



RECOMMENDED PRACTICES FOR THE EVALUATION OF ADAPTIVE INSTRUCTIONAL SYSTEMS

Evaluate and critique descriptors that are needed to inform AIS buyers about different AIS capabilities

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Common definition of AISs

Issue: No clear, common definition of AIS, which can range from very simple to very complex adaptations.

Recommendations:

- Construct descriptors based on the common AIS model being developed
 - IEEE AIS Standardization Group
- Construct descriptions at various levels of abstraction
- Take a user-centered approach
 - Learn how users conceptualize AISs and talk about their value and capabilities
 - Relate descriptors to terminologies, language and theories deeply familiar to educators

Framing AIS capabilities: Example

	Instructional Strategies ...	In GO Math! ...
1	Establish mathematics goals to focus learning. Effective teaching establishes clear goals, situates goals within learning progressions, and uses the goals to guide instructional decisions (NCTM, 2014, p. 12).	The goals are clearly labeled in HMH GO Math! More importantly, the scope and sequence have been built around learning progressions and the big ideas of mathematics.
2	Implement tasks that promote reasoning and problem solving. Effective teaching engages students in solving and discussing tasks that promote mathematical reasoning and problem solving and allow multiple entry points and varied solution strategies (NCTM, 2014, p. 17).	The 5E lesson framework in HMH GO Math! helps ensure that students explore worthwhile activities in every lesson to develop their understanding of mathematical concepts.
3	Use and connect mathematical representations. Effective teaching engages students in making connections to deepen understanding of concepts and procedures and as tools for problem solving (NCTM, 2014, p. 24).	Students interactively explore new concepts using multiple representations, a variety of tools, and models in order to achieve proficiency with symbolic mathematics.
4	Facilitate meaningful mathematical discourse. Effective teaching facilitates discourse among students to build shared understanding by analyzing and comparing student approaches and arguments (NCTM, 2014, p. 29).	Math Talk is a central feature of HMH GO Math! Question prompts and sample dialogue in the Teacher Edition support you as you engage students to develop mathematical understanding.
5	Pose purposeful questions. Effective teaching uses purposeful questions to assess and advance students' reasoning and sense making (NCTM, 2014, p. 35).	The Teacher Edition has many question prompts that you can use to generate mathematical discourse and determine what students currently know, and advance their learning. These prompts allow you to transform your lessons into an interactive, student-centered learning experience.

Map its features to learning science guidelines that are familiar to educators

Framing AIS capabilities: Example

FIGURE 4.16

DOMAIN 3: INSTRUCTION				
Component 3e: Demonstrating Flexibility and Responsiveness				
<small>Elements: Lesson adjustment • Response to students • Persistence</small>				
ELEMENT	LEVEL OF PERFORMANCE			
	UNSATISFACTORY	BASIC	PROFICIENT	DISTINGUISHED
Lesson adjustment	Teacher adheres rigidly to an instructional plan, even when a change is clearly needed.	Teacher attempts to adjust a lesson when needed, with only partially successful results.	Teacher makes a minor adjustment to a lesson, and the adjustment occurs smoothly.	Teacher successfully makes a major adjustment to a lesson when needed.
Response to students	Teacher ignores or brushes aside students' questions or interests.	Teacher attempts to accommodate students' questions or interests, although the pacing of the lesson is disrupted.	Teacher successfully accommodates students' questions or interests.	Teacher seizes a major opportunity to enhance learning, building on student interests or a spontaneous event.
Persistence	When a student has difficulty learning, the teacher either gives up or blames the student or the student's home environment.	Teacher accepts responsibility for the success of all students but has only a limited repertoire of instructional strategies to draw on.	Teacher persists in seeking approaches for students who have difficulty learning, drawing on a broad repertoire of strategies.	Teacher persists in seeking effective approaches for students who need help, using an extensive repertoire of strategies and soliciting additional resources from the school.

Adapting frameworks such as “A Framework for Teaching” for describing the behavior and value of AISs.

Evidence-based evaluation guidelines

definition of AISs

Issue: AIS systems are evaluated in narrow terms yet marketed very broadly. Guidelines can help vendors present evidence with greater clarity and help users evaluate the evidence.

Recommendations:

- Identify best practices in the field of marketing elearning products in general
- Identify the benefits and concerns that are important to consumers
- Reference and incorporate guidance issued by other government/regulatory/standardization bodies on evidence-based evaluations of educational products.
- Establish guidelines for presenting evidence at different levels of detail and abstraction

Table 1. Summary of Recommended Study Criteria for Each Evidence Level

	Strong Evidence	Moderate Evidence	Promising Evidence	Demonstrates a Rationale
Study Design	Experimental study	Quasi-experimental study	Correlational study with statistical controls for selection bias	Provides a well-specified logic model informed by research or evaluation
WWC Standard	Meets WWC Evidence Standards <u>without</u> reservations (or is the equivalent quality)	Meets WWC Evidence Standards <u>with</u> or <u>without</u> reservations (or is the equivalent quality)	N/A	N/A
Favorable Effects	Shows a statistically significant and positive (i.e., favorable) effect of the intervention on a student outcome or other relevant outcome	Shows a statistically significant and positive (i.e., favorable) effect of the intervention on a student outcome or other relevant outcome	Shows a statistically significant and positive (i.e., favorable) effect of the intervention on a student outcome or other relevant outcome	Relevant research or an evaluation that suggests that the intervention is likely to improve a student outcome or other relevant outcome
Other Effects	Is not overridden by statistically significant and negative (i.e., unfavorable) evidence from other findings in studies that meet WWC Evidence Standards with or without reservations (or are the equivalent quality)	Is not overridden by statistically significant and negative (i.e., unfavorable) evidence from other findings in studies that meet WWC Evidence Standards with or without reservations (or are the equivalent quality)	Is not overridden by statistically significant and negative (i.e., unfavorable) evidence from other findings in studies that meet WWC Evidence Standards with or without reservations (or are the equivalent quality)	An effort to study the effects of the intervention, ideally producing promising evidence or higher, will happen as part of the intervention or is underway elsewhere
Sample Size and Overlap	Includes a large sample and a multi-site sample, overlapping with populations <u>and</u> settings proposed to receive the intervention	Includes a large sample and a multi-site sample, overlapping with populations <u>or</u> settings proposed to receive the intervention	N/A	N/A

Guidelines for evidence-based evaluations

ESEA guidance: Using evidence to strengthen education investments