



Coaching Session 1: Adapting an Existing Measure for the ELI Pilot

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October 3, 2019



Welcome and introductions

Please share:

- Name
- Job title
- How you have been involved so far in planning for an Early Learning Inventory (ELI) pilot





Session 1 objectives

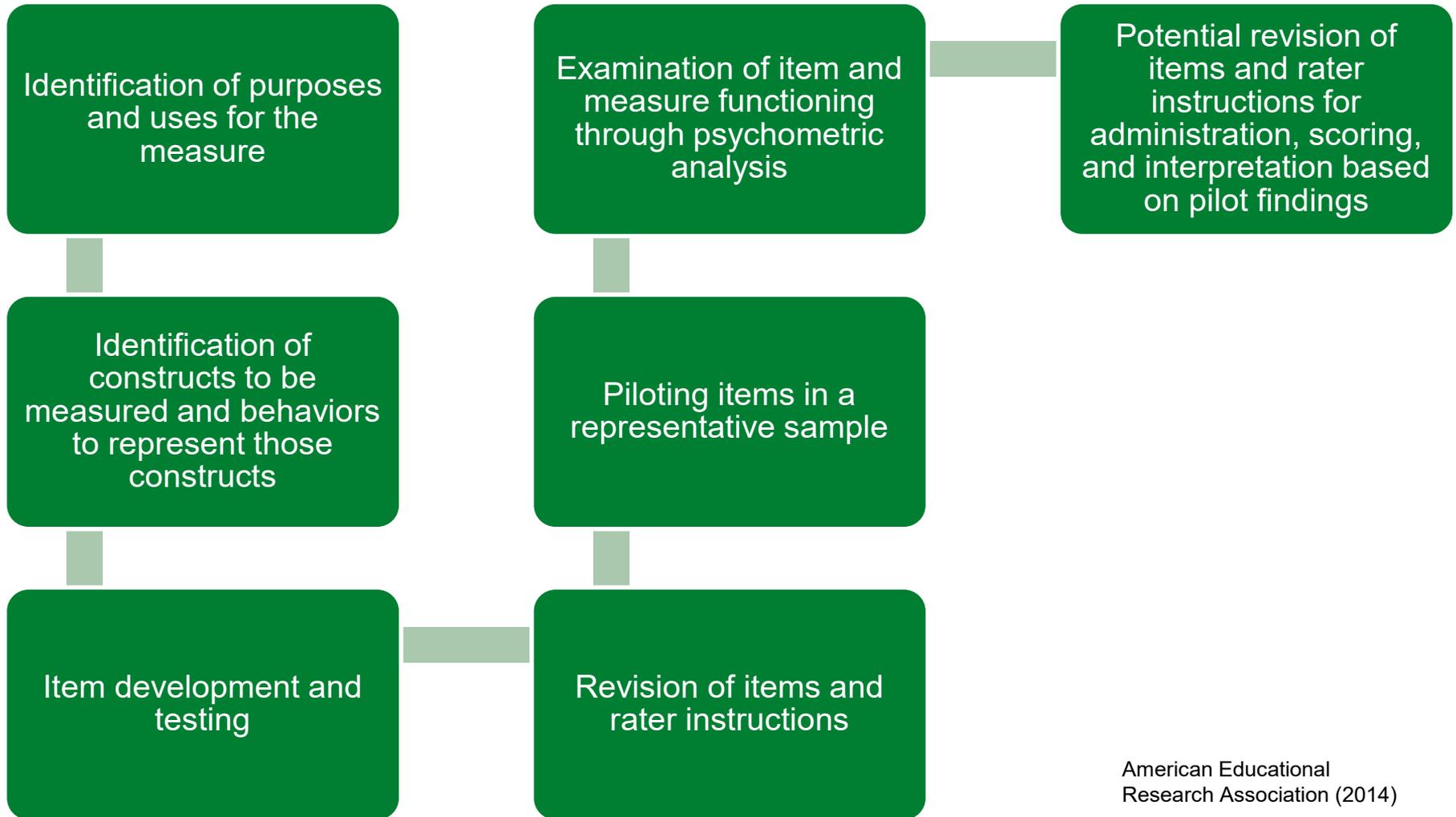
1. Outline a systematic process for adapting an existing measure.
2. Build capacity to develop new items or modify existing items to align to state academic standards.
3. Develop a draft management plan to prepare for the Early Learning Inventory (ELI) pilot study implementation.

Agenda

1. Measure development process
2. Review New Mexico Kindergarten Observation Tool (KOT)
3. Review content alignment to kindergarten standards
4. Modify an existing KOT item
5. Codevelop management plan
6. Next steps

Measure development process

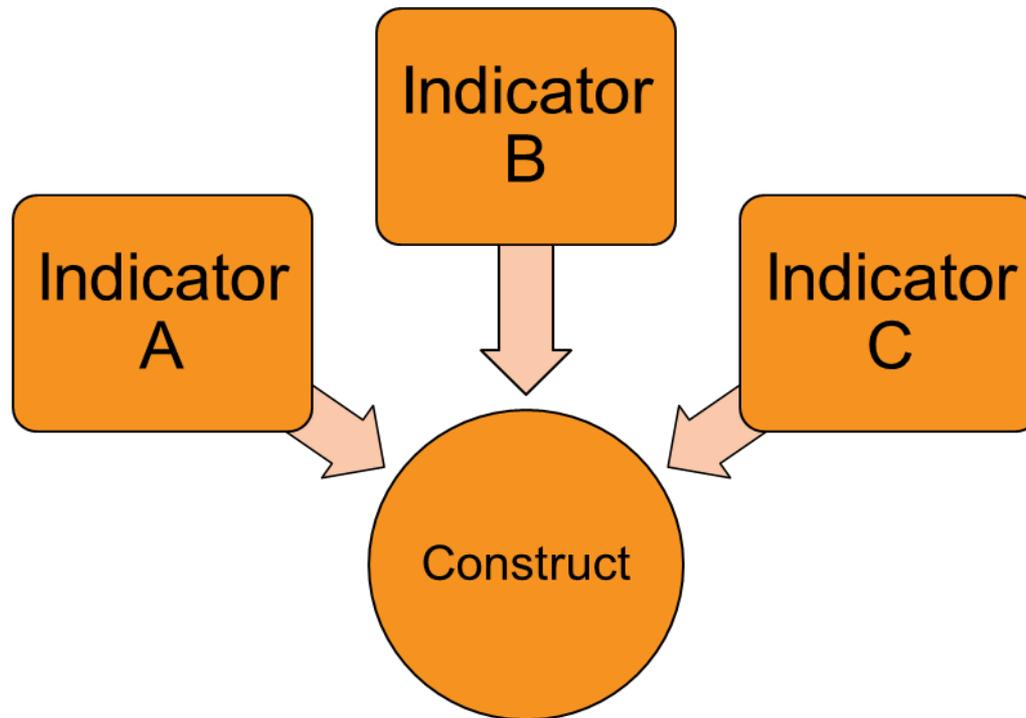
Measure development process



Step 1: Identification of purposes and uses for the measure



Step 2: Identification of constructs to be measured and behaviors to represent those constructs



What are the key constructs you seek to measure with the ELI?

Step 3: Item development and testing

Representativeness

Comprehensiveness

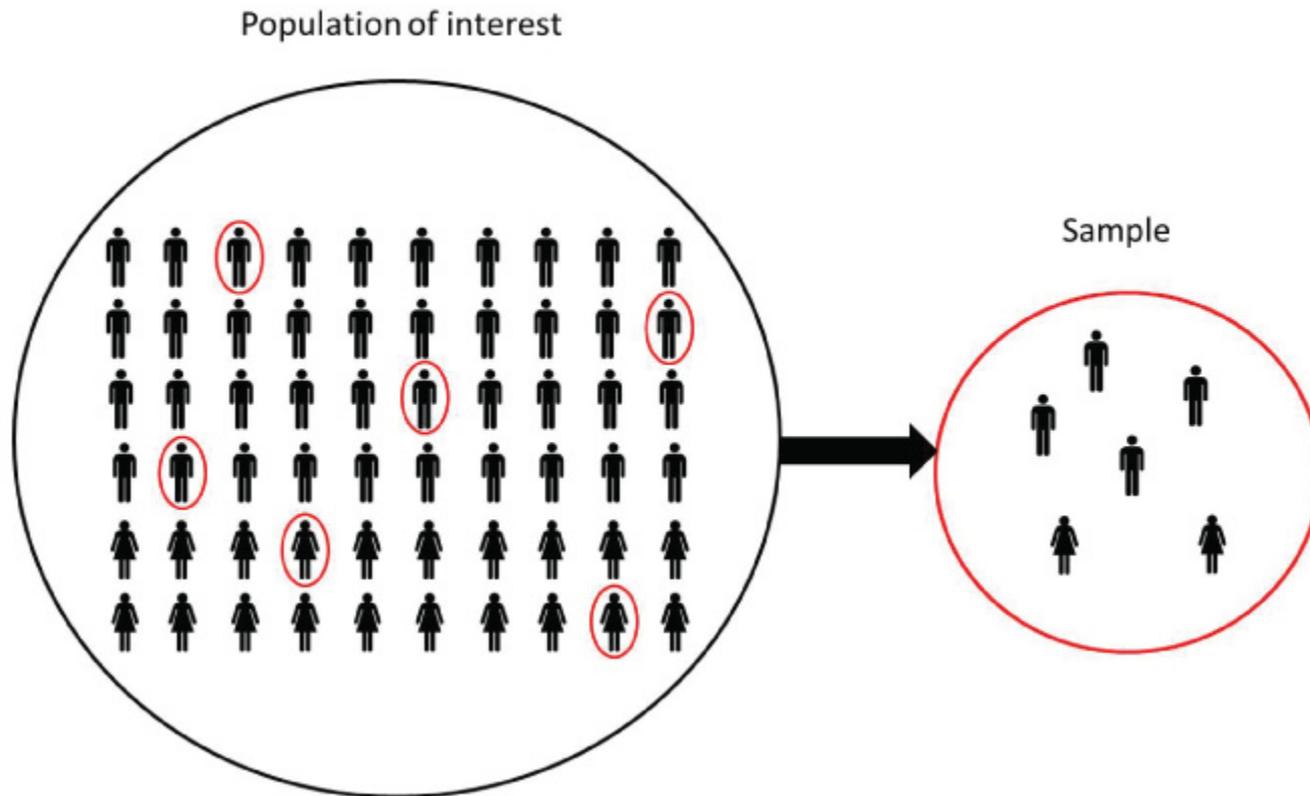
Clarity



Step 4: Revision of items and rater instructions



Step 5: Piloting items in a representative sample

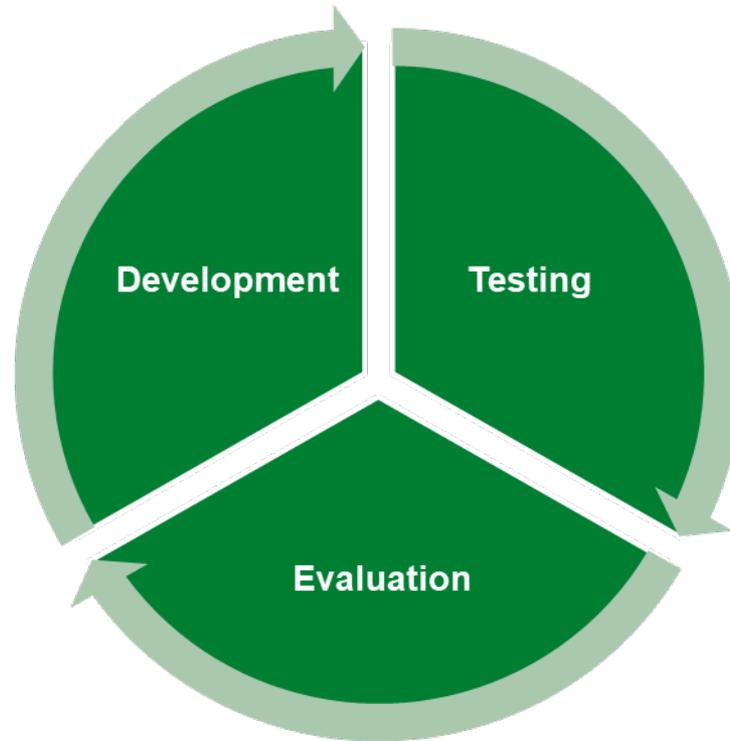


Step 6: Examination of item and measure functioning through psychometric analysis

- Factor Analysis (Exploratory and Confirmatory)
- Differential Item Functioning (DIF)
- Concurrent Validity
- Reliability
 - Test-retest
 - Inter-rater



Step 7: Potential revision of items and rater instructions for administration, scoring, and interpretation based on pilot findings



Review

New Mexico KOT

New Mexico KOT

New Mexico Preschool Observation Tool Essential Indicators



New Mexico Kindergarten Observation Tool

December 2018

Literacy/English Language Arts

- E.I. #5.2: Demonstrates the ability to attend, understand, and follow increasingly complex directions. *(Follows directions)*
- E.I. #5.3: Demonstrates increasing abilities to understand and use language by the number, variety, and complexity of words across varied purposes. *(Vocabulary)*
- E.I. #6.1: Demonstrates the ability to effectively engage in a range of conversational skills in his or her home language (including ASL) for a variety of purposes relating to real experiences and different audiences. *(Conversational ability)*
- E.I. #7.3a: Shows an understanding of the basic concepts of print. *(Concepts of print)*
- E.I. #7.3b: Understands that print carries meaning. *(Print meaning)*
- E.I. #7.4a: Recognizes and generates rhyming sounds in spoken language. *(Rhyme)*
- E.I. #7.4b: Demonstrates an understanding of spoken words, syllables, and sounds (phonemes). *(Phonological Awareness)*
- E.I. #7.5a: Shows an understanding of alphabetic knowledge. *(Letter Naming)*
- E.I. #7.5b: Knows and applies letter-sound correspondence and beginning sound-recognition skills. *(Letter-Sound Correspondence)*
- E.I. #8.3: Understands how to apply the early stages of drawing and writing to convey meaning. *(Writing)*

In 2017, REL Southwest conducted a validation study of the New Mexico KOT



December 2017

Applied Research Methods

Scientific evidence for the validity of the New Mexico Kindergarten Observation Tool

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Laura Hawkinson
American Institutes for Research

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Key findings

This study examined the construct validity of the 2015 New Mexico Kindergarten Observation Tool (KOT), an observational measure of students' knowledge and skills completed by the kindergarten teacher at the beginning of the year. Key findings include:

- Construct validity analyses supported an overall general school readiness score and two domain scores: a cognitive school readiness domain score and a noncognitive school readiness domain score. The analyses did not support the six domain scores identified by the developer.
- KOT domain scores were moderately correlated with scores from an established measure of early literacy skills, and the correlation patterns support the conclusion that the KOT domains measure distinct dimensions of school readiness.
- Rating categories were distinct (that is, no category was redundant) and ordered appropriately (that is, teachers used higher rating categories for students with higher overall ability).
- Substantial classroom-level variation was found for KOT domain scores and item ratings. Such variation is not uncommon among observational measures or indirect assessments, but it raises questions about the extent to which scores measure students' true abilities.

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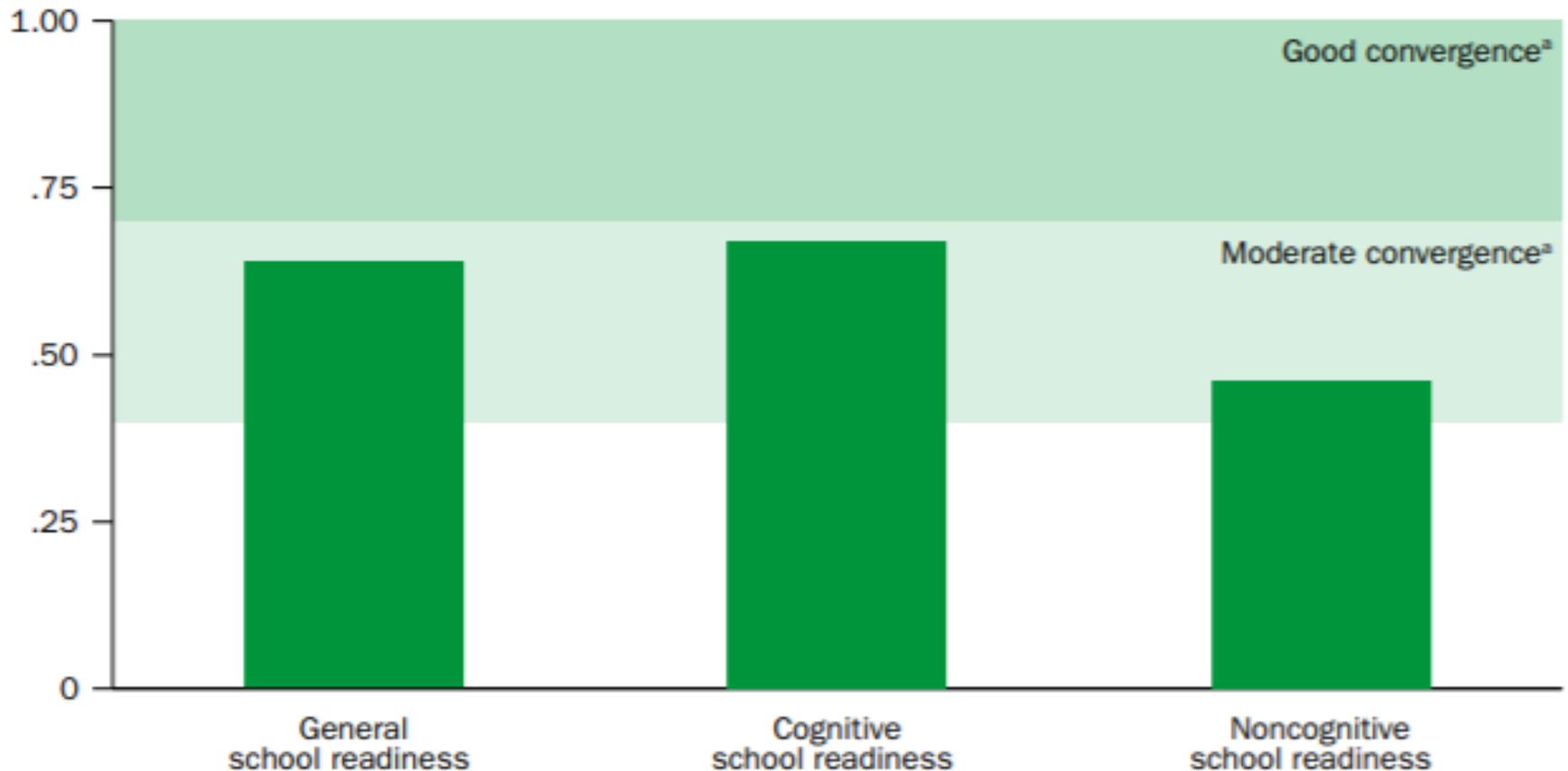
REL SOUTHWEST
Regional Educational Laboratory
At SEDL

Construct validity analysis supported an overall school readiness score and two domain scores:

1. Cognitive school readiness
2. Noncognitive school readiness

| Cognitive school readiness domain | | Noncognitive school readiness domain | |
|--|----------------|---|----------------|
| Item | Factor loading | Item | Factor loading |
| Number words (Numeracy 9.3a) | .88 | Self-control (Self, family, and community 18.1) | .86 |
| Alphabet knowledge and word/letter recognition (Literacy 7.4) | .84 | Cares for possessions (Self, family, and community 19.1) | .83 |
| Letter-sounds, beginning sound (Literacy 5.3b) | .82 | Guidance and support (Self, family, and community 21.2) | .80 |
| One-to-one correspondence, number relationships (Numeracy 9.1) | .81 | Independence (Approaches to learning 24.2) | .78 |
| Numerals (Numeracy 9.3b) | .78 | Social problem solving (Self, family, and community 20.2) | .77 |
| Vocabulary (Literacy 5.4) | .73 | Focus (Approaches to learning 27.1) | .76 |
| Story comprehension (Literacy 7.2) | .72 | Plays and interacts (Self, family, and community 20.1) | .74 |
| Measurement (Numeracy 11.3) | .71 | Follows directions (Literacy 5.2) | .52 |
| Book conventions (Literacy 7.3) | .69 | | |
| Rhyme (Literacy 5.3a) | .68 | | |
| Book enjoyment (Literacy 7.1) | .67 | | |
| Conversational ability (Literacy 6.1) | .66 | | |
| Writing (Literacy 8.3) | .66 | | |
| Sorting (Numeracy 12.1) | .64 | | |
| Investigations (Scientific conceptual understanding 14.1) | .55 | | |
| Earth science (Scientific conceptual understanding 16.1) | .55 | | |

KOT scores were **moderately correlated** with DIBELS scores



Potential differential item functioning (DIF) for four items

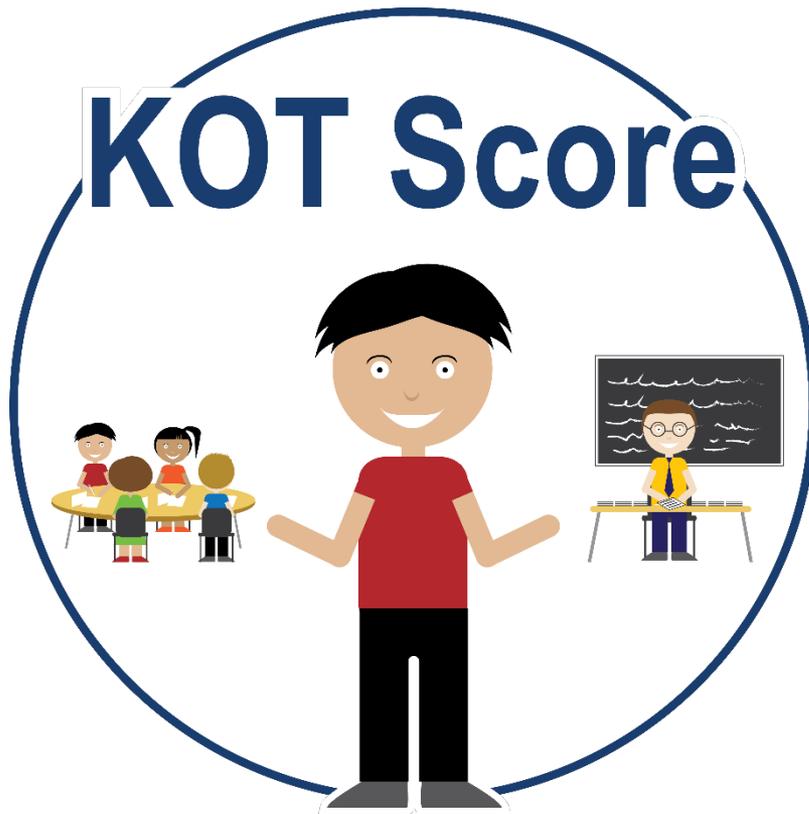
| Item | Domain | Subgroup comparison | Favored subgroup |
|-------------------------------|-------------------------------|---|---|
| Fine motor skills (2.1) | General school readiness | Hispanic students versus American Indian/Alaska Native students | American Indian/Alaska Native students |
| | | White students versus American Indian/Alaska Native students | American Indian/Alaska Native students |
| Cares for possessions (19.1) | General school readiness | White students versus American Indian/Alaska Native students | American Indian/Alaska Native students |
| Conversational ability (6.1) | Cognitive school readiness | Special education status | Students who are not in special education |
| Social problem solving (20.2) | Noncognitive school readiness | White students versus American Indian/Alaska Native students | White students |

KOT rating categories worked well

Rating categories were distinct and ordered appropriately. Higher ratings represent higher overall ability within domains.

1. Making progress for 4s
2. Accomplished for 4s
3. Making progress for K
4. Accomplished for K
5. Making progress for grade 1

Evidence of some potential rater error in using the KOT



There is evidence that variation in student scores is due, in part, to differences in how individual teachers interpret items in addition to actual differences in student skills.

**Review content
alignment to
kindergarten standards**

Content alignment: ELA

| English Language Arts | Number of objectives covered | Total number of objectives | Range of Knowledge |
|---|------------------------------|----------------------------|--------------------|
| Standard 1. Speaking and Listening Students will speak and listen effectively in a variety of situations including, but not limited to, responses to reading and writing. | 6 | 6 | 100%* |
| Standard 2. Reading Foundations^a Students will develop foundational skills for future reading success by working with sounds, letters, and text. Includes phonological awareness, print concepts, phonics and word study, and fluency. | 26 | 27 | 96%* |
| Standard 2. Reading and Writing Process^a Students will use a variety of recursive reading and writing processes. | | | |
| Standard 3. Critical Reading and Writing Students will apply critical thinking skills to reading and writing. | 5 | 5 | 100%* |
| Standard 4. Vocabulary Students will expand their working vocabularies to effectively communicate and understand texts. | 5 | 5 | 100%* |
| Standard 5. Language Students will apply knowledge of grammar and rhetorical style to reading and writing. | 3 | 6 | 50%* |
| Standard 6. Research Students will engage in inquiry to acquire, refine, and share knowledge. | 2 | 4 | 50%* |
| Standard 7. Multimodal Literacies Students will acquire, refine, and share knowledge through a variety of written, oral, visual, digital, non-verbal, and interactive texts. | 1 | 4 | 25% |
| Standard 8. Independent Reading and Writing Students will read and write for a variety of purposes including, but not limited to, academic and personal. | 2 | 2 | 100%* |

* The threshold for alignment is met; that is, at least 50 percent of the objectives within a standard are measured at least partially by the items within a measure.

Content alignment: Mathematics

| Mathematics | Number of objectives covered | Total number of objectives | Range of Knowledge |
|---|------------------------------|----------------------------|--------------------|
| Standard 1. Number and Operations Understand the relationship between quantities and whole numbers; Develop conceptual fluency with addition and subtraction (up to 10) using objects and pictures; Understand the relationship between whole numbers and fractions through fair share; Identify coins by name. | 9 | 11 | 82%* |
| Standard 2. Algebraic Reasoning and Algebra Duplicate patterns in a variety of contexts. | 1 | 2 | 50%* |
| Standard 3. Geometry and Measurement Recognize and sort basic two- dimensional shapes and use them to represent real-world objects; Compare and order objects according to location and measurable attributes; Tell time as it relates to daily life. | 8 | 11 | 73%* |
| Standard 4. Data and Probability Collect, organize, and interpret categorical data. | 2 | 3 | 67%* |

* The threshold for alignment is met; that is, at least 50 percent of the objectives within a standard are measured at least partially by the items within a measure.

Content alignment: Social-Emotional

| Social and emotional competency | Number of objectives covered | Total number of objectives | Range of Knowledge |
|---|------------------------------|----------------------------|--------------------|
| Competency 1. Knowledge of Self Exhibits self-awareness and personal responsibility; develops self-control and follows simple rules. | 3 | 7 | 43% |
| Competency 2. Knowledge of Others Builds relationships of mutual trust and respect with others; works cooperatively with children and adults. | 4 | 5 | 80%* |
| Competency 3. Approaches to Learning Displays persistence; uses problem-solving skills. | 2 | 4 | 50%* |
| | | | |

* The threshold for alignment is met; that is, at least 50 percent of the objectives within a standard are measured at least partially by the items within a measure.

Implications of the alignment analysis for the Oklahoma ELI



Activity Worksheet: **Identify Learning Objectives to Adapt Items for the Oklahoma Early Learning Inventory**

Activity Instructions:

Independently, review the learning objectives not covered by the New Mexico Kindergarten Observation Tool, by subject area, in the content alignment tables.

In pairs, rank order the importance of the learning objectives, by subject area, in terms of what can provide classroom teachers with the most actionable additional information to change instructional practices or materials to support learning.

Share rankings and reasons for rankings with the whole group.

**Modify an existing
KOT item**

Codevelop management plan

Next steps

Questions?



Thank you!



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