Developing and Refining a Model for Measuring Implementation Fidelity for an Instructionally Embedded Assessment System

Jennifer L. Kobrin

Accessible Teaching, Learning, & Assessment Systems

THE UNIVERSITY OF KANSAS
Achievement & Assessment Institute

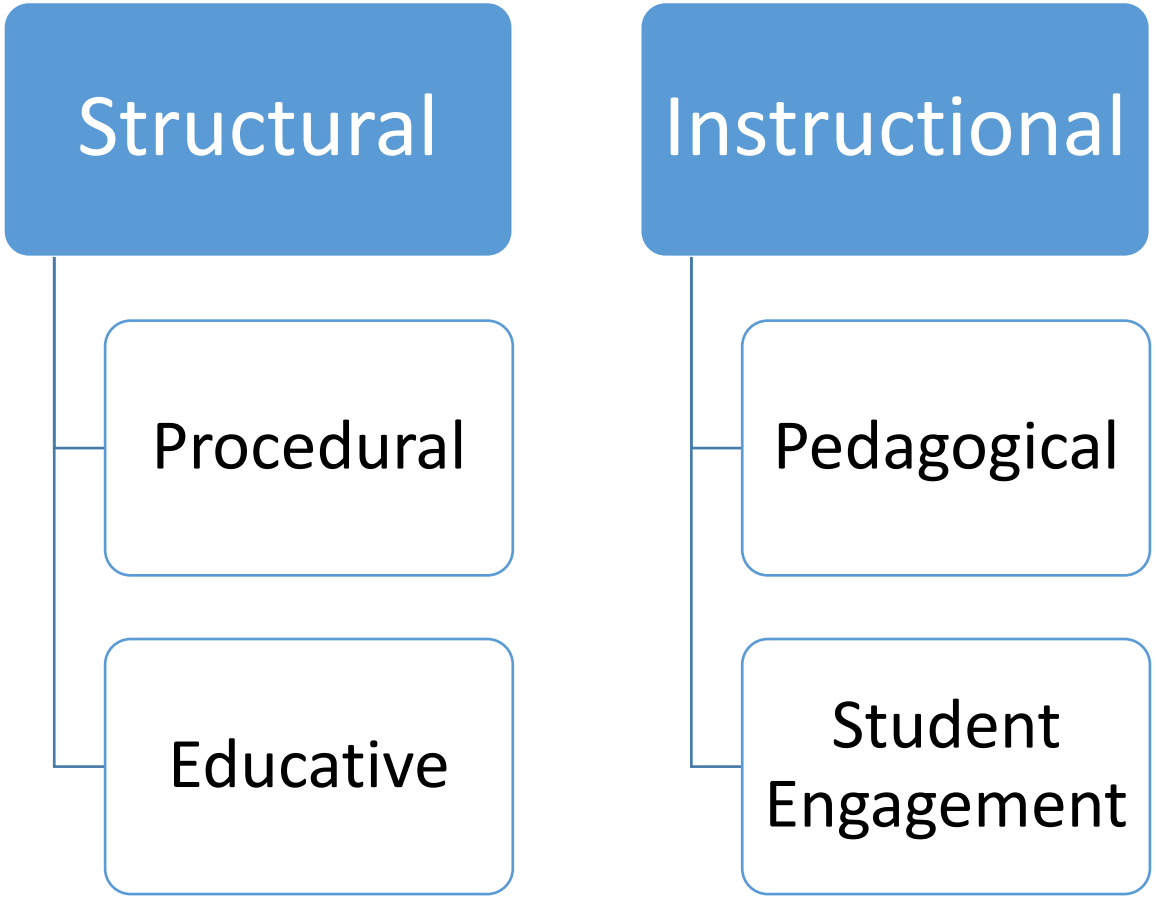
INSTRUCTIONALLY EMBEDDED ASSESSMENT

- Instructionally embedded assessments are designed to lead directly to action by teachers and students.
- Theory of Action (ToA).
  - Represents an assessment's intended effects, components and action mechanisms (e.g., Bennett, 2010; FAST SCASS, 2018).
  - Action mechanisms connect an assessment system's components to the assessment's intended effects.
- It is important to measure the extent to which action mechanisms take place

IMPLEMENTATION FIDELITY

- Implementation fidelity, common in evaluation research, can guide the evaluation of action mechanisms in an assessment's ToA.
  - *"The extent to which an enacted program is consistent with the intended program model"* (Century et al., 2010, p. 202).
- Comparison between the critical components of intended program model and the components that are actually enacted.

CENTURY ET AL. (2010) FRAMEWORK



Structural – Procedural
What a teacher needs to do
Structural – Educative
What a teacher needs to know
Instructional – Pedagogical
Expected teacher actions
Instructional – Student Engagement
Expected student actions

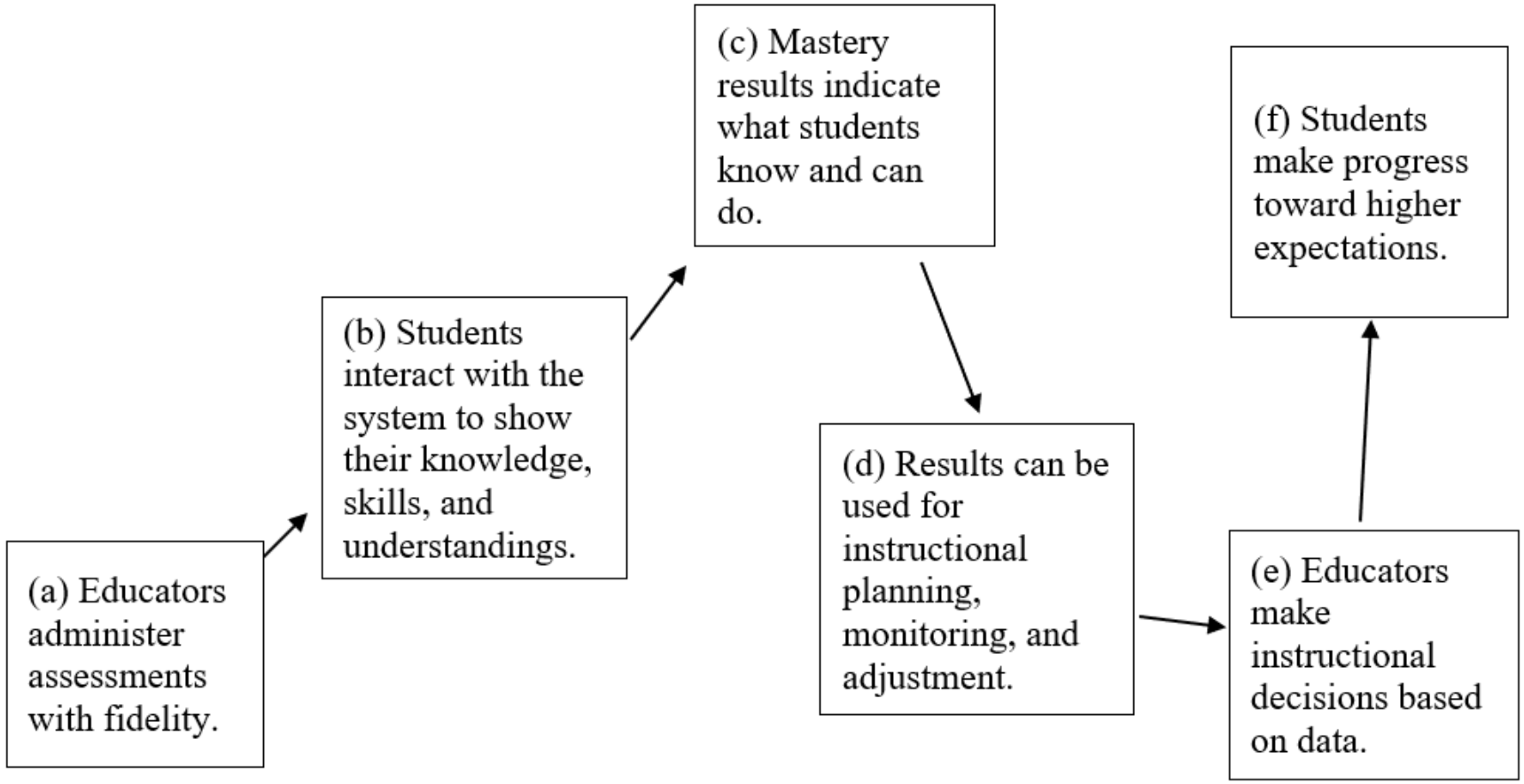
PURPOSE

- Illustrate a six-step iterative process for developing and evaluating a model of implementation fidelity for an instructionally embedded assessment system.
- Conduct exploratory analyses to collect initial evidence for the validity of the implementation fidelity model.

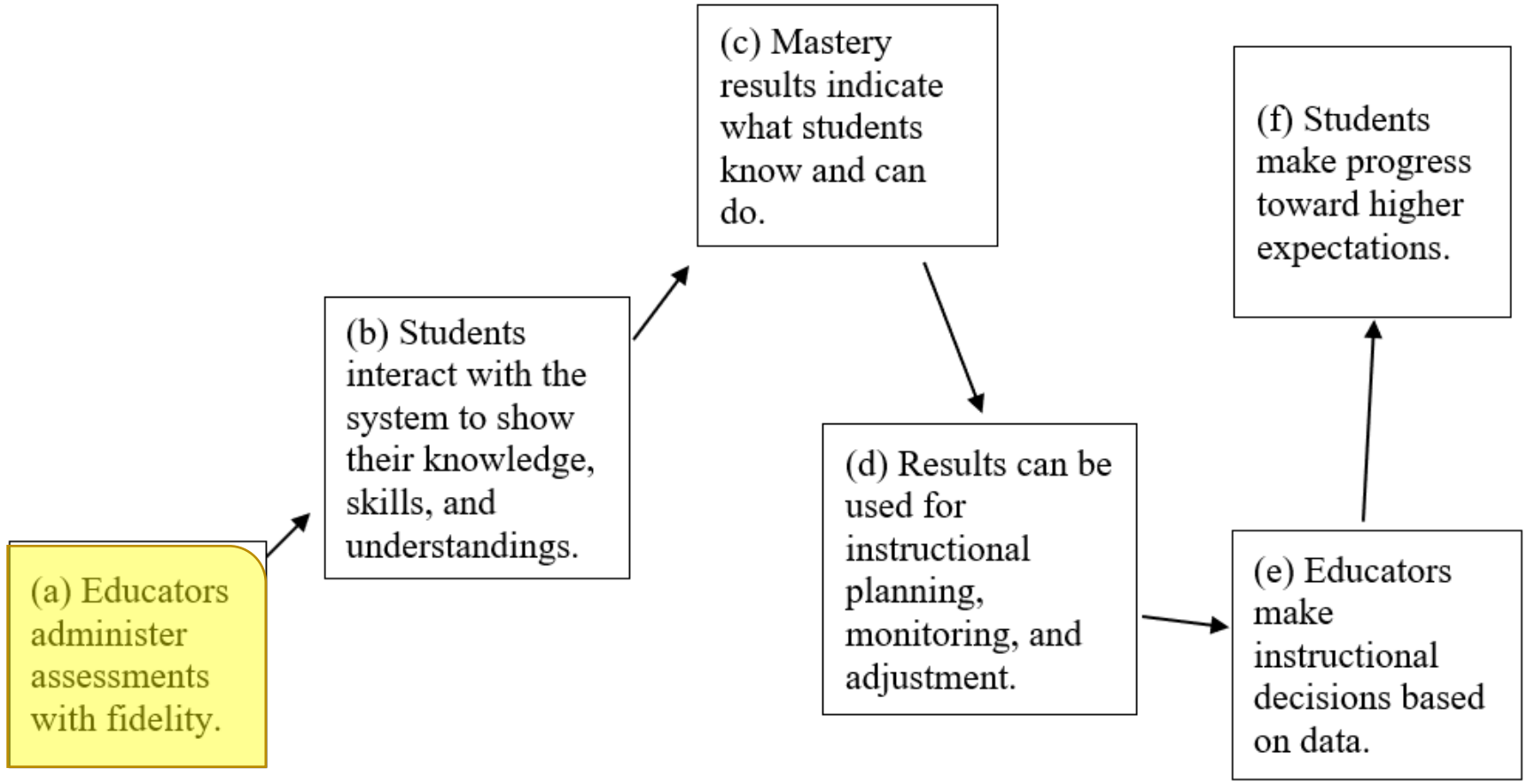
Dynamic Learning Maps Alternate Assessment (DLM)

- Measures alternate achievement standards in English language arts (ELA) and mathematics for students with the most significant cognitive disabilities.
- Instructionally embedded model has two 15-week administration windows (fall and spring).
- Teachers choose standards and level of assessments within blueprint requirements.

EXCERPT FROM DLM THEORY OF ACTION



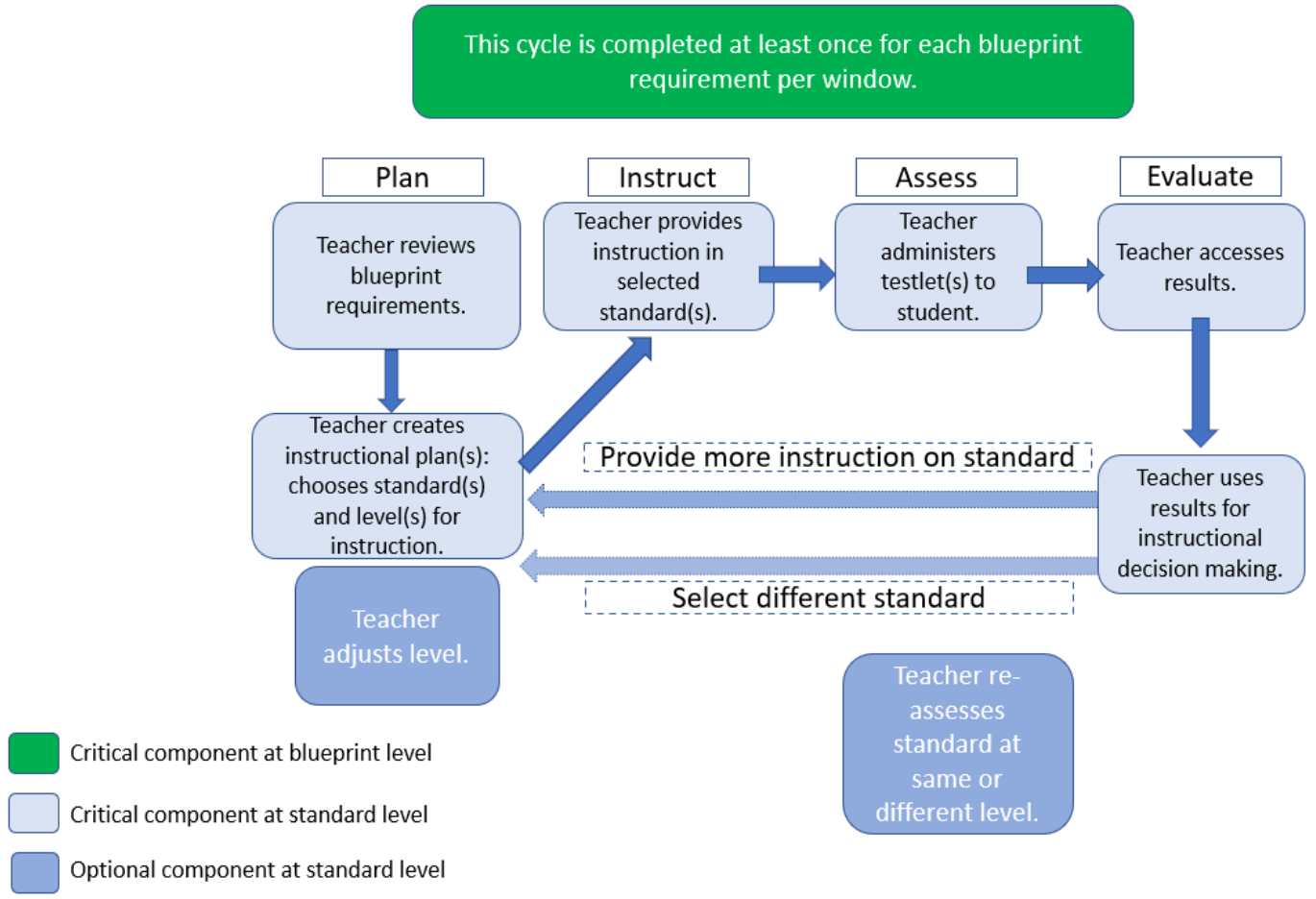
EXCERPT FROM DLM THEORY OF ACTION



6-Step Iterative Process:

1. Develop logic model identifying critical components
2. Identify process data and indicators
3. Develop hypotheses about expected patterns and define criteria for implementation fidelity
4. Conduct analyses to test the hypotheses
5. Use results to refine indicators and criteria
6. Evaluate strength of evidence and identify gaps

STEP 1: LOGIC MODEL

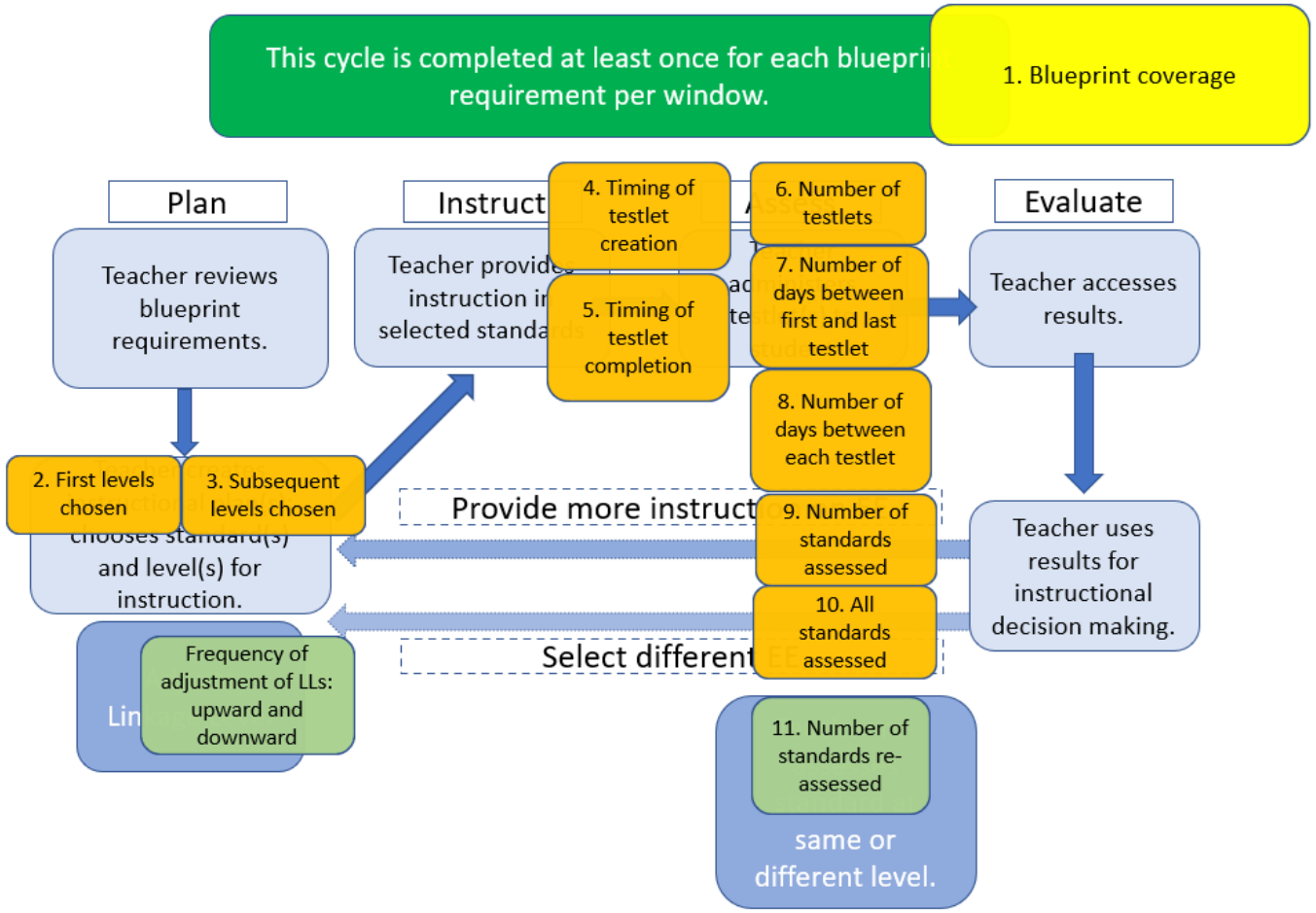


Accessible Teaching, Learning, & Assessment Systems

THE UNIVERSITY OF KANSAS
Achievement & Assessment Institute

Step	Century et al. (2010) critical component	Description
Plan	Structural–procedural	Completing blueprint requirements and creating instructional plans
	Instructional–pedagogical	Adjusting levels for assessment
Instruct	Instructional–pedagogical	Providing instruction on selected standard(s)
Assess	Structural–procedural	Administering assessment(s) according to published procedures
Evaluate	Instructional–pedagogical	Viewing reports and using results to make instructional decisions
Re-Assess	Structural–procedural	Administering assessment(s) according to published procedures
	Instructional–pedagogical	Choosing to re-assess students at the same level or a different level to assess mastery or progress
Outside system	Structural–educative Instructional–student eng.	Completing required training to administer assessments

STEP 2: IDENTIFY PROCESS DATA & INDICATORS



Accessible Teaching, Learning, & Assessment Systems

THE UNIVERSITY OF KANSAS
Achievement & Assessment Institute

STEP 3: IMPLEMENTATION FIDELITY CRITERIA

Implementation Level	Criteria
1	Blueprint coverage not met
	All assessments assigned and completed within one week
	All possible content standards assessed
3	Met or exceeded blueprint coverage
	Time between first and last assessment is at least 60 days
	Median days between assessments suggests adequate time for instruction
	At least one content standard is re-assessed

STEPS 4-5: ANALYSES & REFINEMENT

- Steps 4 and 5 conducted in tandem in a few iterative cycles.
  - Conducted first round of analysis on the indicators, presented findings to our TAC and received feedback.
  - Revised indicators and criteria and ran additional analyses.

STEPS 4-5: ANALYSES & REFINEMENT

- Data from the DLM for the fall 2019 administration
  - 14,021 students in grades 3-11
  - 4,505 teachers
- Descriptive statistics for the indicators by implementation level
- Effect sizes and odds ratios for pairwise mean differences in indicators

STEPS 4-5: ANALYSES & REFINEMENT

- 31% in Level 1, 68% in Level 2, and 0.5% in Level 3.
- Larger percentage in Level 1 in math compared to ELA.
- Many of the indicators differentiate the three implementation levels according to our hypotheses.
  - Level 3 - greater number of assessments, longer testing window, more spacing between assessments and more frequent re-assessment.
  - Level 1 - most likely to complete all testing in either the first or last 20% of the assessment window and least likely to meet threshold for median days between assessments.

STEP 6: EVALUATE STRENGTH OF EVIDENCE

- Current gaps in the implementation fidelity model:
  - The actual amount of instructional time spent on standards.
  - The extent and ways in which teachers access and use assessment results (Evaluate).
  - The instructional-student engagement critical component.

CONCLUSIONS & NEXT STEPS

- Replicate analyses on future years' data and continue to refine indicators
- Explore alternative hypotheses
- Develop profiles of instructionally embedded assessment use
- Explore relationships of implementation fidelity to student outcomes
- Collect qualitative data to examine teachers' assumptions, motivations and rationales

Thank you!

Contact me at:

jennifer.kobrin@ku.edu

Accessible Teaching, Learning, & Assessment Systems