Use of Innovative Tool to Develop Test Items and Generate Test Blueprint

Ranier M. Adarve, DMD, MS, MHPE
University of Minnesota
School of Dentistry
Discussion Points

• Test Construction
  ▫ Process
  ▫ Bloom’s Taxonomy
  ▫ Test Blueprint

• The Innovative Tool
  ▫ Simplicity of the Tool
  ▫ Systematic Approach
  ▫ Benefit
Process of Test Construction

Measuring Cognitive Abilities

Write Questions

Retrieve

Store Questions
Bloom’s Taxonomy

Recall
Comprehension
Application
Analysis
Synthesis
Evaluation
Test Blueprint

- also known as test specifications
- Chart / Matrix
- Consists of number of questions and topic / objective
- Ensures coverage of topics and level of objectives
- Study guide for students
Example 1

<table>
<thead>
<tr>
<th>Content Outline</th>
<th>Knowledge</th>
<th>Comprehension</th>
<th>Application</th>
<th>Total</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The student will discriminate the subtraction sign from the addition sign.</td>
<td>1</td>
<td></td>
<td>1</td>
<td>4%</td>
<td></td>
</tr>
<tr>
<td>2. The student will discriminate addition problems from subtraction problems.</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>8%</td>
<td></td>
</tr>
<tr>
<td>3. The student will discriminate correctly solved subtraction problems from incorrectly solved subtraction problems.</td>
<td>4</td>
<td>4</td>
<td>16%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. The student will solve correctly single-digit subtraction problems.</td>
<td>6</td>
<td>6</td>
<td>24%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. The student will solve correctly subtraction problems with double-digit numerators and single-digit denominators.</td>
<td>6</td>
<td>6</td>
<td>24%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. The student will solve correctly double-digit subtraction problems.</td>
<td>6</td>
<td>6</td>
<td>24%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3</td>
<td>4</td>
<td>18</td>
<td>25%</td>
<td></td>
</tr>
<tr>
<td>Percent</td>
<td>12%</td>
<td>16%</td>
<td>72%</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>
Example 2

<table>
<thead>
<tr>
<th>Topics</th>
<th>Recall</th>
<th>Comprehension</th>
<th>Application</th>
<th>Analysis</th>
<th>Synthesis</th>
<th>Evaluation</th>
<th>#</th>
<th>P</th>
<th>Study Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment Planning</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td></td>
<td></td>
<td>9</td>
<td>7</td>
<td>Lectures</td>
</tr>
<tr>
<td>Preliminary Impression</td>
<td>2</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>6</td>
<td>4</td>
<td>Clinical Relevance</td>
</tr>
<tr>
<td>Diagnostic Cast</td>
<td>2</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>6</td>
<td>4</td>
<td>Advance Organizers</td>
</tr>
<tr>
<td>Facebow Record</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td></td>
<td></td>
<td>1</td>
<td>6</td>
<td>4</td>
<td>Discussions</td>
</tr>
<tr>
<td>Articulator</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td>1</td>
<td>6</td>
<td>4</td>
<td>Text Book</td>
</tr>
<tr>
<td>Inter Occlusal Record</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
<td>5</td>
<td>4</td>
<td>Evaluation Rubrics</td>
</tr>
<tr>
<td>Fundamentals of Occlusion</td>
<td>2</td>
<td>2</td>
<td>6</td>
<td>1</td>
<td></td>
<td>2</td>
<td>13</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Diagnostic Wax Up</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
<td>5</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Custom Incisal Guide Table</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Custom Tray</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Silicone Putty Matrice</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vacuum-formed Matrice</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td>3</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL NUMBER OF MULTIPLE CHOICE QUESTIONS</strong></td>
<td><strong>6</strong></td>
<td><strong>18</strong></td>
<td><strong>32</strong></td>
<td><strong>4</strong></td>
<td><strong>10</strong></td>
<td><strong>70</strong></td>
<td><strong>45</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The Innovative Tool

Systematic Test Construction and Banking

Systematic Test Construction and Banking is a computer-based tool designed to assist faculty in the systematic development and storage of paper-based evaluation in the assessment of students' cognitive performance.

Developed By
Ranier M. Adanue, DMD, MS, MHPE
Rashmi Gupta

Version 1.0 © 2008
Menu

1. Course Setup
2. Topic/Content
3. Adding Question
4. Create Test
5. Edit Test Bank
   a. Questions
   b. Topic
Set Up

Enter Course Name: Clinical Fixed Pros

Enter Course Code: Dent 5910

Done  Submit
Write Topic
Write Question

The following are some examples of Fixed prosthodontics service that can be provided for the patient, EXCEPT:

1. Type in the Question

The following are some examples of Fixed prosthodontics service that can be provided for the patient, EXCEPT:

2. Write the options and select correct Answer

   A. single crown
   B. Fixed Partial Denture
   C. Implant
   D. Immediate Denture
   
   [Radio buttons for A, B, C, D]

3. Tag the Question

   Topic:
   Bloom Taxonomy:
   Overview of Pros
   Comprehension

   [Radio buttons for Topic and Bloom Taxonomy]
Create the Test

1. Choose the Course
   - Dent 5910

2. Select the Topic
   - Impressions
   - Overview of Pros

   Add ->  <- Remove

Submit

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Create the Test

Image of a software interface for creating a test, including options to select topics, taxonomies, and view questions in the test bank.

3. Select Topic: Application
4. Select Taxonomy: Knowledge
5. Enter Number of Questions on selected Topic/Taxonomy
6. To add more questions, repeat steps 3 to 5
7. View Blueprint

Available number of Questions in the Test Bank:
- **Application**: 1
- **Comprehension**: 1

University of Minnesota

Ranie Adare DMD, MS, MPH and Raehm Gupta
Generate Test Blueprint
1. Which articulator is more anatomically correct?
   a. Arcon
   b. Non-arcon

2. Which component or components of the articulator influence the direction of jaw movements?
   a. mechanical guide table
   b. condylar housing and flat incisal guide table
   c. condylar housing and mechanical guide table
   d. centric latch and incisal guide pin

3. Custom incisal guide table is fabricated for the purpose of which of the following listed below?
   a. having left and right lateral check bite
   b. having the record of canine-guided occlusal scheme
   c. having a protrusive record
   d. all of the options

4. To avoid tissue injury, the borders and peripheries of the tray should be rounded and smoothed.
   a. True
   b. False

5. Which is NOT associated with the feature of a good diagnostic cast?
   a. accuracy
   b. undersized
   c. overextended
   d. adequate base height

6. When adding the base, the optimal Occlusal plane orientation of the diagnostic cast should be
   a. positive tilt
   b. parallel
Benefits

• One place for all your questions
• Categorize questions by topic
• Easy retrieval
• Easy to create test
• Better communication with students
• Guide students in their studying
Thank You