV	Grade 2	N/A	N/A	N/A
EL	BLV	Grade span 3–5	1 (20)	1 (40)	1 (40)
EL	BLV	Grade span 6–8	0 (0)	1 (100)	0 (0)
EL	BLV	Grade span 9–12	0 (0)	2 (30)	4 (70)
EL	DHH	TK/K	0 (0)	0 (0)	1 (100)
EL	DHH	Grade 1	1 (100)	0 (0)	0 (0)
EL	DHH	Grade 2	N/A	N/A	N/A
EL	DHH	Grade span 3–5	0 (0)	1 (11)	4 (89)
EL	DHH	Grade span 6–8	0 (0)	1 (20)	2 (80)
EL	DHH	Grade span 9–12	0 (0)	2 (40)	3 (60)

Table B.2. Reading Domain Understanding Directions: Frequency and Percentage of EL Students Observed in Each Rating Category by Disability Category

EL Status	Disability Category	Grade or Grade Span	Not at All	Partially	Entirely
EL	BLV	TK/K	0 (0)	0 (0)	1 (100)
EL	BLV	Grade 1	N/A	N/A	N/A
EL	BLV	Grade 2	N/A	N/A	N/A
EL	BLV	Grade span 3–5	1 (25)	2 (50)	1 (25)
EL	BLV	Grade span 6–8	N/A	N/A	N/A
EL	BLV	Grade span 9–12	0 (0)	2 (25)	5 (75)
EL	DHH	TK/K	0 (0)	0 (0)	1 (100)
EL	DHH	Grade 1	1 (100)	0 (0)	0 (0)
EL	DHH	Grade 2	N/A	N/A	N/A
EL	DHH	Grade span 3–5	0 (0)	0 (0)	5 (100)
EL	DHH	Grade span 6–8	0 (0)	0 (0)	2 (100)
EL	DHH	Grade span 9–12	0 (0)	0 (0)	5 (100)

Table B.3. Writing Domain Understanding Directions: Frequency and Percentage of EL Students Observed in Each Rating Category by Disability Category

EL Status	Disability Category	Grade or Grade Span	Not at All	Partially	Entirely
EL	BLV	Grade span 3–5	2 (67)	0 (0)	1 (33)
EL	BLV	Grade span 6–8	N/A	N/A	N/A
EL	BLV	Grade span 9–12	0 (0)	2 (30)	4 (70)
EL	DHH	Grade span 3–5	1 (10)	1 (20)	4 (70)
EL	DHH	Grade span 6–8	0 (0)	1 (25)	2 (75)
EL	DHH	Grade span 9–12	0 (0)	2 (45)	3 (55)

Table B.4. Speaking Domain Understanding Directions: Frequency and Percentage of EL Students Observed in Each Rating Category by Disability Category

EL Status	Disability Category	Grade or Grade Span	Not at All	Partially	Entirely
EL	BLV	TK/K	N/A	N/A	N/A
EL	BLV	Grade 1	N/A	N/A	N/A
EL	BLV	Grade 2	N/A	N/A	N/A
EL	BLV	Grade span 3–5	0 (0)	0 (0)	2 (100)
EL	BLV	Grade span 6–8	0 (0)	0 (0)	1 (100)
EL	BLV	Grade span 9–12	0 (0)	0 (8)	5 (95)
EL	DHH	TK/K	0 (0)	0 (0)	1 (100)
EL	DHH	Grade 1	0 (0)	< 1 (25)	1 (75)
EL	DHH	Grade 2	N/A	N/A	N/A
EL	DHH	Grade span 3–5	0 (0)	<1 (5)	5 (95)
EL	DHH	Grade span 6–8	0 (0)	0 (0)	3 (100)
EL	DHH	Grade span 9–12	< 1 (13)	0 (0)	3 (87)

Table B.5. Understanding Layout of the Listening Domain: Frequency and Percentage of EL Students Observed in Each Rating Category by Disability Category

EL Status	Disability Category	Grade or Grade Span	Not at All	Partially	Entirely
EL	BLV	Grade span 3–5	1 (20)	2 (80)	0 (0)
EL	BLV	Grade span 6–8	0 (0)	0 (0)	1 (100)
EL	BLV	Grade span 9–12	0 (0)	2 (30)	4 (70)
EL	DHH	Grade span 3–5	0 (0)	1 (22)	4 (78)
EL	DHH	Grade span 6–8	0 (0)	0 (0)	3 (100)
EL	DHH	Grade span 9–12	1 (10)	0 (0)	5 (90)

Table B.6. Understanding Layout of the Reading Domain: Frequency and Percentage of EL Students Observed in Each Rating Category by Disability Category

EL Status	Disability Category	Grade or Grade Span	Not at All	Partially	Entirely
EL	BLV	Grade span 3–5	1 (25)	2 (50)	1 (25)
EL	BLV	Grade span 6–8	N/A	N/A	N/A
EL	BLV	Grade span 9–12	0 (0)	2 (25)	5 (75)
EL	DHH	Grade span 3–5	0 (0)	0 (0)	5 (100)
EL	DHH	Grade span 6–8	0 (0)	0 (0)	2 (100)
EL	DHH	Grade span 9–12	0 (0)	0 (0)	5 (100)

Table B.7. Understanding Layout of the Writing Domain: Frequency and Percentage of EL Students Observed in Each Rating Category by Disability Category

EL Status	Disability Category	Grade or Grade Span	Not at All	Partially	Entirely
EL	BLV	Grade span 3–5	2 (67)	1 (33)	0 (0)
EL	BLV	Grade span 6–8	N/A	N/A	N/A
EL	BLV	Grade span 9–12	1 (10)	2 (40)	3 (50)
EL	DHH	Grade span 3–5	1 (10)	1 (10)	4 (80)
EL	DHH	Grade span 6–8	1 (25)	0 (0)	2 (75)
EL	DHH	Grade span 9–12	0 (0)	0 (0)	5 (100)

Table B.8. Students Answering Independently: Frequency and Percentage of EL Students Observed in Each Rating Category by Disability Category

EL Status	Disability Category	Domain	Grade or Grade Span	Not at All	Partially	Entirely
EL	BLV	Listening	Grade span 3–5	1 (40)	1 (20)	1 (40)
EL	BLV	Listening	Grade span 6–8	0 (0)	0 (0)	1 (100)
EL	BLV	Listening	Grade span 9–12	0 (0)	2 (30)	4 (70)
EL	BLV	Reading	Grade span 3–5	2 (50)	0 (0)	2 (50)
EL	BLV	Reading	Grade span 6–8	N/A	N/A	N/A
EL	BLV	Reading	Grade span 9–12	0 (0)	0 (0)	6 (100)
EL	BLV	Writing	Grade span 3–5	0 (0)	2 (67)	1 (33)
EL	BLV	Writing	Grade span 6–8	N/A	N/A	N/A
EL	BLV	Writing	Grade span 9–12	0 (0)	1 (10)	5 (90)
EL	BLV	Speaking	Grade span 3–5	0 (0)	0 (0)	2 (100)
EL	BLV	Speaking	Grade span 6–8	0 (0)	0 (0)	1 (100)
EL	BLV	Speaking	Grade span 9–12	1 (23)	< 1 (8)	3 (69)
EL	DHH	Listening	Grade span 3–5	0 (0)	1 (11)	4 (89)
EL	DHH	Listening	Grade span 6–8	0 (0)	0 (0)	3 (100)
EL	DHH	Listening	Grade span 9–12	0 (0)	1 (20)	4 (80)
EL	DHH	Reading	Grade span 3–5	0 (0)	0 (0)	5 (100)
EL	DHH	Reading	Grade span 6–8	0 (0)	0 (0)	2 (100)
EL	DHH	Reading	Grade span 9–12	0 (0)	0 (0)	5 (100)
EL	DHH	Writing	Grade span 3–5	0 (0)	0 (0)	5 (100)
EL	DHH	Writing	Grade span 6–8	1 (25)	0 (0)	2 (75)
EL	DHH	Writing	Grade span 9–12	0 (0)	0 (0)	5 (100)
EL	DHH	Speaking	Grade span 3–5	1 (10)	0 (0)	5 (90)
EL	DHH	Speaking	Grade span 6–8	3 (100)	0 (0)	0 (0)
EL	DHH	Speaking	Grade span 9–12	1 (33)	0 (0)	2 (67)

Table B.9. Needing Assistance with the Listening Domain Audio File: Frequency and Percentage of EL Students Observed in Each Rating Category by Disability Category

EL Status	Disability Category	Grade or Grade Span	Not at All	Entirely
EL	BLV	Grade span 3–5	2 (80)	1 (20)
EL	BLV	Grade span 6–8	0 (0)	1 (100)
EL	BLV	Grade span 9–12	4 (60)	2 (40)
EL	DHH	Grade span 3–5	4 (89)	1 (11)
EL	DHH	Grade span 6–8	2 (80)	1 (20)
EL	DHH	Grade span 9–12	4 (70)	2 (30)

Table B.10. Speaking Hesitant to Record: Frequency and Percentage of EL Students Observed in Each Rating Category by Disability Category

EL Status	Disability Category	Grade or Grade Span	Not at All	Entirely
EL	BLV	TK/K	N/A	N/A
EL	BLV	Grade 1	1 (100)	0 (0)
EL	BLV	Grade 2	N/A	N/A
EL	BLV	Grade span 3–5	2 (100)	0 (0)
EL	BLV	Grade span 6–8	1 (100)	0 (0)
EL	BLV	Grade span 9–12	4 (77)	1 (23)
EL	DHH	TK/K	1 (100)	0 (0)
EL	DHH	Grade 1	1 (100)	0 (0)
EL	DHH	Grade 2	N/A	N/A
EL	DHH	Grade span 3–5	5 (95)	< 1 (5)
EL	DHH	Grade span 6–8	3 (100)	0 (0)
EL	DHH	Grade span 9–12	3 (100)	0 (0)

Table B.11. Writing Domain Student Familiarity with Typing: Frequency and Percentage of EL Students Observed in Each Rating Category by Disability Category

EL Status	Disability Category	Grade or Grade Span	Not at All	Partially	Entirely
EL	BLV	Grade span 3–5	0 (0)	1 (33)	2 (67)
EL	BLV	Grade span 6–8	N/A	N/A	N/A
EL	BLV	Grade span 9–12	1 (10)	0 (0)	5 (90)
EL	DHH	Grade span 3–5	0 (0)	2 (30)	4 (70)
EL	DHH	Grade span 6–8	0 (0)	1 (25)	2 (75)
EL	DHH	Grade span 9–12	0 (0)	0 (0)	5 (100)

Table B.12. Students Needed Technological Assistance: Frequency and Percentage of EL Students Observed in Each Rating Category by Disability Category

EL Status	Disability Category	Domain	Grade or Grade Span	No	Yes
EL	BLV	Listening	Grade span 3–5	1 (40)	2 (60)
EL	BLV	Listening	Grade span 6–8	0 (0)	1 (100)
EL	BLV	Listening	Grade span 9–12	2 (40)	4 (60)
EL	BLV	Reading	Grade span 3–5	2 (50)	2 (50)
EL	BLV	Reading	Grade span 6–8	N/A	N/A
EL	BLV	Reading	Grade span 9–12	5 (78)	1 (22)
EL	BLV	Writing	Grade span 3–5	1 (33)	2 (66)
EL	BLV	Writing	Grade span 6–8	N/A	N/A
EL	BLV	Writing	Grade span 9–12	4 (60)	2 (40)
EL	BLV	Speaking	Grade span 3–5	1 (50)	1 (50)
EL	BLV	Speaking	Grade span 6–8	1 (100)	0 (0)
EL	BLV	Speaking	Grade span 9–12	3 (54)	2 (46)
EL	DHH	Listening	Grade span 3–5	4 (89)	1 (11)
EL	DHH	Listening	Grade span 6–8	3 (100	0 (0)
EL	DHH	Listening	Grade span 9–12	4 (80)	1 (20)
EL	DHH	Reading	Grade span 3–5	5 (100)	0 (0)
EL	DHH	Reading	Grade span 6–8	2 (100)	0 (0)
EL	DHH	Reading	Grade span 9–12	5 (100)	0 (0)
EL	DHH	Writing	Grade span 3–5	5 (90)	1 (10)
EL	DHH	Writing	Grade span 6–8	2 (100)	0 (0)
EL	DHH	Writing	Grade span 9–12	5 (91)	< 1 (9)
EL	DHH	Speaking	Grade span 3–5	5 (100)	0 (0)
EL	DHH	Speaking	Grade span 6–8	3 (100)	0 (0)
EL	DHH	Speaking	Grade span 9–12	3 (100)	0 (0)

Table B.13. Students Requested Technological Assistance: Frequency and Percentage of EL Students Observed in Each Rating Category by Disability Category

EL Status	Disability Category	Domain	Grade or Grade Span	No	Yes
EL	BLV	Listening	Grade span 3–5	2 (60)	1 (40)
EL	BLV	Listening	Grade span 6–8	0 (0)	1 (100)
EL	BLV	Listening	Grade span 9–12	6 (100)	0 (0)
EL	BLV	Reading	Grade span 3–5	2 (75)	1 (25)
EL	BLV	Reading	Grade span 6–8	N/A	N/A
EL	BLV	Reading	Grade span 9–12	6 (100)	0 (0)
EL	BLV	Writing	Grade span 3–5	2 (67)	1 (33)
EL	BLV	Writing	Grade span 6–8	N/A	N/A
EL	BLV	Writing	Grade span 9–12	6 (100)	0 (0)
EL	BLV	Speaking	Grade span 3–5	1 (50)	1 (50)
EL	BLV	Speaking	Grade span 6–8	1 (100)	0 (0)
EL	BLV	Speaking	Grade span 9–12	5 (92)	< 1 (8)
EL	DHH	Listening	Grade span 3–5	5 (100)	0 (0)
EL	DHH	Listening	Grade span 6–8	3 (100)	0 (0)
EL	DHH	Listening	Grade span 9–12	5 (100)	0 (0)
EL	DHH	Reading	Grade span 3–5	5 (100)	0 (0)
EL	DHH	Reading	Grade span 6–8	2 (100)	0 (0)
EL	DHH	Reading	Grade span 9–12	5 (100)	0 (0)
EL	DHH	Writing	Grade span 3–5	5 (100)	0 (0)
EL	DHH	Writing	Grade span 6–8	2 (100)	0 (0)
EL	DHH	Writing	Grade span 9–12	5 (91)	< 1 (9)
EL	DHH	Speaking	Grade span 3–5	5 (100)	0 (0)
EL	DHH	Speaking	Grade span 6–8	3 (100)	0 (0)
EL	DHH	Speaking	Grade span 9–12	3 (100)	0 (0)

Table B.14. Students Received Technological Assistance: Frequency and Percentage of EL Students Observed in Each Rating Category by Disability Category

EL Status	Disability Category	Domain	Grade or Grade Span	No	Yes
EL	BLV	Listening	Grade span 3–5	1 (20)	2 (80)
EL	BLV	Listening	Grade span 6–8	0 (0)	1 (100)
EL	BLV	Listening	Grade span 9–12	4 (60)	2 (40)
EL	BLV	Reading	Grade span 3–5	2 (50)	2 (50)
EL	BLV	Reading	Grade span 6–8	N/A	N/A
EL	BLV	Reading	Grade span 9–12	2 (33)	4 (67)
EL	BLV	Writing	Grade span 3–5	0 (0)	3 (100)
EL	BLV	Writing	Grade span 6–8	N/A	N/A
EL	BLV	Writing	Grade span 9–12	2 (3)	4 (70)
EL	BLV	Speaking	Grade span 3–5	2 (100)	0 (0)
EL	BLV	Speaking	Grade span 6–8	1 (100)	0 (0)
EL	BLV	Speaking	Grade span 9–12	1 (15)	4 (85)
EL	DHH	Listening	Grade span 3–5	1 (22)	4 (78)
EL	DHH	Listening	Grade span 6–8	3 (100)	0 (0)
EL	DHH	Listening	Grade span 9–12	4 (70)	2 (30)
EL	DHH	Reading	Grade span 3–5	3 (67)	2 (33)
EL	DHH	Reading	Grade span 6–8	2 (100)	0 (0)
EL	DHH	Reading	Grade span 9–12	5 (100)	0 (0)
EL	DHH	Writing	Grade span 3–5	3 (60)	3 (40)
EL	DHH	Writing	Grade span 6–8	2 (75)	1 (25)
EL	DHH	Writing	Grade span 9–12	5 (91)	0 (9)
EL	DHH	Speaking	Grade span 3–5	5 (95)	< 1 (5)
EL	DHH	Speaking	Grade span 6–8	3 (100)	0 (0)
EL	DHH	Speaking	Grade span 9–12	1 (33)	2 (67)

Table B.15. Students Received Reminders About Accessibility Resources: Frequency and Percentage of EL Students Observed in Each Rating Category by Disability Category

EL Status	Disability Category	Domain	Grade or Grade Span	No	Yes
EL	BLV	Listening	Grade span 3–5	2 (80)	1 (20)
EL	BLV	Listening	Grade span 6–8	0 (0)	1 (100)
EL	BLV	Listening	Grade span 9–12	6 (100)	0 (0)
EL	BLV	Reading	Grade span 3–5	2 (75)	1 (25)
EL	BLV	Reading	Grade span 6–8	N/A	N/A
EL	BLV	Reading	Grade span 9–12	6 (100)	0 (0)
EL	BLV	Writing	Grade span 3–5	2 (67)	1 (33)
EL	BLV	Writing	Grade span 6–8	N/A	N/A
EL	BLV	Writing	Grade span 9–12	5 (90)	1 (10)
EL	DHH	Listening	Grade span 3–5	4 (78)	2 (22)
EL	DHH	Listening	Grade span 6–8	2 (80)	1 (20)
EL	DHH	Listening	Grade span 9–12	5 (90)	1 (10)
EL	DHH	Reading	Grade span 3–5	3 (67)	2 (33)
EL	DHH	Reading	Grade span 6–8	2 (100)	0 (0)
EL	DHH	Reading	Grade span 9–12	4 (88)	1 (13)
EL	DHH	Writing	Grade span 3–5	4 (80)	1 (20)
EL	DHH	Writing	Grade span 6–8	2 (100)	0 (0)
EL	DHH	Writing	Grade span 9–12	5(100)	0 (0)

Table B.16. Students Whose Test Examiners Assisted with the Accessibility Resources: Frequency and Percentage of EL Students Observed in Each Rating by Disability Category

EL Status	Disability Category	Domain	Grade or Grade Span	No	Yes
EL	BLV	Listening	Grade span 3–5	2 (80)	1 (20)
EL	BLV	Listening	Grade span 6–8	0 (0)	1 (100)
EL	BLV	Listening	Grade span 9–12	1 (20)	5 (80)
EL	BLV	Reading	Grade span 3–5	2 (50)	2 (50)
EL	BLV	Reading	Grade span 6–8	N/A	N/A
EL	BLV	Reading	Grade span 9–12	4 (67)	2 (33)
EL	BLV	Writing	Grade span 3–5	3 (100)	0 (0)
EL	BLV	Writing	Grade span 6–8	N/A	N/A
EL	BLV	Writing	Grade span 9–12	5 (90)	1 (10)
EL	DHH	Listening	Grade span 3–5	4 (89)	1 (11)
EL	DHH	Listening	Grade span 6–8	3 (100)	0 (0)
EL	DHH	Listening	Grade span 9–12	3 (60)	2 (40)
EL	DHH	Reading	Grade span 3–5	4 (89)	1 (11)
EL	DHH	Reading	Grade span 6–8	2 (100)	0 (0)
EL	DHH	Reading	Grade span 9–12	4 (88)	1 (13)
EL	DHH	Writing	Grade span 3–5	5 (90)	1 (10)
EL	DHH	Writing	Grade span 6–8	2 (100)	0 (0)
EL	DHH	Writing	Grade span 9–12	4 (82)	1 (18)

Table B.17. Clarity of the *DFA* for Test Examiners: Frequency and Percentage of Test Administrations Observed in Each Rating Category for EL Students by Disability Category

EL Status	Disability Category	Domain	Grade or Grade Span	Not at All	Partially	Entirely
EL	BLV	Listening	K	1 (100)	0 (0)	0 (0)
EL	BLV	Listening	Grade 1	N/A	N/A	N/A
EL	BLV	Listening	Grade 2	N/A	N/A	N/A
EL	BLV	Listening	Grade span 3–5	1 (20)	2 (60)	1 (20)
EL	BLV	Listening	Grade span 6–8	0 (0)	0 (0)	1 (100)
EL	BLV	Listening	Grade span 9–12	0 (0)	1 (20)	5 (80)
EL	BLV	Reading	K	1 (100)	0 (0)	0 (0)
EL	BLV	Reading	Grade 1	N/A	N/A	N/A
EL	BLV	Reading	Grade 2	N/A	N/A	N/A
EL	BLV	Reading	Grade span 3–5	1 (25)	0 (0)	2 (75)
EL	BLV	Reading	Grade span 6–8	N/A	N/A	N/A
EL	BLV	Reading	Grade span 9–12	1 (11)	0 (0)	5 (89)
EL	BLV	Writing	Grade span 3–5	1 (33)	0 (0)	2 (67)
EL	BLV	Writing	Grade span 6–8	N/A	N/A	N/A
EL	BLV	Writing	Grade span 9–12	0 (0)	0 (0)	6 (100)
EL	BLV	Speaking	TK/K	N/A	N/A	N/A
EL	BLV	Speaking	Grade 1	N/A	N/A	N/A
EL	BLV	Speaking	Grade 2	N/A	N/A	N/A
EL	BLV	Speaking	Grade span 3–5	0 (0)	2 (100)	0 (0)
EL	BLV	Speaking	Grade span 6–8	0 (0)	0 (0)	1 (100)
EL	BLV	Speaking	Grade span 9–12	0 (0)	2 (38)	3 (62)
EL	DHH	Listening	K	0 (0)	0 (0)	1 (100)
EL	DHH	Listening	Grade 1	0 (0)	0 (0)	1 (100)
EL	DHH	Listening	Grade 2	N/A	N/A	N/A
EL	DHH	Listening	Grade span 3–5	0 (0)	1 (11)	4 (89)
EL	DHH	Listening	Grade span 6–8	0 (0)	0 (0)	3 (100)
EL	DHH	Listening	Grade span 9–12	2 (40)	0 (0)	3 (60)
EL	DHH	Reading	K	0 (0)	0 (0)	1 (100)
EL	DHH	Reading	Grade 1	0 (0)	0 (0)	1 (100)
EL	DHH	Reading	Grade 2	N/A	N/A	N/A
EL	DHH	Reading	Grade span 3–5	1 (11)	1 (22)	3 (67)
EL	DHH	Reading	Grade span 6–8	0 (0)	0 (0)	2 (100)
EL	DHH	Reading	Grade span 9–12	1 (25)	0 (0)	4 (75)

Table B.17 *(continuation)*

EL Status	Disability Category	Domain	Grade or Grade Span	Not at All	Partially	Entirely
EL	DHH	Writing	Grade span 3–5	0 (0)	0 (0)	5 (100)
EL	DHH	Writing	Grade span 6–8	0 (0)	0 (0)	2 (100)
EL	DHH	Writing	Grade span 9–12	0 (0)	1 (27)	4 (73)
EL	DHH	Speaking	TK/K	0 (0)	1 (100)	0 (0)
EL	DHH	Speaking	Grade 1	0 (0)	0 (0)	1 (100)
EL	DHH	Speaking	Grade 2	N/A	N/A	N/A
EL	DHH	Speaking	Grade span 3–5	1 (10)	1 (10)	4 (80)
EL	DHH	Speaking	Grade span 6–8	0 (0)	3 (100)	0 (0)
EL	DHH	Speaking	Grade span 9–12	0 (0)	1 (33)	2 (67)

Appendix C: Non-EL Status and Disability Student Groups

Note: In table C.1 through table C.17

- K = kindergarten,
- TK = transitional kindergarten,
- BLV = blind or low vision,
- DHH = deaf or hard of hearing, and
- N/A indicates that no data was collected for the domain.

Refer to section 6 for a description of data missingness and rounding procedures, and suggestions for interpreting the weighted means.

Table C.1. Listening Domain Understanding Directions: Frequency and Percentage of EL Students Observed in Each Rating Category by Disability Category

EL Status	Disability Category	Grade or Grade Span	Not at All	Partially	Entirely
Non-EL	BLV	TK/K	N/A	N/A	N/A
Non-EL	BLV	Grade 1	0 (0)	1 (50)	1 (50)
Non-EL	BLV	Grade 2	N/A	N/A	N/A
Non-EL	BLV	Grade span 3–5	0 (0)	1 (33)	1 (67)
Non-EL	BLV	Grade span 6–8	0 (0)	0 (0)	1 (100)
Non-EL	BLV	Grade span 9–12	0 (0)	1 (50)	1 (50)
Non-EL	DHH	TK/K	0 (0)	0 (0)	2 (100)
Non-EL	DHH	Grade 1	N/A	N/A	N/A
Non-EL	DHH	Grade 2	N/A	N/A	N/A
Non-EL	DHH	Grade span 3–5	0 (0)	1 (7)	7 (93)
Non-EL	DHH	Grade span 6–8	0 (0)	0 (0)	3 (100)
Non-EL	DHH	Grade span 9–12	0 (0)	0 (0)	3 (100)

Table C.2. Reading Domain Understanding Directions: Frequency and Percentage of EL Students Observed in Each Rating Category by Disability Category

EL Status	Disability Category	Grade or Grade Span	Not at All	Partially	Entirely
Non-EL	BLV	TK/K	N/A	N/A	N/A
Non-EL	BLV	Grade 1	N/A	N/A	N/A
Non-EL	BLV	Grade 2	N/A	N/A	N/A
Non-EL	BLV	Grade span 3–5	0 (0)	2 (100)	0 (0)
Non-EL	BLV	Grade span 6–8	0 (0)	0 (0)	1 (100)
Non-EL	BLV	Grade span 9–12	0 (0)	1 (50)	1 (50)
Non-EL	DHH	TK/K	0 (0)	1 (25)	3 (75)
Non-EL	DHH	Grade 1	0 (0)	2 (27)	4 (73)
Non-EL	DHH	Grade 2	0 (0)	0 (0)	3 (100)
Non-EL	DHH	Grade span 3–5	0 (0)	2 (21)	6 (79)
Non-EL	DHH	Grade span 6–8	0 (0)	0 (0)	1 (100)
Non-EL	DHH	Grade span 9–12	0 (0)	0 (0)	4 (100)

Table C.3. Writing Domain Understanding Directions: Frequency and Percentage of EL Students Observed in Each Rating Category by Disability Category

EL Status	Disability Category	Grade or Grade Span	Not at All	Partially	Entirely
Non-EL	BLV	Grade span 3–5	2 (100)	0 (0)	0 (0)
Non-EL	BLV	Grade span 6–8	N/A	N/A	N/A
Non-EL	BLV	Grade span 9–12	0 (0)	0 (0)	1 (100)
Non-EL	DHH	Grade span 3–5	4 (36)	4 (36)	3 (28)
Non-EL	DHH	Grade span 6–8	0 (0)	3 (50)	3 (50)
Non-EL	DHH	Grade span 9–12	2 (33)	0 (0)	3 (67)

Table C.4. Speaking Domain Understanding Directions: Frequency and Percentage of EL Students Observed in Each Rating Category by Disability Category

EL Status	Disability Category	Grade or Grade Span	Not at All	Partially	Entirely
Non-EL	BLV	TK/K	N/A	N/A	N/A
Non-EL	BLV	Grade 1	0 (0)	< 1 (25)	1 (75)
Non-EL	BLV	Grade 2	N/A	N/A	N/A
Non-EL	BLV	Grade span 3–5	< 1 (11)	0 (0)	2 (89)
Non-EL	BLV	Grade span 6–8	0 (0)	0 (0)	1 (100)
Non-EL	BLV	Grade span 9–12	0 (0)	< 1 (40)	1 (60)
Non-EL	DHH	TK/K	0 (0)	< 1 (13)	2 (88)
Non-EL	DHH	Grade 1	N/A	N/A	N/A
Non-EL	DHH	Grade 2	N/A	N/A	N/A
Non-EL	DHH	Grade span 3–5	0 (0)	1 (11)	7 (89)
Non-EL	DHH	Grade span 6–8	0 (0)	0 (0)	3 (100)
Non-EL	DHH	Grade span 9–12	0 (0)	0 (0)	3 (83)

Table C.5. Understanding Layout of the Listening Domain: Frequency and Percentage of EL Students Observed in Each Rating Category by Disability Category

EL Status	Disability Category	Grade or Grade Span	Not at All	Partially	Entirely
Non-EL	BLV	Grade span 3–5	0 (0)	0 (0)	2 (100)
Non-EL	BLV	Grade span 6–8	0 (0)	0 (0)	1 (100)
Non-EL	BLV	Grade span 9–12	0 (0)	0 (0)	1 (100)
Non-EL	DHH	Grade span 3–5	1 (7)	2 (20)	6 (73)
Non-EL	DHH	Grade span 6–8	0 (0)	0 (0)	3 (100)
Non-EL	DHH	Grade span 9–12	0 (0)	0 (0)	3 (100)

Table C.6. Understanding Layout of the Reading Domain: Frequency and Percentage of EL Students Observed in Each Rating Category by Disability Category

EL Status	Disability Category	Grade or Grade Span	Not at All	Partially	Entirely
Non-EL	BLV	Grade span 3–5	0 (0)	0 (0)	2 (100)
Non-EL	BLV	Grade span 6–8	0 (0)	1 (50)	1 (50)
Non-EL	BLV	Grade span 9–12	0 (0)	1 (50)	1 (50)
Non-EL	DHH	Grade span 3–5	0 (0)	1 (7)	7 (93)
Non-EL	DHH	Grade span 6–8	0 (0)	0 (0)	1 (100)
Non-EL	DHH	Grade span 9–12	0 (0)	0 (0)	4 (100)

Table C.7. Understanding Layout of the Writing Domain: Frequency and Percentage of EL Students Observed in Each Rating Category by Disability Category

EL Status	Disability Category	Grade or Grade Span	Not at All	Partially	Entirely
Non-EL	BLV	Grade span 3–5	2 (100)	0 (0)	0 (0)
Non-EL	BLV	Grade span 6–8	N/A	N/A	N/A
Non-EL	BLV	Grade span 9–12	0 (0)	1 (67)	< 1 (33)
Non-EL	DHH	Grade span 3–5	2 (20)	0 (4)	9 (76)
Non-EL	DHH	Grade span 6–8	< 1 (8)	0 (0)	5 (92)
Non-EL	DHH	Grade span 9–12	0 (0)	1 (11)	4 (78)

Table C.8. Students Answering Independently: Frequency and Percentage of Non-EL Students Observed in Each Rating Category by Disability Category

EL Status	Disability Category	Domain	Grade or Grade Span	Not at All	Partially	Entirely
Non-EL	BLV	Listening	Grade span 3–5	0 (0)	1 (33)	1 (67)
Non-EL	BLV	Listening	Grade span 6–8	0 (0)	1 (50)	1 (50)
Non-EL	BLV	Listening	Grade span 9–12	0 (0)	1 (50)	1 (50)
Non-EL	BLV	Reading	Grade span 3–5	0 (0)	2 (100)	0 (0)
Non-EL	BLV	Reading	Grade span 6–8	1 (50)	0 (0)	1 (50)
Non-EL	BLV	Reading	Grade span 9–12	0 (0)	1 (100)	0 (0)
Non-EL	BLV	Writing	Grade span 3–5	< 1 (4)	2 (16)	10 (80)
Non-EL	BLV	Writing	Grade span 6–8	N/A	N/A	N/A
Non-EL	BLV	Writing	Grade span 9–12	< 1 (33)	1 (67)	0 (0)
Non-EL	BLV	Speaking	Grade span 3–5	0 (22)	< 1 (11)	1 (67)
Non-EL	BLV	Speaking	Grade span 6–8	0 (0)	< 1 (40)	1 (60)
Non-EL	BLV	Speaking	Grade span 9–12	0 (0)	1 (60)	0 (40)
Non-EL	DHH	Listening	Grade span 3–5	0 (0)	0 (0)	8 (100)
Non-EL	DHH	Listening	Grade span 6–8	0 (0)	0 (0)	3 (100)
Non-EL	DHH	Listening	Grade span 9–12	0 (0)	0 (0)	3 (100)
Non-EL	DHH	Reading	Grade span 3–5	0 (0)	0 (0)	8 (100)
Non-EL	DHH	Reading	Grade span 6–8	0 (0)	0 (0)	1 (100)
Non-EL	DHH	Reading	Grade span 9–12	0 (0)	0 (0)	4 (100)
Non-EL	DHH	Writing	Grade span 3–5	2 (100)	0 (0)	0 (0)
Non-EL	DHH	Writing	Grade span 6–8	< 1 (8)	0 (0)	5 (92)
Non-EL	DHH	Writing	Grade span 9–12	1 (11)	1 (11)	4 (78)
Non-EL	DHH	Speaking	Grade span 3–5	2 (20)	< 1 (3)	6 (77)
Non-EL	DHH	Speaking	Grade span 6–8	1 (17)	1 (42)	1 (42)
Non-EL	DHH	Speaking	Grade span 9–12	3 (100)	0 (0)	0 (0)

Table C.9. Needing Assistance with the Listening Domain Audio File: Frequency and Percentage of EL Students Observed in Each Rating Category by Disability Category

EL Status	Disability Category	Grade or Grade Span	Not at All	Entirely
Non-EL	BLV	Grade span 3–5	0 (0)	2 (100)
Non-EL	BLV	Grade span 6–8	1 (50)	1 (50)
Non-EL	BLV	Grade span 9–12	0 (0)	1 (100)
Non-EL	DHH	Grade span 3–5	7 (87)	1 (13)
Non-EL	DHH	Grade span 6–8	3 (100)	0 (0)
Non-EL	DHH	Grade span 9–12	3 (83)	1 (17)

Table C.10. Speaking Hesitant to Record: Frequency and Percentage of EL Students Observed in Each Rating Category by Disability Category

EL Status	Disability Category	Grade or Grade Span	Not at All	Entirely
Non-EL	BLV	TK/K	N/A	N/A
Non-EL	BLV	Grade 1	1 (100)	0 (0)
Non-EL	BLV	Grade 2	N/A	N/A
Non-EL	BLV	Grade span 3–5	2 (100)	0 (0)
Non-EL	BLV	Grade span 6–8	1 (100)	0 (0)
Non-EL	BLV	Grade span 9–12	1 (60)	< 1 (40)
Non-EL	DHH	TK/K	2 (88)	< 1 (13)
Non-EL	DHH	Grade 1	N/A	N/A
Non-EL	DHH	Grade 2	N/A	N/A
Non-EL	DHH	Grade span 3–5	7 (91)	< 1 (9)
Non-EL	DHH	Grade span 6–8	3 (100)	0 (0)
Non-EL	DHH	Grade span 9–12	3 (100)	0 (0)

Table C.11. Writing Domain Student Familiarity with Typing: Frequency and Percentage of EL Students Observed in Each Rating Category by Disability Category

EL Status	Disability Category	Grade or Grade Span	Not at All	Partially	Entirely
Non-EL	BLV	Grade span 3–5	2 (100)	0 (0)	0 (0)
Non-EL	BLV	Grade span 6–8	N/A	N/A	N/A
Non-EL	BLV	Grade span 9–12	0 (0)	0 (0)	1 (100)
Non-EL	DHH	Grade span 3–5	1 (12)	8 (68)	2 (20)
Non-EL	DHH	Grade span 6–8	0 (0)	0 (0)	5 (100)
Non-EL	DHH	Grade span 9–12	1 (11)	0 (0)	4 (89)

Table C.12. Students Needed Technological Assistance: Frequency and Percentage of Non-EL Students Observed in Each Rating Category by Disability Category

EL Status	Disability Category	Domain	Grade or Grade Span	No	Yes
Non-EL	BLV	Listening	Grade span 3–5	0 (0)	2 (100)
Non-EL	BLV	Listening	Grade span 6–8	0 (0)	1 (100)
Non-EL	BLV	Listening	Grade span 9–12	0 (0)	1 (100)
Non-EL	BLV	Reading	Grade span 3–5	0 (0)	2 (100)
Non-EL	BLV	Reading	Grade span 6–8	1 (50)	1 (50)
Non-EL	BLV	Reading	Grade span 9–12	1 (50)	1 (50)
Non-EL	BLV	Writing	Grade span 3–5	2 (100)	0 (0)
Non-EL	BLV	Writing	Grade span 6–8	N/A	N/A
Non-EL	BLV	Writing	Grade span 9–12	0 (0)	1 (100)
Non-EL	BLV	Speaking	Grade span 3–5	2 (78)	< 1 (22)
Non-EL	BLV	Speaking	Grade span 6–8	1 (60)	< 1 (40)
Non-EL	BLV	Speaking	Grade span 9–12	1 (100)	0 (0)
Non-EL	DHH	Listening	Grade span 3–5	7 (87)	1 (13)
Non-EL	DHH	Listening	Grade span 6–8	2 (60)	1 (40)
Non-EL	DHH	Listening	Grade span 9–12	3 (100)	0 (0)
Non-EL	DHH	Reading	Grade span 3–5	8 (100)	0 (0)
Non-EL	DHH	Reading	Grade span 6–8	1 (100)	0 (0)
Non-EL	DHH	Reading	Grade span 9–12	4 (100)	0 (0)
Non-EL	DHH	Writing	Grade span 3–5	9 (72)	3 (28)
Non-EL	DHH	Writing	Grade span 6–8	5 (92)	< 1 (8)
Non-EL	DHH	Writing	Grade span 9–12	5 (100)	0 (0)
Non-EL	DHH	Speaking	Grade span 3–5	8 (97)	< 1 (3)
Non-EL	DHH	Speaking	Grade span 6–8	3 (92)	< 1 (8)
Non-EL	DHH	Speaking	Grade span 9–12	3 (100)	0 (0)

Table C.13. Students Requested Technological Assistance: Frequency and Percentage of Non-EL Students Observed in Each Rating Category by Disability Category

EL Status	Disability Category	Domain	Grade or Grade Span	No	Yes
Non-EL	BLV	Listening	Grade span 3–5	1 (33)	1 (67)
Non-EL	BLV	Listening	Grade span 6–8	0 (0)	1 (100)
Non-EL	BLV	Listening	Grade span 9–12	1 (100)	0 (0)
Non-EL	BLV	Reading	Grade span 3–5	0 (0)	2 (100)
Non-EL	BLV	Reading	Grade span 6–8	1 (100)	0 (0)
Non-EL	BLV	Reading	Grade span 9–12	1 (100)	0 (0)
Non-EL	BLV	Writing	Grade span 3–5	2 (100)	0 (0)
Non-EL	BLV	Writing	Grade span 6–8	N/A	N/A
Non-EL	BLV	Writing	Grade span 9–12	1 (67)	< 1 (33)
Non-EL	BLV	Speaking	Grade span 3–5	2 (100)	0 (0)
Non-EL	BLV	Speaking	Grade span 6–8	1 (100)	0 (0)
Non-EL	BLV	Speaking	Grade span 9–12	1 (100)	0 (0)
Non-EL	DHH	Listening	Grade span 3–5	8 (100)	0 (0)
Non-EL	DHH	Listening	Grade span 6–8	2 (80)	0 (0)
Non-EL	DHH	Listening	Grade span 9–12	3 (83)	1 (17)
Non-EL	DHH	Reading	Grade span 3–5	8 (100)	0 (0)
Non-EL	DHH	Reading	Grade span 6–8	1 (100)	0 (0)
Non-EL	DHH	Reading	Grade span 9–12	4 (100)	0 (0)
Non-EL	DHH	Writing	Grade span 3–5	11 (92)	1 (8)
Non-EL	DHH	Writing	Grade span 6–8	5 (92)	< 1 (8)
Non-EL	DHH	Writing	Grade span 9–12	5 (100)	0 (0)
Non-EL	DHH	Speaking	Grade span 3–5	8 (100)	0 (0)
Non-EL	DHH	Speaking	Grade span 6–8	3 (100)	0 (0)
Non-EL	DHH	Speaking	Grade span 9–12	3 (100)	0 (0)

Table C.14. Students Received Technological Assistance: Frequency and Percentage of Non-EL Students Observed in Each Rating Category by Disability Category

EL Status	Disability Category	Domain	Grade or Grade Span	No	Yes
Non-EL	BLV	Listening	Grade span 3–5	1 (67)	1 (33)
Non-EL	BLV	Listening	Grade span 6–8	0 (0)	1 (100)
Non-EL	BLV	Listening	Grade span 9–12	0 (0)	1 (100)
Non-EL	BLV	Reading	Grade span 3–5	0 (0)	2 (100)
Non-EL	BLV	Reading	Grade span 6–8	0 (0)	1 (100)
Non-EL	BLV	Reading	Grade span 9–12	0 (0)	1 (100)
Non-EL	BLV	Writing	Grade span 3–5	2 (100)	0 (0)
Non-EL	BLV	Writing	Grade span 6–8	N/A	N/A
Non-EL	BLV	Writing	Grade span 9–12	0 (0)	1 (100)
Non-EL	BLV	Speaking	Grade span 3–5	2 (89)	0 (11)
Non-EL	BLV	Speaking	Grade span 6–8	1 (100)	0 (0)
Non-EL	BLV	Speaking	Grade span 9–12	< 1 (20)	1 (80)
Non-EL	DHH	Listening	Grade span 3–5	4 (47)	5 (53)
Non-EL	DHH	Listening	Grade span 6–8	1 (40)	2 (60)
Non-EL	DHH	Listening	Grade span 9–12	3 (100)	0 (0)
Non-EL	DHH	Reading	Grade span 3–5	5 (64)	3 (35)
Non-EL	DHH	Reading	Grade span 6–8	1 (100)	0 (0)
Non-EL	DHH	Reading	Grade span 9–12	4 (100)	0 (0)
Non-EL	DHH	Writing	Grade span 3–5	4 (32)	8 (68)
Non-EL	DHH	Writing	Grade span 6–8	3 (67)	2 (34)
Non-EL	DHH	Writing	Grade span 9–12	5 (100)	0 (0)
Non-EL	DHH	Speaking	Grade span 3–5	8 (97)	< 1 (3)
Non-EL	DHH	Speaking	Grade span 6–8	3 (92)	< 1 (8)
Non-EL	DHH	Speaking	Grade span 9–12	3 (100)	0 (0)

Table C.15. Students Received Reminders About Accessibility Resources: Frequency and Percentage of Non-EL Students Observed in Each Rating Category by Disability Category

EL Status	Disability Category	Domain	Grade or Grade Span	No	Yes
Non-EL	BLV	Listening	Grade span 3–5	1 (33)	1 (67)
Non-EL	BLV	Listening	Grade span 6–8	1 (50)	1 (50)
Non-EL	BLV	Listening	Grade span 9–12	0 (0)	1 (100)
Non-EL	BLV	Reading	Grade span 3–5	0 (0)	2 (100)
Non-EL	BLV	Reading	Grade span 6–8	1 (100)	0 (0)
Non-EL	BLV	Reading	Grade span 9–12	1(100)	0 (0)
Non-EL	BLV	Writing	Grade span 3–5	2 (100)	0 (0)
Non-EL	BLV	Writing	Grade span 6–8	N/A	N/A
Non-EL	BLV	Writing	Grade span 9–12	0 (0)	1 (100)
Non-EL	DHH	Listening	Grade span 3–5	7 (87)	1 (13)
Non-EL	DHH	Listening	Grade span 6–8	2 (80)	1 (20)
Non-EL	DHH	Listening	Grade span 9–12	3 (100)	0 (0)
Non-EL	DHH	Reading	Grade span 3–5	6 (79)	2 (21)
Non-EL	DHH	Reading	Grade span 6–8	1 (100)	0 (0)
Non-EL	DHH	Reading	Grade span 9–12	4 (100)	0 (0)
Non-EL	DHH	Writing	Grade span 3–5	7 (60)	5 (40)
Non-EL	DHH	Writing	Grade span 6–8	4 (75)	1 (25)
Non-EL	DHH	Writing	Grade span 9–12	5 (100)	0 (0)

Table C.16. Students Whose Test Examiners Assisted with the Accessibility Resources: Frequency and Percentage of Non-EL Students Observed in Each Rating by Disability Category

EL Status	Disability Category	Domain	Grade or Grade Span	No	Yes
Non-EL	BLV	Listening	Grade span 3–5	0 (0)	2 (100)
Non-EL	BLV	Listening	Grade span 6–8	0 (0)	1 (100)
Non-EL	BLV	Listening	Grade span 9–12	0 (0)	2 (100)
Non-EL	BLV	Reading	Grade span 3–5	0 (0)	2 (100)
Non-EL	BLV	Reading	Grade span 6–8	0 (0)	1 (100)
Non-EL	BLV	Reading	Grade span 9–12	0 (0)	2 (100)
Non-EL	BLV	Writing	Grade span 3–5	2 (100)	0 (0)
Non-EL	BLV	Writing	Grade span 6–8	N/A	N/A
Non-EL	BLV	Writing	Grade span 9–12	0 (0)	1 (100)
Non-EL	DHH	Listening	Grade span 3–5	8 (100)	0 (0)
Non-EL	DHH	Listening	Grade span 6–8	2 (80)	1 (20)
Non-EL	DHH	Listening	Grade span 9–12	3 (83)	1 (17)
Non-EL	DHH	Reading	Grade span 3–5	7 (86)	1 (14)
Non-EL	DHH	Reading	Grade span 6–8	1 (100)	0 (0)
Non-EL	DHH	Reading	Grade span 9–12	4 (100)	0 (0)
Non-EL	DHH	Writing	Grade span 3–5	8 (64)	4 (36)
Non-EL	DHH	Writing	Grade span 6–8	3 (58)	2 (42)
Non-EL	DHH	Writing	Grade span 9–12	5 (100)	0 (0)

Table C.17. Clarity of the *DFA* for Test Examiners: Frequency and Percentage of Test Administrations Observed in Each Rating Category for Non-EL Students by Disability Category

EL Status	Disability Category	Domain	Grade or Grade Span	Not at All	Partially	Entirely
Non-EL	BLV	Listening	K	N/A	N/A	N/A
Non-EL	BLV	Listening	Grade 1	0 (0)	0 (0)	1 (100)
Non-EL	BLV	Listening	Grade 2	N/A	N/A	N/A
Non-EL	BLV	Listening	Grade span 3–5	0 (0)	0 (0)	2 (100)
Non-EL	BLV	Listening	Grade span 6–8	0 (0)	0 (0)	1 (100)
Non-EL	BLV	Listening	Grade span 9–12	0 (0)	0 (0)	1 (100)
Non-EL	BLV	Reading	K	N/A	N/A	N/A
Non-EL	BLV	Reading	Grade 1	N/A	N/A	N/A
Non-EL	BLV	Reading	Grade 2	N/A	N/A	N/A
Non-EL	BLV	Reading	Grade span 3–5	0 (0)	2 (100)	0 (0)
Non-EL	BLV	Reading	Grade span 6–8	0 (0)	1 (100)	0 (0)
Non-EL	BLV	Reading	Grade span 9–12	0 (0)	0 (0)	1 (100)
Non-EL	BLV	Writing	Grade span 3–5	0 (0)	2 (100)	0 (0)
Non-EL	BLV	Writing	Grade span 6–8	N/A	N/A	N/A
Non-EL	BLV	Writing	Grade span 9–12	0 (0)	< 1 (33)	1 (67)
Non-EL	BLV	Speaking	TK/K	N/A	N/A	N/A
Non-EL	BLV	Speaking	Grade 1	0 (0)	0 (0)	1 (100)
Non-EL	BLV	Speaking	Grade 2	N/A	N/A	N/A
Non-EL	BLV	Speaking	Grade span 3–5	0 (0)	< 1 (22)	2 (78)
Non-EL	BLV	Speaking	Grade span 6–8	0 (0)	< 1 (40)	1 (60)
Non-EL	BLV	Speaking	Grade span 9–12	0 (0)	< 1 (40)	1 (60)
Non-EL	DHH	Listening	K	0 (0)	0 (0)	2 (100)
Non-EL	DHH	Listening	Grade 1	N/A	N/A	N/A
Non-EL	DHH	Listening	Grade 2	N/A	N/A	N/A
Non-EL	DHH	Listening	Grade span 3–5	0 (0)	0 (0)	8 (100)
Non-EL	DHH	Listening	Grade span 6–8	0 (0)	0 (0)	3 (100)
Non-EL	DHH	Listening	Grade span 9–12	0 (0)	0 (0)	3 (100)
Non-EL	DHH	Reading	K	1 (25)	0 (0)	3 (75)
Non-EL	DHH	Reading	Grade 1	2 (33)	< 1 (7)	4 (60)
Non-EL	DHH	Reading	Grade 2	0 (0)	0 (0)	3 (100)
Non-EL	DHH	Reading	Grade span 3–5	0 (0)	0 (0)	8 (100)
Non-EL	DHH	Reading	Grade span 6–8	0 (0)	0 (0)	1 (100)
Non-EL	DHH	Reading	Grade span 9–12	1 (25)	1 (13)	3 (63)

Table C.17 *(continuation)*

EL Status	Disability Category	Domain	Grade or Grade Span	Not at All	Partially	Entirely
Non-EL	DHH	Writing	Grade span 3–5	5 (40)	0 (0)	7 (60)
Non-EL	DHH	Writing	Grade span 6–8	2 (42)	0 (0)	3 (58)
Non-EL	DHH	Writing	Grade span 9–12	2 (33)	0 (0)	3 (67)
Non-EL	DHH	Speaking	TK/K	0 (0)	1 (63)	1 (38)
Non-EL	DHH	Speaking	Grade 1	N/A	N/A	N/A
Non-EL	DHH	Speaking	Grade 2	N/A	N/A	N/A
Non-EL	DHH	Speaking	Grade span 3–5	1 (14)	3 (31)	4 (54)
Non-EL	DHH	Speaking	Grade span 6–8	1 (17)	1 (42)	1 (42)
Non-EL	DHH	Speaking	Grade span 9–12	0 (0)	3 (100)	0 (0)