

**Quality and Utility of the Kansas Computerized Assessment System from the
Perspective of the Kansas Educator**

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Introduction

The Kansas Assessment programs, comprised of both computer based and paper and pencil modes of testing, are designed to meet 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 online training tools, tutorials, and 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 schools in the state of Kansas 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 a proper and standardized offering of this assessment.

This report examines perceptions of the utility and quality of the KCA system from the perspective of the practicing Kansas educator using a self-report questionnaire. This questionnaire was designed partially as a means of gathering information regarding potential instructional changes as a function of the advantages of using an online state assessment system where formative as well as summative student results are essentially immediately available for review. Results of this investigation are presented in four broad categories: 1) the increasing use of KCA since its inception; 2) reasons why buildings adopt KCA as a mode of testing; 3) KCA and its relationship to technology in the classroom; and 4) the perceived quality of the KCA system.

Sample Description

Participants were attendees of a Bookmark standard setting meeting for the general and Kansas Assessment of Multiple Measures (KAMM) and were selected by CETE from a pool of 550 nominees. These nominations were made by Kansas educators (e.g., administrators, school faculty, district test coordinators). 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 the demographic characteristics of educators in the state. Within the two content areas of Reading and Mathematics for the general assessments, participants were divided into two groups that were balanced in terms of relevant demographic characteristics. For the KAMM, a similar balance was attempted. Following the standard setting, participants were asked to complete an evaluation of the standard setting procedures and complete a questionnaire regarding the use of the computer based testing system. Participants were also asked to complete a set of demographic questions regarding their personal characteristics as well as that of their district. From the 292 standard setting participants, 166 (57%) responded to the 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 Tables 1.

Overall, 50 of the 296 (17%) districts were represented by the standard setting sample. The majority of the participants was female (89.5%) and Caucasian (93.7%). Almost two-thirds of the sample were general education teachers (62.6%) with almost half of the sample representing elementary (49.4%) and buildings from poor to middle class neighborhoods (45%).

Table 1
Participant and Building Demographics of the Quality and Utility 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

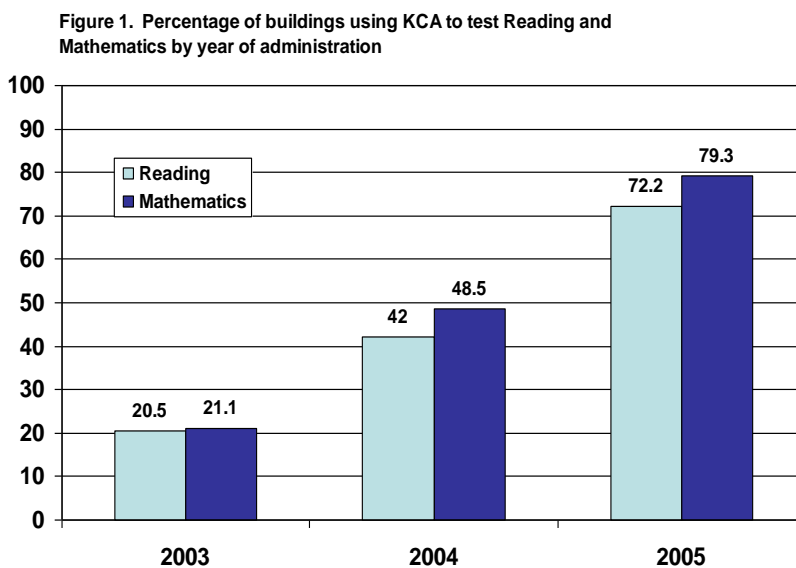
Table 2
Participant and Building Demographics of the Standard Setting Sample (N = 292)

	n	%
Gender		
Female	261	89.5
Male	31	10.5
Ethnicity		
Caucasian	274	93.7
African American	3	1.0
Asian	2	.9
Hispanic	7	2.5
Other	6	1.9
Position		
Administrator	19	6.5
Coordinator	18	6.1
General Education Teacher	183	62.6
Special Education Teacher	72	24.8
Building Socio-Economic Status		
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
District Location		
Rural Community	119	40.7
Suburban Community	66	22.7
Inner City	31	10.7
Urban Setting	73	24.9
Other	3	1.0

Results

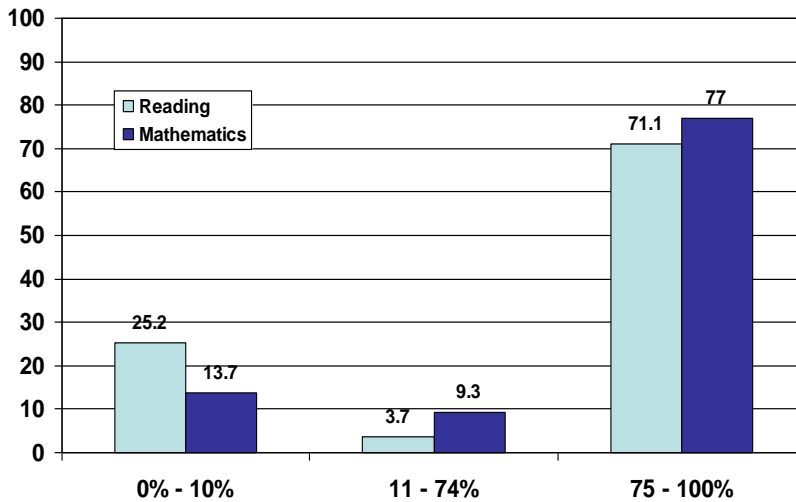
How many students tested via KCA?

Participants were asked to respond to whether or not his or her building tested students in the areas of Reading or Mathematics using the KCA system in the Spring of 2003 to the Spring of 2005. As shown in Figure 1, there was a significant increase in the number of buildings reportedly to have administered the state assessments via the computer in these two content areas over the span of three years with less than one-quarter testing in 2003 and approximately three-quarters testing by 2005. As expected, these percentages did not vary by content area.



In order to gain an estimate of the number of students taking their assessments via the computer, participants were asked to reflect on the percentage of students who were administered the Reading and Mathematics assessments during the academic year they had just completed (Spring 2006). Approximately two-thirds of respondents indicated that over 90 percent of their students were tested using KCA in both Reading (65%) and Mathematics (67%). An additional 6% indicated that 75 to 90 percent of their students used the computer for taking their Reading assessment, while 10% indicated that the computer was used for Mathematics assessments. These percentages, when summed within content area, are shown in Figure 2 and reflect the percentage of buildings in the sample reportedly having 75 to 100 percent of their students tested using KCA. In contrast, less than one-quarter of participants indicated that paper and pencil was the mode of choice for test taking in their building for at least 90% of their students (approximately 75% of participants for Reading and 86% of participants for Mathematics).

Figure 2. Percentage of students using KCA as mode of test administration in Spring 2006 for Reading and Mathematics



To determine whether the difference in method of testing was a function of grade level, mode of use was also examined by building type (i.e., elementary, middle, and secondary). As shown in Figures 3 and 4, the proportion of students being tested via KCA did not differ by building type for Reading [$\chi^2(4, N = 135) = 3.71, p = .447$] nor for Mathematics [$\chi^2(4, N = 139) = 8.58, p = .073$]. Clearly, since its inception in 2003 KCA has become an increasingly popular method of test taking across the state, and for most buildings, the majority of students completed the assessments online versus with paper and pencil.

Figure 3. Percentage of students using KCA as mode of test administration in Spring 2006 for Reading by building type

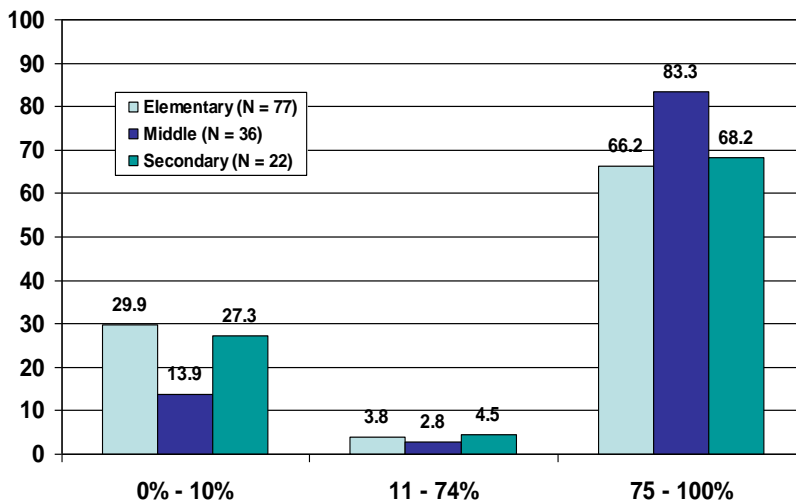
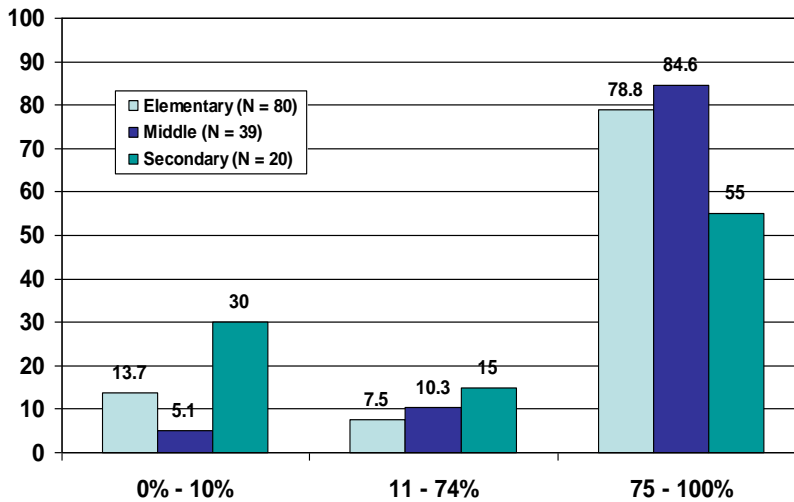


Figure 4. Percentage of students using KCA as mode of test administration in Spring 2006 for Mathematics by building type



Why are buildings using KCA?

Participants were asked to indicate from a list of seven options why their building decided to test students on the computer via KCA during the 2005 – 2006 academic year. Respondents could mark as few or as many reasons as they deemed appropriate and applied to their current situation. Prompt and instant feedback of online student score reports was the most popular reason marked (88.4%), followed by increased student motivation due to their preference of testing via the computer (48.2%), the ease and efficiency of administration over paper materials and answer sheets (47.0%), and taking the summative tests in the same mode as the formative tests (42.1%). Somewhat less important reasons perceived by teachers were increasing the number of computers to make KCA testing practical (32.2%), assessing students in a mode in which they were familiar (29.3%), and because many other schools and districts have transitioned to KCA (15.2%).

When asked to consider which one of the seven reasons was the most important or relevant characteristic of the KCA system, almost 80% (79.9%) of respondents chose the offering of prompt and instant feedback of score reports followed by an increase in student motivation due to their preference of testing via the computer (12.4%). To add to the validity of this finding, an additional question was posed as to whether or not teachers looked at the score reports after their students completed the KCA assessments. Approximately 95% of participants responded that they did view the score reports and this finding did not differ by content area taught, [χ^2 (3, N = 158) = 1.20, p = .754; Reading (95.2%, N = 42), Mathematics (93.3%, N = 45), Reading and Mathematics (96.7%, N = 61), and Other (100%, N = 10)]. However, this proportion did differ by building type with middle schools viewing the score reports the least, [χ^2 (2, N = 158) = 9.33, p = .009; Elementary (100%, N = 78), Middle (88.9%, N = 48), Secondary (96.2%, N = 25)].

One aspect of the score reports is to provide feedback to teachers regarding areas of strengths and weaknesses of their students. When asked if the information contained in these reports were useful in doing so, over 90% of teachers who reported viewing the score reports agreed that they were

helpful in analyzing strength and weaknesses. This agreement did not differ by content area taught, [χ^2 (3, N = 155) = 1.65, $p = .648$; Reading (97.6%, N = 41), Mathematics (97.7%, N = 44), Reading and Mathematics (100.0%, N = 60), and Other (100%, N = 9)], nor by building type, [χ^2 (2, N = 154) = 2.53, $p = .282$; Elementary (100%, N = 78), Middle (98.0%, N = 50), Secondary (96.2%, N = 26)]. When asked if instruction was altered after viewing either the score or indicator reports for an individual student or for the class as a whole, at least 85 percent of teachers stated that they did alter instruction in some form, with the exception of those at the Secondary level where approximately three-quarters reported altering instruction. This pattern of response did not vary significantly by content area, [χ^2 (3, N = 154) = .11, $p = .991$; Reading (87.8%, N = 41), Mathematics (86.4%, N = 44), Reading and Mathematics (88.3%, N = 60), and Other (88.9%, N = 9)], nor by building type, [χ^2 (2, N = 154) = 3.34, $p = .188$; Elementary (89.7%, N = 78), Middle (90.0%, N = 50), Secondary (76.9%, N = 26)]. In addition, all teachers (100%) who noted that they viewed the score reports online rated the information contained in these reports to be either *extremely useful* or *somewhat useful* in relationship to impacting their instruction.

KCA and Classroom Technology

Technology is becoming more and more commonly used everywhere, including the classroom. Participants were asked to rate the level of impact that KCA had on their use of technology in the classroom regarding instruction and learning. As shown in Figures 5 and 6, 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, [χ^2 (6, N = 161) = 2.42, $p = .877$], nor by type of building, [χ^2 (4, N = 161) = 4.24, $p = .375$]. To endorse KCA having a significant impact on the classroom environment meant that the teacher felt many students use computers and other technology for learning outside of school and also that his or her students will be tested via the computer for the state assessments. A moderate impact was defined as the teacher taking advantage of technology in the classroom and has realized the power and potential of computers as a tool for learning. Those choosing the option of little or no impact agreed that computerized testing via KCA had not impacted their instruction in any noticeable manner.

Teachers were provided with the opportunity to respond openly to this question and provide comments. Few teachers (12%) chose to provide feedback regarding this issue. Of those that did, many noted that their school did not have enough computers or technological equipment for all students and therefore their use of technology in the classroom was limited. Others responded that they already used technology in their classroom prior to KCA being implemented in their building. In general, it appeared that it was not necessarily the use of KCA that impacted instruction but other factors related to the advantage of having technology available in the classroom in general.

Figure 5. KCA'S perceived level of impact on the classroom teacher by content area taught

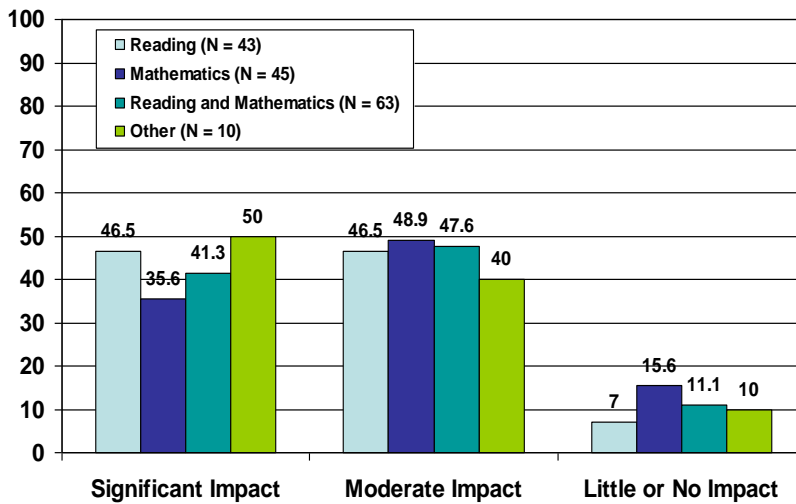
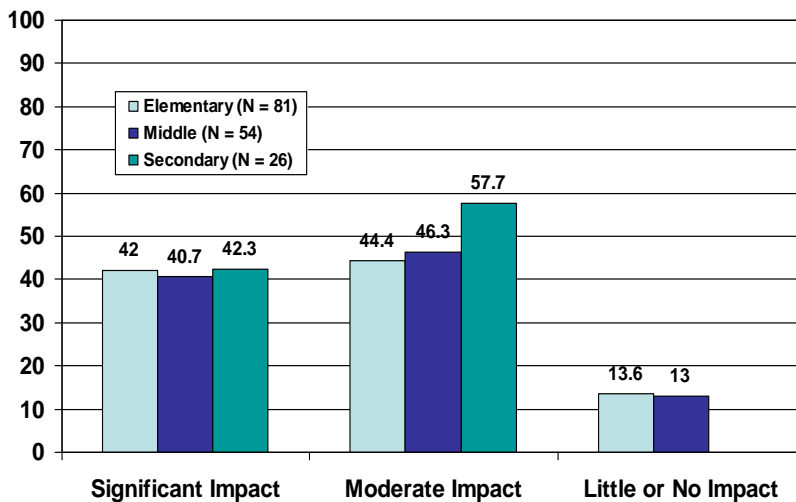


Figure 6. KCA'S perceived level of impact on the classroom teacher by building type



Participants 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. For this question, a significant impact was defined for teachers as having the encouragement of administrators to use technology in their instruction and that the school has purchased more computers for student use. Being moderately impacted was described as knowing the benefits of KCA, but it was up to the individual teacher to decide whether or not to use technology in his or her classroom. Finally, little or no impact meant that teachers were encouraged not to use technology in their classrooms and

computers were not available for student use. The distributions of these responses are provided in Figures 7 and 8.

Figure 7. KCA'S perceived level of impact on the building by content area taught

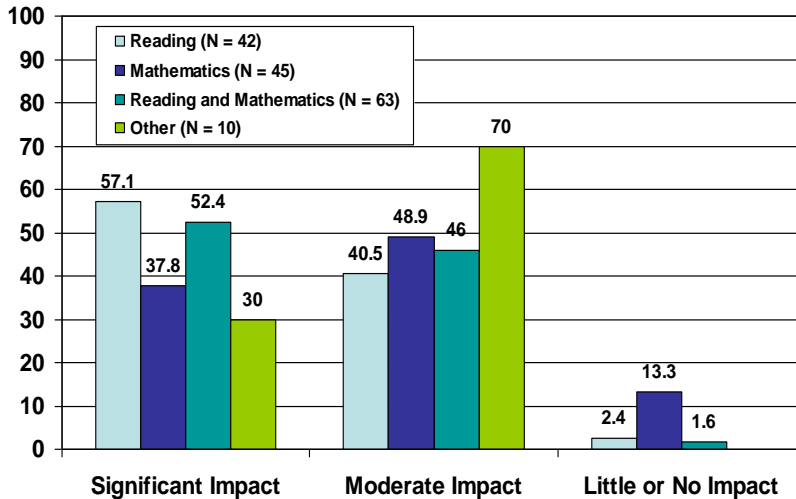
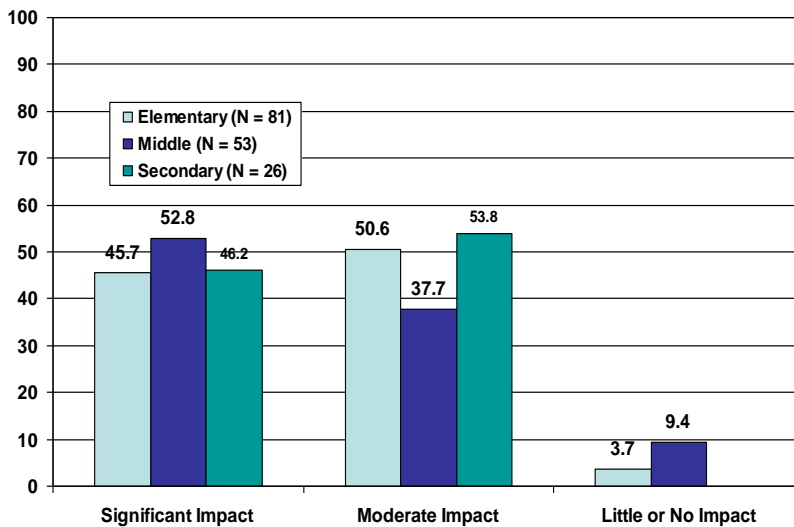


Figure 8. KCA'S perceived level of impact on the building by building type



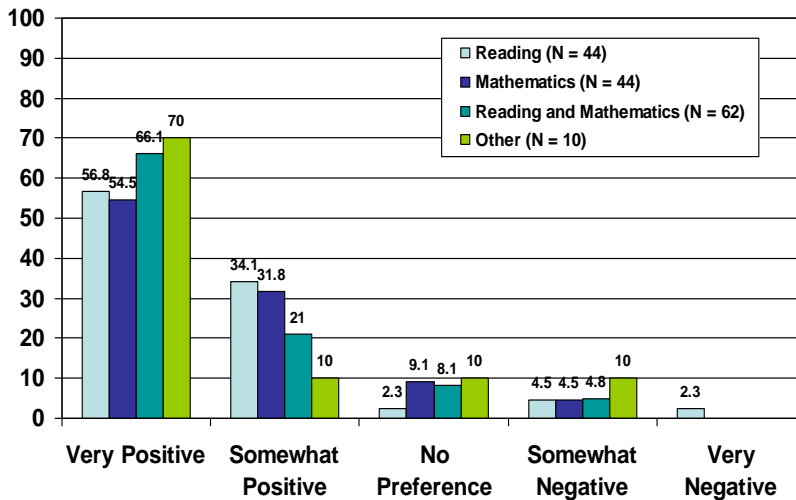
No relationship was found between level of impact and type of building, [$\chi^2(4, N = 160) = 5.48, p = .242$] with over 90 percent of respondents rating the level of impact KCA has had on their building as *moderate* or *significant*. However, for content area taught, an overall relationship was found with level of impact, [$\chi^2(6, N = 160) = 12.98, p = .043$]. Similar to the previous findings, over 95 percent of Reading, Combined Reading and Math, and those classified as Other noted that the level

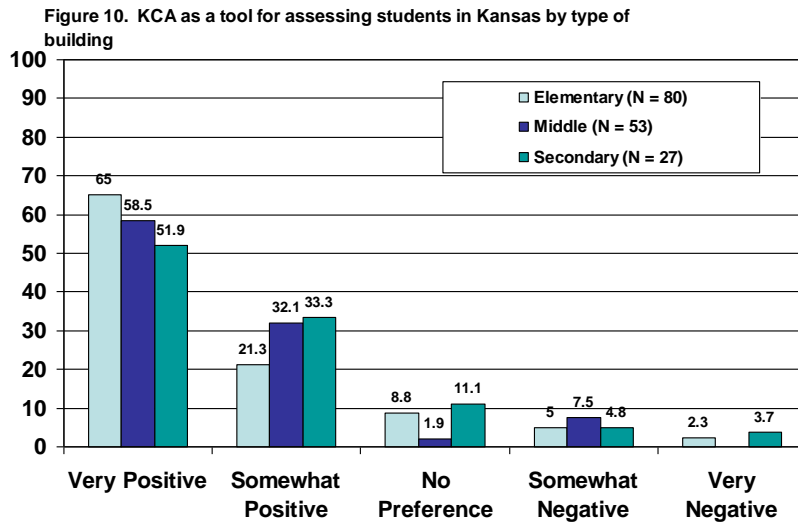
of impact on their building was moderate to significant. In contrast to this, almost 15 percent (13.3%) of Mathematics teachers felt that KCA had little to no impact on their instruction. Further investigation revealed that Mathematics teachers differed in their opinion regarding whether KCA had any impact on instruction from those teachers who taught both Reading and Mathematics [$\chi^2(2, N = 108) = 6.84, p = .033$], but not from those who taught only Reading or 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.

Perceived Quality of KCA

On a five point scale from *Very Positive* to *Very Negative*, participants were asked to rate the KCA system as a tool for assessing students in the state of Kansas. No significant differences were found in the pattern of responding by content area, [$\chi^2(12, N = 160) = 9.06, p = .698$] nor by building type, [$\chi^2(8, N = 160) = 12.53, p = .129$]. Over half of respondents (55% to 70%) found the KCA system to be *very positive* and agreed that testing via KCA has many advantages, makes assessment instructionally supportive, and had a preference for students to take their assessments via the computer (Figures 9 and 10). An additional 10 to 34 percent were *somewhat positive* in their opinion of KCA as a system tool. Approximately 10 percent indicated *no preference* to how their students were tested on state assessments, leaving the remaining 5 to 10 percent viewing the system as either *somewhat negative* or *very negative*. Those holding negative views felt that testing students using an online assessment system was not a proper method to measure their students’ learning. This pattern of responding was consistent regardless of building grade level.

Figure 9. KCA as a tool for assessing students in Kansas by content area taught





On a related note, teachers were also asked to provide their perception of the percentage of students that preferred to take the Kansas Assessments online. This pattern of response also did not differ by content area, [$\chi^2(9, N = 160) = 5.92, p = .748$] nor by building type, [$\chi^2(6, N = 160) = 2.97, p = .813$]. As shown in Figures 11 and 12 a majority of participants (approximately 70%) felt that *most* of their students preferred to take the assessments via the computer while approximately 10% believed that *all* of their students preferred this mode of test taking. The remaining teachers responded that their students did not necessarily have a preference for mode of testing with 10 to 20% indicating a *50-50 split* and less than 5% responding that *less than half* preferred online testing. This finding is consistent with past research conducted by Glasnapp, Poggio, Poggio, and Yang (2004). In their research with seventh grade students taking KCA, about half for the first time, it was found that overall students had a positive attitude towards taking tests in school online with few reporting having any difficulty or anxiety about this method of testing versus paper and pencil.

Figure 11. Teacher perception of percentage of students preferring to take the Kansas Assessments via the computer by content area taught

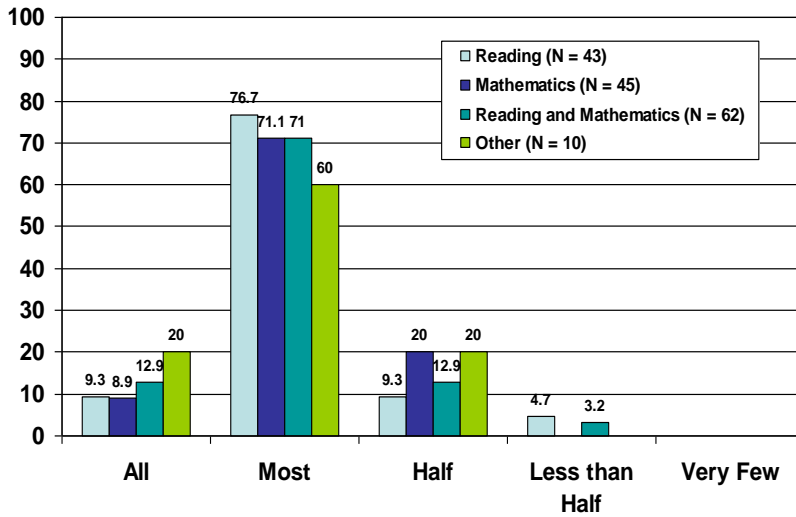
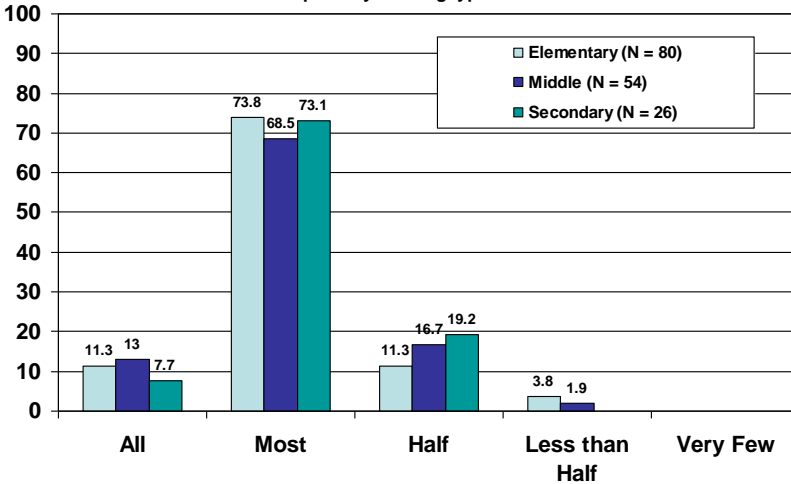


Figure 12. Teacher perception of percentage of students preferring to take the Kansas Assessments via the computer by building type

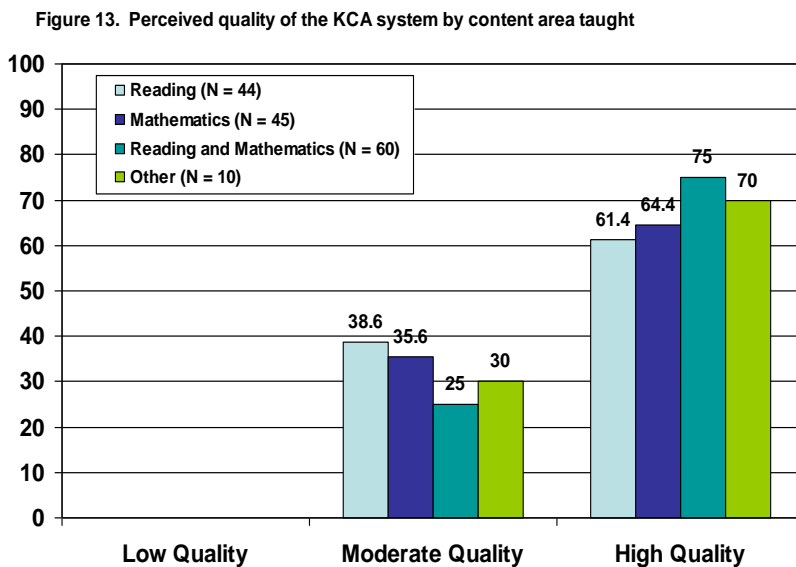


Finally, teachers were asked to judge the overall quality of the KCA system on a scale from Low to High. To make judgments regarding the quality of the KCA system, teachers were provided with the following descriptions: 1) *High quality* was characterized as KCA being easy to use and student-friendly. In addition, the tutorials and student tools were both viewed to be helpful to students. Score reports were perceived to be understandable and aid in the identification of student strengths and weaknesses and development of instructional material. 2) *Medium quality* was described as offering some advantages which were helpful to students and to teachers, but the system needed improvement.

3) Low quality was defined as the system did not offer any benefits to students or teachers and needed substantial improvement. Additionally, the system was perceived not to be useful.

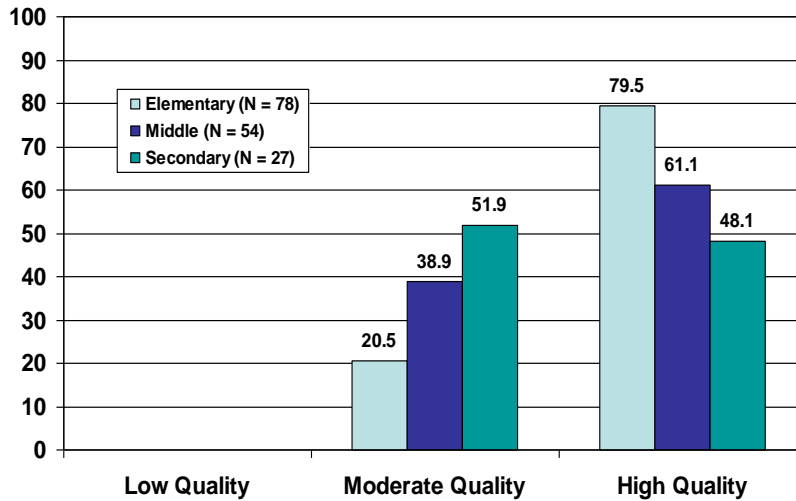
None of the participating teachers rated the KCA system as being of low quality. However, there were teachers whose opinion was that the online system could be improved as well as teachers who felt the system was of high quality. Interestingly, this pattern of response did not vary by content area taught [$\chi^2(3, N = 159) = 2.52, p = .472$], but did vary by building grade level [$\chi^2(2, N = 159) = 10.78, p = .005$].

The data revealed that approximately two-thirds of respondents (61% to 75%) judged the KCA system to be of *high quality* as provided in Figure 13. The remaining participants rated the online system as being of *medium quality*. Participants were also given the opportunity to comment openly on their perception of the quality of the online testing system. In general most participants did not make any comments but when they did the comments were focused on the technological aspects of maintaining and administering a statewide online system. Some comments centered on technology issues in the participant's building to technological difficulties from CETE. Other remarks focused on tools within the assessment design to assist students in completing the test (e.g., highlighter or calculator).



When the responses were aggregated by grade level of the building in which the participant taught (Figure 14), it was found that a larger percentage of elementary teachers reported the quality of KCA to be higher than those teaching at the middle or secondary levels [$\chi^2(1, N = 132) = 5.34, p = .021$; $\chi^2(1, N = 105) = 9.65, p = .002$], respectively. This pattern was not different for those teaching at the middle and secondary levels, [$\chi^2(1, N = 81) = 1.23, p = .267$].

Figure 14. Perceived quality of the KCA system by building type



Conclusion

With the increasing number of students within the United States taking high stakes assessments online over the last few years, it was important to evaluate the components and quality of the computer based assessment system developed for the state of Kansas from the perspective of those responsible for implementing and assisting students at the local level (i.e, the classroom teacher). It was of particular interest the impact that KCA had in the classroom, on instruction, assessment, and curricular planning. In general, results were as expected: 1) a majority of schools have chosen to test almost all of their students using the KCA system and this number has continued to increase since 2003; and 2) teachers report a positive opinion about the KCA system as a tool for assessing their students. What is lacking in the current data are the details necessary to evaluate what instructional changes, if any, are taking place due to the additional information instantly available to teachers regarding student strength and weaknesses. Teachers were provided with many opportunities on the questionnaire to comment openly on issues regarding their classroom and instruction and the relationship they both have to KCA. Unfortunately, very few teachers took advantage of this. Future studies evaluating the impact that online testing systems have on the practicing classroom teacher's instruction and ultimately on student outcomes would be valuable and informative to many stakeholders.