Early Childhood Comprehensive Assessment System

Partnership between Maryland and Ohio

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CAS Development Team

Maryland State Department of Education
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Ohio Department of Education

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School of Education

WestEd
Agenda

• Overview

• Assessment Development

• Professional Development

• Technical Features

• Discussion
EC CAS Overview
What is the EC-CAS?

- the KEA
- a series of formative assessments
- a system of PD
- a data-capture and reporting system
The 7 Developmental Domains

- Social Foundations,
- Physical Well-being and Motor Development,
- Language and Literacy,
- Mathematics,
- Science,
- Social Studies,
- Arts
EC-CAS Purpose

- Support children’s development and academic achievement to improve early learning
- Measure the progress of children in all essential domains of school readiness
EC-CAS: The Scope

- Used with children 36-72 months of age
- Formative and Summative Assessments
- ONE Comprehensive Assessment System with built-in accommodations for ALL students
EC-CAS: The Scope

- Valid and reliable to measure growth over time
- Aligned to State and National standards
- Validated by national expert panel
- Full-scale external validation study for Kindergarten Entry Assessment
Structure of the EC-CAS
## Information Provided by Two Types of Assessment Processes

Skills and Understandings

<table>
<thead>
<tr>
<th>DOMAINS</th>
<th>36 mo.</th>
<th>42 mo.</th>
<th>48 mo.</th>
<th>54 mo.</th>
<th>60 mo.</th>
<th>66 mo.</th>
<th>72 mo.</th>
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</thead>
<tbody>
<tr>
<td>Social-Foundations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English Language</td>
<td>Formative assessment</td>
<td></td>
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<tr>
<td>Math</td>
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<td></td>
<td></td>
<td>KEA</td>
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<tr>
<td>Physical-Motor</td>
<td></td>
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</tr>
<tr>
<td>Science</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Social Studies</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Arts</td>
<td>Formative assessment: Development represents a continuum of changing behaviors across ages</td>
<td></td>
<td></td>
<td>Summative assessment: &quot;a snapshot in time&quot;</td>
<td></td>
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</tbody>
</table>
Multiple Measures

- Guided recorded observation
- Portfolio (Art)
- Performance tasks
- Developmental checklists
- On-demand items
<table>
<thead>
<tr>
<th>Domain</th>
<th>Description of Item Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Social Foundations</td>
<td>A combination of:</td>
</tr>
<tr>
<td></td>
<td>- some direct student activity;</td>
</tr>
<tr>
<td></td>
<td>- primarily teacher observation/checklist; and</td>
</tr>
<tr>
<td></td>
<td>- technology-supported activities utilizing drag-and-drop of icons to answer questions that are presented with computer voice-over.</td>
</tr>
<tr>
<td>2. Physical/Motor Development</td>
<td>A combination of:</td>
</tr>
<tr>
<td></td>
<td>- some direct student activity; and</td>
</tr>
<tr>
<td></td>
<td>- primarily teacher observation/checklist.</td>
</tr>
</tbody>
</table>
## Item Types

<table>
<thead>
<tr>
<th>Domain</th>
<th>Description of Item Types</th>
</tr>
</thead>
</table>
| 3. English Language Arts       | A combination of:  
  • direct assessment/activity of the child; and  
  • technology-supported activities utilizing drag-and-drop of icons to answer questions that are presented with computer voice-over. |
| 4. Mathematical Thinking       | A combination of:  
  • direct assessment/activity of the child; and  
  • utilizing drag-and-drop of icons to answer questions that are presented with computer voice-over. |
<table>
<thead>
<tr>
<th>Item Types</th>
<th>Description</th>
</tr>
</thead>
</table>
| **5. Scientific Thinking** | A combination of:  
  - direct assessment/activity of the child; and  
  - utilizing drag-and-drop of icons to answer questions that are presented with computer voice-over. |
| **6. Social Studies**   | A combination of:  
  - direct assessment/activity of the child; and  
  - utilizing drag-and-drop of icons to answer questions that are presented with computer voice-over. |
<table>
<thead>
<tr>
<th>7. The Arts</th>
<th>A combination of:</th>
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<tbody>
<tr>
<td></td>
<td>• direct assessment/activity of the child;</td>
</tr>
<tr>
<td></td>
<td>• portfolio-based assessment items; and</td>
</tr>
<tr>
<td></td>
<td>• utilizing drag-and-drop of icons to answer questions that are presented with computer voice-over.</td>
</tr>
</tbody>
</table>
Alignments

- Birth to K Entry Standards in MD and OH
- Head Start Early Learning Framework
- Common Core State Standards
- Early Child Outcomes required for IDEA reporting
- WIDA Standards*
Administration Overview
Length of time

- **Formative**
  - Required Fall & Spring administration model
  - Optional continuous use model throughout year

- **KEA**
  - Approximately 10-15 minutes per domain
  - 6-8 week administration window in the fall
Assessment Approaches

- Direct performance assessment
  - Assessor looks for very specific behaviors or responses from the child within the context of the performance task

- Guided observational assessment in context
  - Assessor describes child’s knowledge and learning in the context of a developmental continuum or progress
Administration Types

- Primarily individual
- Some group observations
Training & Professional Development

Ongoing Coaching → Ongoing Consultation

Assessment Tools: Screening, Developmental Learning Progression, Kindergarten/School Readiness

Pre-Administration
- Purpose of Assessment Tools
- Parent Communication
- Data Security and integrity

Administration
- Administration processes/procedures
- Administrative tools/materials
- Review of Student Work Samples
- Performance Assessments
- Use of data collection and reporting system
- Considerations for Special Needs Populations
- Training on Child Response to Testing/Assessment

Use of Data
- Understanding scores
- Communicating with Parents
- Making Instructional Decisions
- Determining Data Quality/Integrity

Online/Web-based Resources
- Validation through Virtual Simulations

Online/Web-based Procedural Facilitators

Audiences: i.e., Child Care Providers, Trainers, Teachers, School Administrators, District Administrators

Communities of Practice
PD: APPROACHES

- Train the trainer model
- Web-based training, coaching, and technical assistance
- Establishment of online learning communities
- Use of simulation technology
- Integration of an evidence-based procedural facilitator
- Development of a web-based portal
Accommodations Available
Approach to Accommodations

- Appropriate for all learners
- Universal Design for Learning approach
- Built in accommodations
- 508 compliance
- Auto-leveling based on child’s functional level
Technology Infrastructure
Technology enables possibilities...
Technology Vision

- Administration and scoring
- Data capture and connection (Statewide longitudinal data systems)
- All aspects of the professional development
Technology Supports

- Enables universal access
- Administration and scoring
- Data capture and connection
- All aspects of PD
Technical Features

- Web-based
- Cloud Hosted
- Trans-media
- Top tier hosting and security
- Nightly data feeds
Relationship of Technology Structures
Profile Dashboard System

- Individual child data for teacher/parent
- Guided administration of assessment
- Class data for teacher
- Specific recommendations per child
- Aggregate data trends school, district, state
Early Childhood Comprehensive Assessment System

- Observational Rating System
- Virtual Performance Assessment
- Hands-On Performance Assessment/Teacher Observation
- Continuum of Skills & Abilities

Data to Teachers

Data to Parents

Data to Leaders
Unique Features of the CAS

- Multiple measures of assessment
- Digital portfolio system
- Open-ended environment
- Precision based auto-leveling
- Enhanced observation reliability
Reliability and Validity Studies
Validity, Reliability & Fairness

- Measured Across 3 Stages
  - Design and Development
  - Implementation
  - Ongoing Evaluation & Research
- Quantitative and Qualitative
- Cognitive Interviews
- Pilot Testing
- Field Testing
- Post-Administration Analyses
Design and Development

- Independent alignment studies to ensure content validity with regard to underlying developmental constructs
- Broad representation from state stakeholders in content, bias, and sensitivity review
Consultation of technical advisors in development of items (content review) and in development of measurement scales (psychometricians)

Three-step assessment development process: pre-pilot (including cognitive interviews), I pilot, and field test prior to the first census administration

Training of assessment administrators
Design and Development

- Frequent involvement of:
  - state stakeholders
  - early childhood experts
  - English language learners and students with disabilities experts

- Monitor adherence to Universal Design principles and review accessibility requirements for all items and tasks

- Oversee development of test security guidelines
Implementation

- Monitor and document fidelity of implementation
- Ongoing survey of stakeholders regarding unanticipated and unintended consequences during implementation
- Systematic inclusion of stakeholders in any adjustments/modifications of the system
Implementation

- Qualitative (sensitivity review) and quantitative (DIF) to remove bias
- Rigorous validity and reliability analyses to support item/task and overall assessment validity
- Rigorous internal consistency analyses to estimate population and sub-population reliabilities and measurement error at specific and defined decision points
Implementation

- Monitor impact of composite scoring and scoring practices (including analyses of item weighting algorithms)
- Monitoring of emerging effects of test use
- Monitoring of adherence to test security guidelines
- Monitor and include stakeholders in the improvement of test accessibility
Evaluation & Research

- Evaluate degree to which system components work together as intended (i.e., use of multiple measures to assess a specific indicator)
- Evaluate the degree to which technology-supported items and traditional items perform to ensure and maintain comparability
- Conduct utilization, impact, and/or cost benefit analyses to determine support for continued use of system components
Evaluation & Research

- Monitor changes to state and federal policies as well as emerging research to support suggested changes to system components
- Frequent and regular involvement of stakeholders in the monitoring of the assessment system to assess consequences of testing and evaluate system effectiveness
Evaluation & Research

- Monitor assessment scale characteristics over time
- Monitor classification accuracy and consistency over time
Evaluation & Research

- Monitor and evaluate emerging research that may impact rubrics or scoring/rating protocols. Conduct validity and reliability analyses at the sub-group level.
- Monitor impact of performance standards on all student populations over time.
- Evaluate overall system security and integrity.
Consequences of Formative Assessment Approach

◦ Rigorous qualitative and quantitative research supports both item development and domain scale calibration

◦ Combining multiple items into each developmental domain supports valid and reliable measurement capable of documenting fine-grained increments of development
Consequences of Formative Assessment Approach

◦ IRT modeling and dimensionality analyses support maximum psychometric efficiency, minimizing the number of items needed in each developmental domain, and supports use of double-coded items

◦ Validity in relation to external child development assessments can be tested
Double-Coded Items

- Reduces duplication of assessment across constructs
  - Social-Emotional Development / History-Social Studies
  - Cognitive Development / Science / Mathematical Development
  - History-Social Studies / Science
- Limits the overall number of items
- Allows for measurement of additional constructs
  - Self Regulation
  - Approaches to Learning
  - Overall Cognitive Development
Development Timeline
EC-CAS TIMELINE

2011/2012 DEVELOPMENT

2012/2013 DEVELOPMENT AND PILOT TESTING

2013/2014 FIELD TESTING (State Baseline OH)

2014/2015 FULL IMPLEMENTATION
3-Step Development Process

Pre-Pilot (2012)

- External/expert review by content area
- Focus groups with teachers
- Cognitive Labs with students
- Feedback and assessment revision
- Bias review
- Accommodations validated
3-Step Development Process

Formal Pilot (2012/2013)

- Testing pilot items in classrooms
- Feedback and assessment revision
3-Step Development Process

Field Test (Fall 2013)
- Testing of items with larger sample
- Item statistics, internal validity analysis
- Item calibration and external validity analysis
Ohio Specific Policies

- Common unique identifier
- Formative assessments
  - Step Up to Quality
  - Administration window
- KEA administration window
- Link to Third Grade Reading Guarantee
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