

ACED 5400 Extract Codebook

Shute, Hansen and Almond (2008; also Shute, Hansen & Almond, 2007) describe an Assessment *for* Learning system called ACED (Adaptive Content with Evidence-Based Diagnosis)¹. ACED was designed to both assess knowledge of algebraic sequences and provide students with practice about algebraic sequences. It offered two experimental tools for assisting learning, both of which could be turned on and off by the assessment administrator: (1) an adaptive sequencing tool which would select items according to their estimated difficulty and (2) an informative feedback tool which provides in depth explanations for problems the student answers incorrectly.

Shute, Hansen and Almond (2008) describe a short field trial of ACED using the portion of ACED relating to geometric sequences. There were a total of 63 tasks in ACED which related to geometric sequences. Shute recruited 268 9th grade students from a local middle school (which did not normally cover geometric sequences in its curriculum). The students were randomly assigned to one of four groups:

1. Adaptive sequencing of tasks and accuracy only (right/wrong) feedback on tasks.
2. Adaptive sequencing of tasks and full (informative) feedback on tasks
3. Linear sequencing of tasks and full (informative) feedback on tasks.
4. Control (student did not use ACED and had an independent study period.)

Most of the student using ACED completed all 63 tasks. Before using ACED the students took a 25-item pretest on geometric sequences and afterwards they took a 25-item posttest. In order to balance the difficulty, two forms were created: Form A and Form B. Half of the students (chosen randomly) got Form A as the pretest and Form B as the posttest, and this was reversed for the other half. The two test forms were then “equated” by scaling the pretest so that the students taking Form A and Form B (which should be equivalent because of the randomization) had the same mean and standard deviation. This same scaling was applied to the posttest results. The final data set reports the scaled pretest and posttest results.

Students in one of the first three conditions (i.e., not the control group) have an additional score as well. This score, called BN_{score} , is the score coming out of the Bayesian network that was used to track student progress in ACED. As ACED is designed to be both an assessment and a learning environment, this score can be compared to the pretest and posttest scores. The Bayesian network score ranges from -1 (low proficiency) to +1 (high proficiency).

During the experiment, students who were classified as English Language Learners

¹ ACED is the brainchild of Dr. Valerie Shute, now at FSU (the ACED work was done while she was at ETS). It was supported by a large cast including: Aurora Graf, Eric Hansen, Jody Underwood, Larry Casey, Steve Landau, Peggy Redman, Waverly Van Winkle, Juan-Diego Zapata-Rivera and Russell Almond (also now at FSU). ACED development and data collection was sponsored by National Science Foundation Grant No. 0313202. More information about ACED is available at the ECD Wiki: <http://ecd.ralmond.net/ecdwiki/ACED/ACED>.

(ELL) were allowed to have assistance from their teachers in translating the English language phrases into their native language. However, observers in the classroom noted that the ELL teachers were also often providing support on the mathematical concepts as well as the language.

The Condition_code and Level_code variable are integer coded. Here are the values

Condition Code	Value	Level Code	Value
1	Adaptive, Accuracy Only Feedback	1	Honors
2	Adaptive, Full Feedback	2	Academic
3	Linear, Full Feedback	3	Regular
4	Control	4	Special Education, Part 1 (Mainstream)
		5	Special Education, Part 2 (Sequestered)
		6	English Language Learners

The fields *pre_scaled* and *post_scaled* refer to the scaled pretest and posttest. The scaling puts the scores in the range 0—100.

The field *BNscores* refers to the score from the internal game (Bayesian network) engine. These range from -1 to 1.

In this data file, the missing data are coded “-999” .

References

Shute, V. J.; Hansen, E. G. & Almond, R. G. (2008). You Can't Fatten A Hog by Weighing It - Or Can You? Evaluating an Assessment for Learning System Called ACED. *International*

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http://www.ijaied.org/iaied/ijaied/abstract/Vol_18/Shute08.html)

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