Questions and Sample Answers for Chapter 2

Section 1: Questions

Question 1

The following is an excerpt from p.36 of chapter 3. It describes a state benchmark assessment. Identify the seven relevant dimensions for diagnostic assessment (p.12 in this volume) embedded in this benchmark assessment. If you think a particular dimension(s) is not clearly mentioned, make a rational conjecture based on the current convention for the large scale state assessment to answer that dimension.

> The goal of the study was to develop a benchmark Algebra 2 assessment for high school students in an urban school district of a southern state in the United States. The benchmark assessment was administered during the middle part of the school year to allow teachers to understand the strengths and weaknesses of their students. The thought behind the benchmark assessment was to help teachers become better at tailoring their instruction to the needs of their students in alignment with the curriculum and the state standards. As a results they would spend less time on content standards where students had demonstrated sufficient levels of proficiency and would focus more on content standards that students had not yet mastered. Diagnostic assessment items were designed to measure a set of five content standards for this assessment.

1) The object of the assessment:

2) The object of decision making:

3) The time point about which decisions need to be made:

4) The objective of the assessment:

5) The assessment methods:

6) The types of intervention:

7) The power differentials between agents:

Question 2

Which of the following is an appropriate order of the five broad stages of diagnostic psycho-educational assessment?

a. anamnesis, basic diagnosis, differential diagnosis, comprehensive report, evaluation of the suggested treatment

b. comprehensive report, evaluation of the suggested treatment, basic diagnosis, differential diagnosis, anamnesis

c. basic diagnosis, differential diagnosis, anamnesis, comprehensive report, evaluation of the suggested treatment

d. anamnesis, basic diagnosis, differential diagnosis, evaluation of the suggested treatment, comprehensive report

Question 3

Explain the key components of the evidence-centered design (ECD) framework and how it can be used for the design, implementation, data-analysis, and reporting for a diagnostic assessment.

Question 4

For which of the following analysis goals is one likely to prefer a DCM to a model with continuous latent variables?

a. Classification of respondents
b. Statistical development of cut scores from a theoretical distribution
c. Multidimensional scaling of respondent data
d. Modeling the relationship between latent characteristics and observed responses
e. Criterion-referenced interpretation of learner proficiency
f. All of the above
g. None of the above

Section 2 – Sample Answers

Question 1

1) The object of the assessment: The high school students who are being assessed.

2) The object of decision making: From a formative assessment perspective, it is primarily the teachers, who have to tailor their instruction to the students' needs as well as the students who will be influenced by the instruction. From a summative assessment perspective, one could argue that it is the students because they are graded on their progress over the course of the school year.

3) The time point about which decisions need to be made: At the middle point of the school year.

4) The objective of the assessment: To understand the strengths and weakness of the students in order for the teachers to tailor their instruction to the students' needs in alignment with the curriculum and state standards.

5) The assessment methods: Diagnostic assessments whose structure, format, and exact implementation remains unspecified in this description.

6) The types of intervention: A modification of the instructional approach such as the development of new teaching methods or materials to address the content standards on which students did not show sufficient mastery level.

7) The power differentials between agents: Teachers are generally seen as having more power than students since they are the ones who assign grades and make instructional decisions. The framing of the situation as being about learning suggests that a co-construction of instructional decisions could be possible to some degree even though that is unlikely in traditional classroom settings.

Question 2

Correct answer: a

Anamnesis, or the qualitative profile of the object of the assessment (i.e., the student in psycho-educational diagnostic assessment) is the first stage of the diagnostic process. It includes the collection of background information that can be gathered through interviews and record reviews. The second stage is the basic diagnosis stage where the same constructs that were investigated during the anamnesis stage are assessed through individually administered standardized assessments in order to obtain quantitative profiles of the students at a coarser level of grainsize. The third stage is the differential diagnosis stage where constructs are investigated in more detail at a finer level of grainsize. This stage allows the examiner to differentiate between similar diagnoses. The fourth stage is the comprehensive report stage, where the qualitative and quantitative information is synthesized and summarized. Stakeholders such as parents and students may be consulted about the status of the student. The fifth stage consists of the evaluation of the suggested treatment, which allows the examiner to evaluate the suggested interventions, fine tune those interventions, or terminate treatment.

Question 3

The principled design of educational assessments entails evidence-based reasoning. Using Toulmin (1958)'s argument structure, assessment design means specifying the kinds of claims we wish to make, then crafting the operational elements of an assessment that allow us to reason in this manner. Messick (1994) outlines the essential structure:

> A construct-centered approach would begin by asking what complex of knowledge, skills, or other attributes should be assessed, presumably because they are tied to explicit or implicit objectives of instruction or are otherwise valued by society. Next, what behaviors or performances should reveal those constructs, and what tasks or situations should elicit those behaviors? Thus, the nature of the construct guides the selection or construction of relevant tasks as well as the rational development of construct-based scoring criteria and rubrics. (p. 17)

A useful framework for the design and delivery of educational assessments is evidence-center design (ECD). We draw inferences about what students can know or can do in various situations based on their performance in a handful of assessment tasks (Mislevy et al, 2003). ECD adopts a layered approach to assessment development. Assessment is viewed as five coordinated layers of activities, processes, and elements. Most directly related to assessment development are two layers of the framework. The first consists of *Domain Analysis* and *Domain Modeling*, in which the objectives and use arguments for the assessment are developed based on an analysis of the domain within which assessment performance is embedded. Furthermore, the key features of situations and tasks in the domain are specified. The second layer is known as the *Conceptual Assessment Framework*, in which *Student*, *Evidence*, and *Task Models* are used to specify the learner characteristics that one is interested in, the design of the tasks that are used to elicit appropriately targeted behavior from the students, and the rules by which evidence about the characteristics is identified, aggregated, and synthesized. Decisions in these two layers are tied together by the *Assembly Model* and the *Presentation Model*, wherein one specifies how different tasks are sequenced and presented to the learner during the assessment.

Question 1

Correct answer: f

All of the answers *a* - *e* are correct. DCMs are multidimensional measurement models that utilize latent variables for respondents to model the relationship between latent characteristics of the respondents and the scores on tasks that derive from their observed response behavior. Because there are multiple latent-variables scales, the result of this process is akin to a multidimensional profile and because the multiple latent variables are furthermore discrete, the profile leads to a classification of learners into different groups / latent classes, each with its own profile. These classifications can be seen as supporting criterion-referenced interpretations even though one can also argue that they are derived based on estimates of population distributions on the latent-variables, which would support norm-referenced interpretations with a few mastery / disposition level distinctions as well.