



*Applying Cognitive Diagnostic  
Models in Schools  
The Teacher Perspective*

**Deborah J. Bartz, UNCG**

**Workshop  
April 24, 2008**



# Outline

- The purpose of this portion of the talk is to summarize the opinions and impact of benchmark that is based on diagnostics modeling.
  - Briefly discuss the current status of testing in the classroom and the possible role of Cognitive Diagnosis Models.
  - Discuss the initial impact of the teachers that were involved.
  - Their general impressions of the required tasks.
  - The usefulness and reasonableness of such a procedure.
- Discuss general comments and future directions

# Currently

- Teachers are bombarded with testing spending a great deal of instructional time administering assessments mandated by the district and the state.
- According to our cohort of teachers, there is little value to the End-of-Course tests in the classroom
  - Tests are administered at the end of the semester and the teacher may not see the data for months (unless the student does not make proficiency).
  - They are only given an overall score (and if they want more, it can be cumbersome to acquire).

# Currently

- The current model of delivering information is that the teacher knows that the student answered correctly 17 of 25 of the items. With only this information the teacher would have no clue what goals/objectives to review.
- Therefore, the teachers we talked to felt that such a procedure could be improved



# Initial Response

- Specifically, teachers were generally excited about the possibility of getting additional information from a benchmark test
- In fact, one of the teachers used the Algebra II benchmark as soon as it was ready.
- However, our cohort of teachers, as with most, was very busy and finding the time to meet was difficult.



# The Process

- Because of the traditional format of tests based on sumscore, there was also a general concern of using cognitive diagnosis.
- We did not want our teachers to feel as though the skill profile was obtained from a “black box”
- So, it was made clear from the beginning that we provide as much detail as needed.



# The Process

- Therefore, we used a “building up” process where the details of the model were given in phases.
  - Initial description of the goal
  - Description of the Q-matrix
  - Description of standards setting
  - Usefulness of the results

# The Process

- In doing so, it was our experience that Algebra II teacher were quick to understand each task.
  - They were generally happy with our presentation style.
  - Although some tasks were time consuming.
- In addition, they were willing to provide feed back along the way



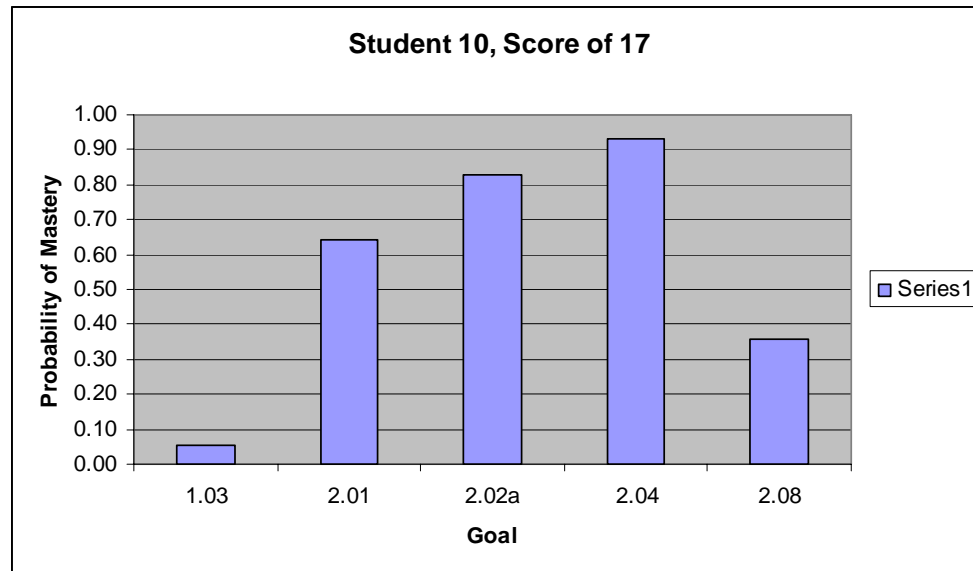
# The Presentation

- In considering our presentation style of the results we rely on a study by Jang, 2004.
- Histograms providing a description of the level of certainty that each skill had been mastered for each student was quickly understood.



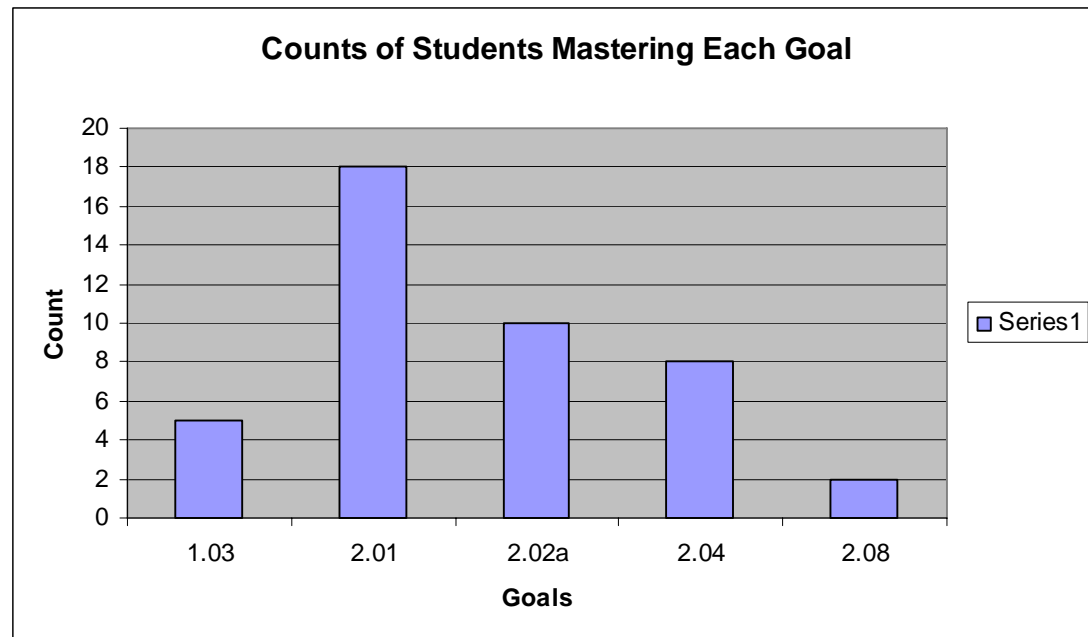
# The Presentation

- Looking at the information provided by the Cognitive Diagnostic Model the teacher will be able to identify the goals/objectives that student 10 has mastered goal 2.02a and 2.04.



# The Presentation

- In general, because of the time constraints placed on our teachers there are limits as to the usefulness of individual information
- Teachers found class information more useful in that class review topics could be easily identified.



# The Presentation

- Finally, teachers were excited about the possibility of relating the information obtained from the benchmark to the End of Course Exam.
- Although, they were concerned with the limitations of the results from End of Course.



# General Comments

- Limitations
  - We use math teacher
    - Use math all of the time
  - Calculators



# General Comments

- Although the county has pacing guides, there is not a mandatory use of the pacing guides in the schools and therefore, content was covered at different points by different teachers
- Teachers often will cover material either the way they were taught or in a way that makes “sense” to them.



# General Comments

- Researchers found differences between teacher content and their perceptions of the content. Is it an Algebra I or Algebra II question?
- Teacher fears of one more test that will evaluate their performance although we are trying to assist in their teaching.

# Future Directions

- Talk about where to go next and what will be done
- Possible improvements on this
- In general, this was a pilot and so it was useful, but...

