PROBLEM STATEMENT

- Classroom assessment is integral to the teaching-learning process (Popham, 2002)
- Teachers rely on data from their own assessments to make decisions (Macellani, 2004)
- Teachers often overestimate the quality of their own assessments (Oescher & Kirby, 1990)
- Strategies used to construct quality tests have received little attention in the empirical literature.

CONCEPTUAL FRAMEWORK

Cognitive Strategies
- Are a “special form of procedural knowledge that can exist in varying degrees of generality or separation” (Alexander & Judy, 1988, p. 376)
- Experts engage in an array of strategies that facilitate competent performance (Alexander et al., 2004)
- Strategies consciously used by proficient learners can be understood and taught to learners who demonstrate less competence (MacArthur, 2012)
- Strategies for learning and engagement in academic domains have been identified through:
  1. the close review of expert performance (e.g., Pressley & Afflerbach, 1995)
  2. the application of learning theories (e.g., Nussbaum, 2008)
  3. observing learners in the domain (e.g., Siegler, 1996)

Classroom Assessment Strategies
- In research the emphasis has been on feedback (e.g. Hattie & Timperley, 2007) and formative assessment (Black & Wiliam, 2009)
- Recommendations for test construction relied on “rule-of-thumb” suggestions (Millman & Greene, 1993)
- We argue that classroom tests should have reasonable evidence of test content and response process (AERA, APA, NCME, 1999)
- Table of Specifications (TOS) can be used to provide stronger evidence for test validity when used by preservice teachers (DiDonato-Barnes et al., 2013; Fives & DiDonato-Barnes, 2013)
- Decision making relies on a close review of the tasks to be assessed, alignment to learning objectives, knowledge of content and response process of the test, and personal beliefs and preferences (Glaser & Strauss, 1967)

RESEARCH QUESTIONS

RQ 1: Do pre-service teachers use strategies in the selection of items to include on an end of unit test?

If our analyses revealed strategy use we pursued two follow-up questions:

RQ 2: What strategies are used?

RQ 3: How does strategy use differ among pre-service teachers who received instruction on the TOS versus those who did not?

METHODS

Participant Pool: Data from larger study (DiDonato-Barnes et al, in press)
- Undergraduate ed. psych students assigned to Informed (n=28) or Uninformed (n=25) group
- Informed participants read an article on the TOS before starting the task
- Test Construction Task (see Figure 1)
- Class materials for a 5th grade Social Studies Unit and Test Bank
- Required to select 10 items to assess unit provided

Participant Selection: Participants (n=8); 4 each condition with two high and two low scorers

Analysis: All responses transcribed and coded using Nvivo, Modified grounded theory using a recursive constant comparative method and theme development (Glaser & Strauss, 1967)

RESULTS

RQ1: Do they use strategies? To determination strategy use:
- We inferred a repeated explanation as “strategy use” if it was used consistently (70% of the time)
- We calculated the percentage of use of each participants top two strategies by summing them and dividing by total strategies used
- Participants used the same 1-2 explanations at least 70% of the time, therefore they were using strategies.

RQ2: What strategies do they use?

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item-to-Test Relationship</td>
<td>Referred to other items selected for the test already as part of the decision making process</td>
<td>“Already had a map question no need to overdo it”</td>
</tr>
<tr>
<td>Content Covered</td>
<td>Referred explicitly to subject matter included in the teaching materials</td>
<td>“It tests the students’ knowledge of the Powerpoint”</td>
</tr>
<tr>
<td>Cognitive Level of Items</td>
<td>Referenced the item’s cognitive level (low or high) as a rationale to include or exclude an item</td>
<td>“Because this asks a question based on what students know but also forces them to think critically rather than just repeat a definition.”</td>
</tr>
<tr>
<td>Class Time</td>
<td>Time spent in class (according to the lesson plan) on instruction was taken into account</td>
<td>“There was not enough time spent in class on the geographic factors of the southern colonies”</td>
</tr>
<tr>
<td>Alignment to learning objectives</td>
<td>Described the alignment of the item to a learning objective from the lesson as a rationale.</td>
<td>The colonization of Carolinas was not included in my TOS so it does not seem applicable for the test.</td>
</tr>
<tr>
<td>Personal Beliefs and/or Preferences</td>
<td>Used personal beliefs or reactions to the items, in terms of structure (item is tricky) and content (content is not important).</td>
<td>“Personally I did not like the question”</td>
</tr>
</tbody>
</table>

RQ3: Who used which?

<table>
<thead>
<tr>
<th>Strategies for Decision Making</th>
<th>Informed</th>
<th>Uninformed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alignment to learning objectives</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>Cognitive Level of Items</td>
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</tbody>
</table>

DISCUSSION/CONCLUSIONS

- Strategies used by all may be central to the task of test construction but not sufficient
- Working memory may be needed to manage the core strategies or novice test writers may rely on less effective strategies (personal opinion)
- Some novice test constructed good tests without the benefit of instruction but most could not
- Novice teachers who constructed tests with content and response process validity evidence used strategies
- Novice test writers would most likely benefit from explicit instruction on core and sophisticated strategies for developing high quality classroom tests
- The development of clear and easy to use tools to facilitate test construction activities could support the working memory of novice and practicing teachers

Informed and Uninformed Novices' Test Item Selection Strategies
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