

**Consequential Validity of the Kansas Computerized Reading and  
Mathematics Assessments: Educator Perspectives**

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**October 2008**

## **Introduction**

The Kansas Assessment program, comprised of both computer based and paper and pencil modes of testing, is designed to meet and exceed the requirements of the federal No Child Left Behind Act. The Kansas Computerized Assessment (KCA) project provides not only the online testing interface for students, but also online training tools, tutorials, and both practice and formative tests for each subject area to educate and prepare school personnel and students for online testing (<http://kca.cete.us/>). Beginning in the spring of 2003, all necessary software applications were developed to provide, on a voluntary basis, opportunities for Kansas schools to participate in the implementation of the reading and mathematics assessments. This computerized based testing (CBT) model is delivered via the internet in real time and provides security features (local registrations, test session tickets, redundant backup systems, load managing software, scheduling, reactivation options, etc.) to assure an accurate and standardized assessment.

The purpose of this report is to shed some light on any positive and negative consequences of the Kansas online computer testing system from a consequential validity perspective (Messick, 1989). Practicing Kansas educators shared their perceptions about KCA's impact on technology used in the classroom and on instructional modifications as a result of having formative and summative student results readily available for administration and review.

## **Research Design**

During a standard setting meeting for the general assessment and the Kansas Assessment of Multiple Measures (KAMM) conducted during the summer of 2006, a group of Kansas educators (e.g., administrators, school faculty, and district test coordinators) were asked to provide information for two self-report questionnaire items regarding KCA and its relationship to technology and instruction in the classroom. The participants were selected based on factors such as grade and content area of primary instruction, geographic location, school size, and years of experience teaching in Kansas. Efforts were made to select a group of individuals that would represent all demographic characteristics of educators in the state. From the 292 standard setting participants, 166 (57%) responded to the two self-report questions and shared any additional comments that they felt would be helpful in understanding the utility of KCA in the classroom. Personal and building demographic characteristics of the respondents and those participating in the standard setting are provided in Appendix Tables 1 and 2.

## Results

Technology is becoming more and more commonly used everywhere, including the classroom. Participants were asked on a 3 point scale to rate the level of impact that KCA had on his or her use of technology in the classroom regarding instruction and student learning. Figure 1 presents one of the two questions asked and a description of each level of impact the participants could choose from.

Figure 1. Questionnaire item assessing KCA's level of impact regarding the use of technology and instruction in the classroom

<b>Due to computerized testing via KCA being offered in Kansas, what impact has it had on <u>you</u> as a classroom teacher?</b>	
<b>A) A significant impact</b>	I use technology more in my instructional units knowing that students use computers and other technology for learning outside of school and are aware that they will be tested via computer for the Kansas assessments.
<b>B) A moderate impact</b>	I have started to take advantage of technology in my classroom and realize the power and potential of computers as tools for learning.
<b>C) Little or no impact</b>	Computerized testing via KCA has not impacted my instruction in any noticeable way.

As shown in Figures 2 and 3, a majority of participants (> 80%) agreed that the use of computers in the classroom did influence their instruction, with approximately half rating the level of impact as *significant* and half rating the level of impact as *moderate*. These ratings did not differ by content area taught, [ $\chi^2$  (6, N = 161) = 2.42,  $p$  = .877], nor by grade level of the building in which the participants taught, [ $\chi^2$  (4, N = 161) = 4.24,  $p$  = .375].

Figure 2. KCA's perceived level of impact regarding technology and instruction on the classroom teacher by content area taught

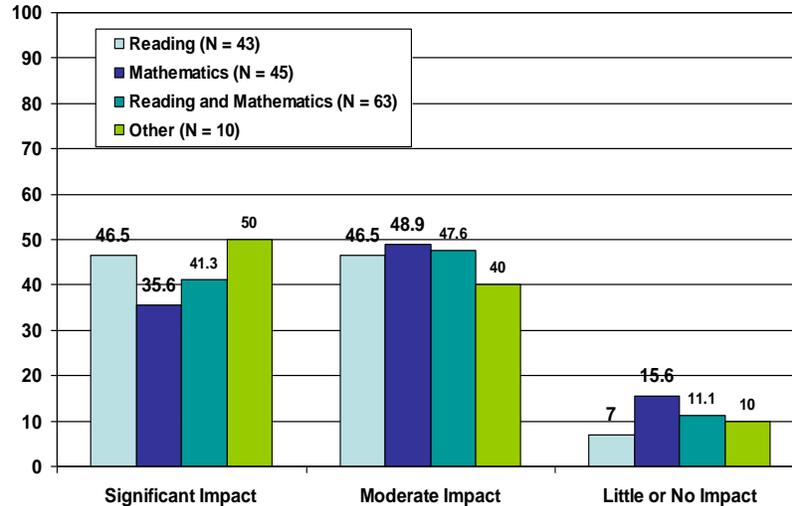
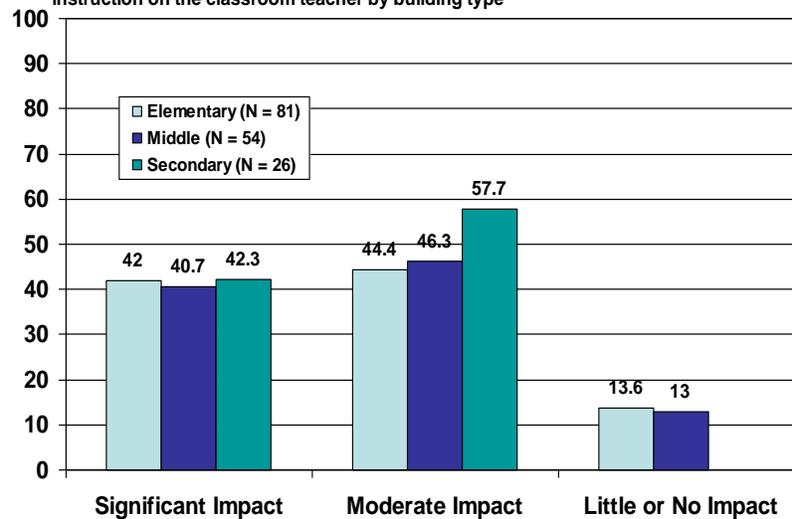


Figure 3. KCA's perceived level of impact regarding technology and instruction on the classroom teacher by building type



In addition to responding to the 3-point scale, teachers were given the opportunity to provide further comments regarding this issue. Although few teachers (11%; N = 17) chose to provide feedback, additional useful information was gathered. Of those that responded that KCA has made a *significant impact* on the classroom (41%; n = 7), both time away from instruction and students associating computers with testing were noted as negative consequences of the assessment system. Also noted as a positive consequence

was that the option of using the formative assessment component allowed for more individualized instruction. The most common comment for participants endorsing a *moderate level of impact* (29%; n = 5) was related to the lack of technology in the building (e.g., lack of computers or lack of instructional material that could be used with computers). Other comments focused on the belief that technology diminishes the bond or link between the teacher and the student. Lastly, when participants viewed KCA as having *little or no impact* on the classroom (29%; n = 5), comments stated that the number of students far outweighed the number of computers, and therefore access was very limited. Two participants also noted that their buildings chose to use paper and pencil versus a computerized mode of testing. In general, regardless of level of impact endorsed, it appeared that it was not necessarily the use of KCA that impacted instruction but rather other factors related to the advantage of having technology available in the classroom as many participants noted that they were already using some form of technology in their classrooms prior to KCA being implemented when that technology was available.

Not only were participants asked about KCA's impact on the classroom they were also asked to rate the level of impact that KCA has had on their building in regard to the administration encouraging the use of technology in the classroom. This question and its answer options are provided in Figure 4.

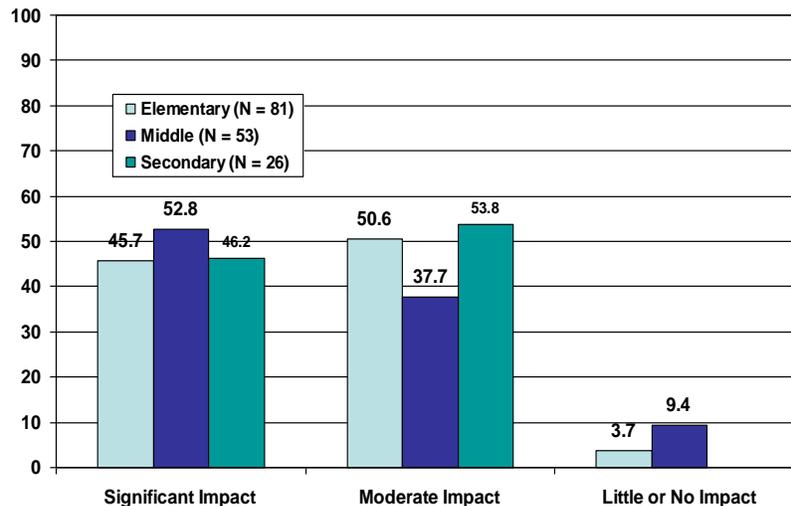
*Figure 4.* Item assessing KCA's level of impact regarding the use of technology and instruction in the building

<b>Due to computerized testing via KCA being offered in Kansas, what impact has it had on your building?</b>	
<b>A) A significant impact</b>	Teachers are encouraged to use technology in delivering instructional units and my school has purchased more computers for school use.
<b>B) A moderate impact</b>	The benefit of the KCA system is known, but teachers are left to their discretion whether or not to use technology in the classroom.
<b>C) Little or no impact</b>	Teachers are encouraged to not use technology in the classroom and no computers for student use are available.

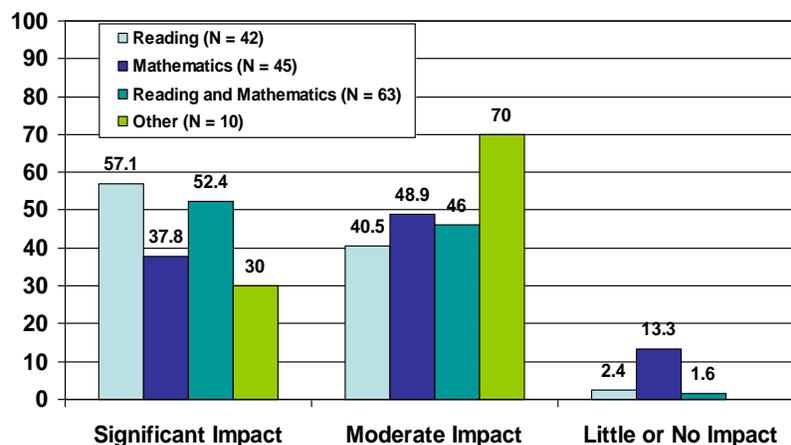
No relationship was found between level of impact and grade level of the building, [ $\chi^2$  (4, N = 160) = 5.48,  $p = .242$ ] with over 90% of respondents rating the level of impact KCA has had on their building as *moderate* or *significant* (Figure 5). However, for content area taught, an overall relationship was found with level of impact, [ $\chi^2$  (6, N = 160) = 12.98,  $p = .043$ ]. Similar to the previous findings, over 95% of those teaching reading, those teaching reading and mathematics combined, and those classified as "other" noted that the level of impact on their building was *moderate to significant* (Figure 6). In contrast, almost 15 percent (13.3%) of mathematics teachers felt that KCA had *little to no impact* on their building. Regarding whether KCA had any impact on the building in which they taught, further investigation revealed that mathematics teachers

differed in their opinions from those teaching both reading and mathematics [ $\chi^2(2, n = 108) = 6.84, p = .033$ ] but not from those who taught only reading or who classified themselves as “other,” [ $\chi^2(2, n = 87) = 5.31, p = .07$ ], [ $\chi^2(2, n = 55) = 2.16, p = .339$ ], respectively. The answer to why mathematics teachers responded differently than those teaching a combination of reading and mathematics was not clear and did not emerge when teachers were provided with the opportunity to provide additional comments regarding this issue.

**Figure 5.** KCA's perceived level of impact regarding technology and instruction on the building by building type



**Figure 6.** KCA's perceived level of impact regarding technology and instruction on the building by content area taught



With the aforementioned results in mind, open ended comments regarding KCA's impact on the building and its relationship to technology and instruction was explored. Seventeen of the 160 participants (11%) who provided their perceived level of impact on the building also supplied at least one comment relating to this issue. Of the 8 (47%) responses indicating KCA has made a *significant impact* on his or her building, half commented on the issue of purchasing computers. These comments ranged from the budget being large enough to allow the school to purchase laptops for each individual student to the general lack of funding for buying any computers or other pieces of technology needed in the school. One school was able to apply and receive grant funding for computers largely due to KCA being a mode of assessment used in the building. The remaining responses centered on individual instruction, adjusting lessons to focus on areas of need, and preparing special education students for the online mode of assessment.

For the six participants (35%) indicating KCA had a *moderate impact* on his or her building, the results of the consequences of the online system was mixed. Comments ranged from noting that teachers in the building were encouraged to use technology and that most teachers take advantage by using some form or type of technology in their classrooms to commenting on the frustration due to the lack of choice in the mode of assessment and not having enough computers to efficiently complete the testing protocol. In addition, the use of formative assessments was noted as being used for practice purposes, while no mention was made of how this type of assessment was used to change or modify instruction.

The remaining two responses (12%) for the participants indicating *little to no impact* was also mixed. One participant's school used only the paper and pencil mode of testing and the other response indicated that teachers in his or her building were using technology because the faculty believed it was an effective learning tool, not because KCA was implemented at their school.

## Conclusion

With the increasing number of students in the United States taking high stakes assessments online, it was important to evaluate how instruction within the state of Kansas was being delivered in conjunction with the availability of the computerized assessment system. This information was gathered from perspectives of those responsible for implementing and assisting students at the local level (i.e, classroom teachers). With over 70% of schools in Kansas indicating a majority of their students took the reading and mathematics assessments online, of particular interest in this study was the impact that KCA had on instruction, assessment, curricular planning, and technology in the classroom. In general, regardless of content area taught or the grade level of the building, a majority of participants reported that KCA had a moderate to significant impact on the classroom and the building. Some qualitative data included comments about classes and

schools not having enough technology in general (including computers) to comments that technology was already available in the classroom prior to KCA being implemented in the building or district. However, the data in this study lacks the necessary details to evaluate what type or method of instructional changes, if any, are taking place because of the additional information instantly available to teachers when they take advantage of the components of the KCA system such as the online tutorials and formative assessments. Teachers were provided with opportunities to comment openly on issues regarding their classrooms and instruction and on the relationship both have to KCA. Unfortunately, very few teachers took advantage of this opportunity.

Future studies evaluating the intended outcomes (e.g., enhancing the curriculum, improved instruction, and improved student learning) as well as unintended outcomes (e.g., narrowing of the curriculum, instruction focused on only the test content, and inappropriate test practice strategies) of the Kansas online testing system is needed. A detailed investigation via focus groups, interviews, and classroom observations, etc., all from the perspective of the practicing classroom teacher and perhaps from the perspective of the student taking the assessment, would be valuable and informative to many stakeholders. Ultimately, any insight gained regarding student learning outcomes would be worthy of additional study given the newness and paucity of empirical evidence of high stakes assessments administered online.

## Reference

- Messick, S. (1989). Meaning and values in test validation: The science and ethics of assessment. *Educational Researcher*, 18, 5-11.

## Appendix

**Table 1**

*Participant and Building Demographics of the Consequential Validity Study Sample (N = 166)*

	n	%
Years teaching in Kansas		
1-4 years	8	4.8
5-10 years	37	22.2
11-14 years	35	21.1
15-20 years	33	19.9
20+ years	53	31.9
Subject area taught		
Reading	45	27.1
Mathematics	46	27.7
Reading and Mathematics	65	39.2
Other	10	6.0
Building Grade Level		
Elementary	82	49.4
Middle	55	33.1
Secondary	29	17.5

**Table 2**  
***Participant and Building Demographics of the Standard Setting Sample***  
*(N = 292)*

	n	%
<b>Gender</b>		
Female	261	89.5
Male	31	10.5
<b>Ethnicity</b>		
Caucasian	274	93.7
African American	3	1.0
Asian	2	.9
Hispanic	7	2.5
Other	6	1.9
<b>Position</b>		
Administrator	19	6.5
Coordinator	18	6.1
General Education Teacher	183	62.6
Special Education Teacher	72	24.8
<b>Building Socio-Economic Status</b>		
Mostly Poor, Poverty, Low SES	61	20.7
Mixture of Poor and Middle Income	131	45.0
Generally Middle Income	58	19.8
Mixture of Middle and Wealthy Income	5	1.8
Mostly Wealthy	3	.9
Cross section of All Income Levels	34	11.7
<b>District Location</b>		
Rural Community	119	40.7
Suburban Community	66	22.7
Inner City	31	10.7
Urban Setting	73	24.9
Other	3	1.0