

**Darken the Bubble Completely:
Lessons learned during an unplanned busmen's holiday**

*John Poggio and Doug Glasnapp
Center for Educational Testing & Evaluation
University of Kansas*

In late July/early August 2002 as we began to wind things down for a week or two, out of town with family and friends doing all manner of things NOT related to assessment, we came upon a significant problem with student data captured on answer sheets used during the spring 2002 Kansas assessments. It took the better part of August, but we did locate the problem and correct it before score reports were finalized and “officially” released to Kansas schools in September. So that you know about that problem before we move on to the point of this paper, it turns out that of the approximate 400,000 total reading, writing and mathematics student answer sheets produced for the spring 2002 Kansas assessments, about 4000 of those, when printed by the answer sheet vendor, were not properly aligned on the sheet (timing marks and bubbles not positioned in correct/expected alignment with the leading and side edges of the answer sheet document page) which resulted in “incorrect scanner reads” of those answer sheet documents (the printing error resulted in lower scores for any student responding on a bad form). From study and analysis, the printing problem was limited to the reading assessment forms, could have impacted a student at any specific grade, and the badly printed forms were distributed in “pockets,” thus only a handful of buildings were impacted. While the problem and identification are stated completely in the preceding two sentences, it took four weeks, 8 to 12 hours workdays, six days a week for about five professional staff and one clerical aide to work through everything to identify the problem and effect the needed changes. So much for a vacation not involving assessment!

It is what we learned in the hours spent pouring over student response forms working to discover and uncover the source of the error that we want to bring to your attention. Many Kansas schools go to great lengths to maximize student performance on the state assessments. From what we have observed, we need to advise local (building and district) staff to take additional steps to assure proper marking of response forms by students. We estimate that in some locales increases in performance will result if additional attention is given to assure appropriate and complete student marking of the answer sheet. What follows are steps that should be given local attention, before, during and following testing, and before documents are returned to CETE for processing. (And, there is no reason to believe the problems we observed are unique to the Kansas assessments; you should consider what follows as applicable to all standardized tests your student take.)

1.

Locally address student motivation to do well. While motivation is not a major deterrent to performance in many Kansas schools, we did observe many occasions where examinations are not complete, answer sheet markings suggest the assessment is not taken seriously (e.g., a response pattern of: A, B, C, D, A, B, C, D, A, B, etc.), or answer markings are not completed beyond the first few items. At a minimum we strongly advise a few positive, encouraging and supportive words from local administrators, counselors and instructors which should help tremendously. In a paper titled, **“Motivation, Rewards and Consequences: Local efforts to support and encourage schools and students to maximize performance on the Kansas assessments,”** approaches to student and staff motivation that are being implemented by many Kansas schools are presented (the paper is available through our web site: . We recommend your consideration of this paper which covers procedures and policies being implemented in many Kansas schools and districts. While motivation as a problem does not appear to be widespread, know that it is in some schools, that poor motivation limits the scores for some students, and in some locales it definitely requires attention. There is evidence that praising effort and encouraging positive participation pays dividends. If you are not actively attending to motivation, you may want to do so.

2.

From students’ patterns of responses which we observed, some time spent in schools discussing test taking strategies with students is well warranted and strongly advised. In fact, we are of the opinion that schools need to invest time discussing (formally) test taking behavior and strategies with students. We noted considerable numbers of items being omitted on student response forms. Remember, a student’s score is the number of items answered correct, so even guessing at the end of an exam is a “good behavior” (research shows that partial knowledge, the ability to disqualify one or two alternatives, improves scores well beyond chance). Also, not returning to passed-over/skipped items, etc. is again very much a local matter that someone should discuss with students. How to take a standardized test should be a periodically reviewed topic. A paper on test taking strategies is being prepared at CETE for distribution in late February 2003 (it will be available on our web site).

3.

Students need to follow the rule that answer sheet “bubbles” need to be filled completely. In some schools this lesson is clearly followed; in many others there is no attention to this “rule”. Marks that do not fill the circle can be scanned as “no response made” (which results in an incorrect judgment by the hardware). “Donuting” (students’ marks appears to ring the circle, but the center is left unmarked) is another problem that can lead to “no mark” being sensed/seen by the scanner. Remind students of this basic premise: if they do not mark their answers properly, then the door is open for mis-reads during scanning. Scanning technology is not foolproof. We think you should do some practice testing with students using response forms (a copy of ours or some other), and those who do not properly mark the bubbles need “remediation.” Help them to help themselves. We also recommend that following testing, local office staff review answer sheets of students and completely “fill-in” bubbles that are only partially filled or very lightly marked. Thus the obvious questions: When in doubt what do we do, and how far do we go. CETE’s answers: When in doubt, do nothing. Do not attempt to discriminate when a student has “multi-marked” an item. Or has marked so faintly that you cannot discern what was intended.

4.

Even when bubbles are filled completely, marks that are light will be missed. The rule is this, if you can see the letter choice after the bubble has been marked, the mark is too light. Again, work with students to change this “light marking behavior”, and if after the exam you wish to

assure bubbles are darkened, do so. Again, do not make discrimination judgments trying to resolve the thorny issue of multiple marks, erased marks, uncertain markings, etc. The rule is, when the student erases, then s/he needs to erase completely (another test taking tip to review with students). If you are trying to clean up response forms locally, when in doubt, do nothing – the student’s response stands.

5.

After testing, someone needs to review all response forms and along with suggestions #3 and 4 above, also clean up stray marks. Stray marks (e.g., a line that runs across the page) to a scanner (when the mark/line runs through/across bubbles), look like “multiple responses” to an item and in these cases, answers are scored incorrect automatically. (The scanner does not see a careless line on the sheet; what it looks for and “sees/senses” are the bubbles associated with a specific item number that have marks appearing in them -- and it automatically registers the item response as incorrect.)

6.

Check student pencils. The rule to use only dark Number 2 pencils is very, very real. Low lead pencils (Numbers 3 and higher) open the door to reduced scanning accuracy. We saw some of this, so it is real. If a student is not using a number 2 pencil, there could be a problem resolving accurately her/his item responses. The scanner does not pick up low lead marks, and the scanner misses pens, ballpoint and felt tip, roller ball ink marks altogether. Students must use No. 2 pencils...period.

7.

Examination proctors need to remind student during testing to check and make certain that when items are skipped and that their responses do not get “out of alignment.” For example, item 7 is skipped (not marked on the answer sheet), but inadvertently when the student answers question 8, the answer is recorded into answer position 7 and the problem continues. It happens, it is real, and it results in low scores. We observed cases where the student discovers the problem, but rather than return, erase and correct the short series of “offset marks” they correct only at the point of the discovery and continue. Again, it is a test taking skill that students must be made aware of and remember to check for themselves. (Marking their answer choices in the booklet is a good way for students to track and verify their response pattern.)

8.

During testing as each test session nears its end, remind (and encourage) students to return to items they did not answer/mark. We see lots of omits in the middle of test sections; omits are scored wrong. This is a test taking skill, and it needs to be taught. Seeing lots of “middle of the exam omits” might also be a signal of poor motivation (“I don’t know this material, why should I try,” “I’ll just move on to get done,” etc.) and a self imposed attitude of not trying “hard.” Attempting all items, even once it comes down to a “guess” is an OK behavior. The assessment research literature strongly supports this behavior. What the literature has demonstrated is that partial knowledge is very real, accurate and dependable, and students need to be advised to rely on it to guide a final response choice (i.e., the strategy is to eliminate a choice or two, then guess among the remaining choices; even when no choices can be eliminated, guess!).

9.

Related to #8, but independent of it, many students seem to run out of time leaving some of the last items on an assessment section blank. First, the assessments are meant and designed to be administered without rigid or fixed time limits. Students who are making a good faith effort should be allowed to continue taking the assessment section after the scheduled time has expired. Be advised, if you are setting fixed time limits that are below our recommended suggestions (provided in the Examiner's Manual), some students may have a difficult time completing a section. We have observed classes of students where a test section is not completed by many students. Also, examination proctors need to announce when the last 10, 5, 3, 1 minutes of the test session remains. Test taking strategy guidance sessions need to advise student to mark a response to all items not attempted before time runs out -- so to be sure to always allow the time as needed to complete marking a response to all items. (Remember, students are not permitted to return to omitted items from a prior section once the test session (section) has ended.)

10.

Students need to be told to respond to all questions in a test section until they come upon the STOP: DO NOT PROCEED notice in the booklet. We found numerous (at truly amazing rates) students who did not respond to the last questions on the last page of a section. This was especially true when the last test section presented items on the very last page of the test booklet (i.e., on the back cover). Proctors need to be attentive, and students need to be reminded to turn the pages responding to items until they come upon the STOP message printed in the booklet for that section.

11.

We have observed that the student demographic/personal data is often incomplete. This information is vital to all manner of accountability evaluations; preslugging can solve some of this, but someone needs to assure that questions about race, time in school/district, gender, poverty, migrant, lunch status, etc. are completed and completed accurately.

12.

Do not return the blank answer sheet for a student who has moved.

13.

Do not return a general assessment answer sheet for a student who is taking the Alternate Assessment.

14.

Do not return the answer sheet for a student who changed grade classification at a December/January/February semester transition.

15.

Foreign exchange students are not to be tested, and if they are (a local decision), do not return their answer sheets for state processing and scoring.

Some of the above are addressed in the Examiner's Manual that is provided for each assessment; and all assessment manuals detail procedures for test administration, answer

sheet usage, and final processing. The preceding suggestions go beyond most of these treatments, and we strongly recommend attention to these particulars as may be appropriate and useful in your local school(s). What was once seen to be a nasty, even rude external imposition has become a major component of schooling (accountability founded firmly on the performance of students on the state assessments). Lowered scores do result due to a student's poor motivation, failure to mark an answer sheet properly, or a lack of test taking skills or poor test taking strategies.

Consider also this: if students are responding to the state assessments inappropriately or incorrectly, this is probably also happening when they sit for the off-the-shelf commercial tests you administer such as CTB, ITBS, MAT, SAT, NAEP, ACT, SAT, etc. We know, based on our "hand" review and inspection of many thousands of response forms these issues are real; we also would mention that some local schools are very attentive to many of these sources of error in the measurement process. Many others are not. The intent of this paper is to alert you to these sources of potential error that could suppress your schools' true test scores. The decision to attend to any of them is yours, but given the current use of test scores for school accountability, any appropriate effort to maximize scores by minimizing these potential errors would seem to be wise.