Technical Documentation for the AISD Student Climate Survey, Spring 2014

Department of Research and Evaluation
Austin Independent School District

Online Administration of the Student Climate Survey

The Department of Research and Evaluation (DRE) requested volunteer schools to pilot the Student Climate Survey online for the second year. In Spring 2014, 16 schools (14 elementary schools, one middle school, and one alternative high school) administered the Student Climate Survey online, resulting in 4,014 completed student responses. This was an improvement from Spring 2013, when only one elementary school administered the survey online, resulting in 291 responses.

Survey participants. Of the 5,140 students who were asked to participate in the online survey, 4,014 students (78%) completed the survey online. This response rate was comparable to the response rate for students who completed the survey on paper (77%). Students who took the survey online were asked to provide their student ID as a form of data verification, and 3,390 (84%) students provided the correct student ID. Characteristics of students who participated in the survey were similar across survey types (Table 1), although a greater proportion elementary students responded to the survey online than did so on paper (84% versus 37%, respectively; Table 1).

Table 1. Characteristics of Students Completing the Student Climate Survey, Spring 2014

	Paper (n = 36,731)	Online (n = 4,014)
Response rate	77%	78%
% of responses by school level		
Elementary schools	37%	84%
Middle schools	32%	15%
High schools	31%	2%
Campus % economic disadvantage	55%	69%
Survey language		
English	94%	96%
Spanish	6%	4%

Source. Spring 2014 Student Climate Survey data and 2014 PEIMS data
Note. Online survey language did not include students who switched between English and Spanish versions of the survey.

About this report. This report analyzes the psychometric properties of the AISD Student Climate Survey for each survey type. Campus reports and the district report are available on the DRE's website.

What are psychometrics? Most researchers use tests of reliability and validity to determine if a test or survey consistently measures the same constructs over time (reliability), and if that test or survey measures what it purports to measure (validity). Tests of reliability include Cronbach's alpha (α), which measures the consistency of answers within a given test or survey. Tests of validity include factor analysis, which determines which items on a test or survey correlate together around a common variable or subscale.

What properties were analyzed for the AISD Student Climate Survey?

- Factor analysis, by survey type and school level
- Reliability of survey subscales using Cronbach's alpha (α), by survey type
- Analysis of missing data, by survey type
- Analysis of student and school demographics, by survey type
- Analysis of students' favorable responses, by survey type

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Administration of the online Student Climate Survey. The online version of the Student Climate Survey was similar to the paper version with a few exceptions. First, students who used the online version were asked to enter their student ID as a means of data verification. Teachers were asked to provide students with their ID if students did not know it (only 16% of students' IDs were either blank or inaccurate). Second, an additional item, "Students at my school have chances to work with other students on projects," was only asked to students completing the survey online. Third, students could select the language (English and Spanish only) in which they felt comfortable completing the survey; however, many students switched back and forth between English and Spanish, which was not recorded by the survey software. The online survey asked questions in blocks of five items at the elementary school level and in blocks of 10 at the high school level to make the survey easier for students to follow. Finally, the survey administration setting was in a computer lab rather than a traditional classroom. To administer the survey online, campus contacts worked with their computer lab to schedule a time for each class to take the survey. At all but one school, campus contacts described the process of administering the survey online as "easy" and "straightforward," and reported "no problems" with online administration. One campus contact reported finding the process of retyping the survey address into the web browser for every student cumbersome. However, in reality, this process was unnecessary because the survey automatically restarted after each student completed the survey. After this was explained, the contact's opinion of the online administration improved. Indeed, most campus contacts looked forward to administering the survey online in subsequent years and preferred the online administration to the paper administration of the survey.

Analysis of Psychometric Properties

With ample online survey responses in Spring 2014, the following analyses were conducted to ensure the psychometric properties of the survey were stable across survey types: (a) comparisons of subscale factor structures across survey types; (b) comparisons of reliability estimates of subscales across survey types; (c) comparisons of the percentage of missing data (e.g., *Don't know* and blank responses) across survey types; and (d) comparisons of students' favorable responses (e.g., the percentage of students who responded *A lot of the time*, and *Sometimes*) across survey types.

Factor analysis. Each year since Spring 2004, a factor analysis has been conducted using all survey responses to determine if changes should be made to each subscale based on the factor structures. To determine if similar factor structures emerged for the online and paper versions of the survey in Spring 2014, separate factor analyses were conducted by survey type. Factor analyses are presented for the elementary school level only, due to the small number of online responses at the middle and high school levels. Both online and paper factor analyses yielded six unique factors, which closely resembled the five existing survey subscales: 1) behavioral environment, 2) adult fairness and respect, 3) student engagement, 4) academic self-confidence, and 5) teacher expectations (Table 2). The online survey did not produce a factor similar to adult fairness and respect; instead, these items loaded on either the student engagement or the teacher expectations subscale. The sixth factor produced in both analyses contained few items and did not have a strong theme. Rather than creating unique survey subscales for

Table 2. Rotated Factor Solution for All Items at the Elementary School Level Only, by Survey Version

	Paper						Online					
Survey item / Factor	1	2	3	4	5	6	1	2†	3	4	5	6
1. My classmates show respect to each other.	.72						.57					
2. My classmates show respect to other students who are different.	.63						.45	.41				
3. I am happy with the way my classmates treat me.	.57							.52				
4. Teachers at this school care about their students.		.49			.48				.45		.53	
5. Adults at this school listen to student ideas and opinions.		.51							.55			
6. Adults at this school treat all students fairly.		.69							.47			
7. The staff in the front office show respect to students.											.77	
8. There is at least one adult at my school who I would go to if I have a problem.						.43						.54
9. I like to come to school.			.70						.68			
10. The consequences for breaking the school rules are the same for everyone.		.57										
11. My teachers make sure the students follow the rules.					.42						.46	
12. My teachers believe I can learn.					.65						.71	
13. Students at my school follow the school rules.	.68						.67					
14. I feel safe at my school.	.40							.43				
15. Students at this school treat teachers with respect.	.64						.71					
16. I can do even the hardest schoolwork if I try.				.66						.61		
17. I enjoy doing my schoolwork.			.76							.40		
18. I am/was well prepared to take the TAKS/ STAAR.				.59						.57		
19. I try hard to do my best work.					.40					.42		
20. My teachers believe I can do well in school.					.64							
21. My teachers like to teach.					.42							
22. I feel successful in my schoolwork.				.61						.65		
23. I can reach the goals I set for myself.				.62						.58		
24. My homework helps me learn things I need to know.			.58						.64			
25. My schoolwork makes me think about things in new ways.			.53						.63			

Note. The factor solution was produced using principal components with varimax rotation. Loadings less than .40 were excluded because they were not considered strong factor loadings.
The factors listed in this table are as follows: 1) behavioral environment, 2) adult fairness and respect, 3) student engagement, 4) academic self-confidence, and 5) teacher expectations
† The attributes of this factor appeared to be different for the online version of the survey than for the paper version of the survey; item loadings for this factor should not be compared across survey types.

Table 2. Rotated Factor Solution for All Items at the Elementary School Level Only, by Survey Version, Continued

	Paper						Online					
Survey item — Factor	1	2	3	4	5	6	1	2†	3	4	5	6
26. I have fun learning in my classes.			.69						.63			
27. My teachers are fair to everyone.				.58					.52			
28. My teachers connect what I am doing to my life outside the classroom.						.48			.58			
29. My classmates behave the way my teachers want them to.	.66											
30. Our classes stay busy and do not waste time.	.52											
31. Students at my school are bullied (teased, taunted, threatened by other students).*	.48									.69		
32. When bullying is reported to adults at my school they try to stop it.				.40						.41		
33. My teachers expect me to think hard about the things we read.		.57						.56				
34. My teachers expect everybody to work hard.		.67						.60				
35. My teachers expect my best effort.		.68						.63				
36. Teachers at this school know who I am.						.44						.50
37. I receive recognition or praise for doing good work.						.49			.49			.49
38. My teachers know what I am good at.						.42						

Note. The factor solution was produced using principal components with varimax rotation. Loadings less than .40 were excluded because they were not considered strong factor loadings.
The factors listed in this table are as follows: 1) behavioral environment, 2) adult fairness and respect, 3) student engagement, 4) academic self-confidence, and 5) teacher expectations
† The attributes of this factor appeared to be different for the online version of the survey than for the paper version of the survey; item loadings for this factor should not be compared across survey types.
* This item was reverse-scored so that higher responses were positive (i.e., higher responses indicated a lower incidence of bullying).

each survey type, reliability analyses were conducted across survey types and school levels to ensure that the existing five subscales remained reliable for each survey type.

Reliability. Cronbach's alpha (α) was computed for each subscale and for each survey type and school level to determine if reliability estimates for each of the five subscales (i.e., behavioral environment, adult fairness and respect, student engagement, academic self-confidence, and teacher expectations) remained stable across survey types and school levels. Results from these analyses suggest that the reliability of the subscales was comparable across survey types within a level (Table 3). Reliability estimates for each subscale ranged from $\alpha = .70$ to $\alpha = .91$ for the paper version of the survey and from $\alpha = .70$ to $\alpha = .89$ for the online version of the survey. Regardless of survey type, reliability estimates were slightly lower at the elementary school level than at the middle and high school levels, but were still considered moderate to strong. Despite the different survey format and the slightly

different factor structures emerging from the factor analyses, students' responses continued to reliably measure each subscale, regardless of survey type or school level.

Table 3. Reliability Coefficients (α) of Subscales, by Survey Type and School Level, Spring 2014

Subscale	Elementary school		Middle school		High school	
	Paper	Online	Paper	Online	Paper	Online
Behavioral environment	.77	.79	.81	.80	.80	.71
Adult fairness and respect	.78	.78	.89	.88	.91	.89
Student engagement	.81	.83	.85	.84	.86	.89
Academic self-confidence	.70	.70	.81	.80	.81	.83
Teacher expectations	.71	.73	.88	.85	.87	.81

Note. Reliability estimates can range from .00 to 1.0, with estimates above .60 considered acceptable.

Invalid responses. Analyses were conducted to determine if students were more likely to answer *Don't know* or to leave answers blank in the online version of the survey than on the paper version of the survey (Table 4). Historically, missing and *Don't know* responses were considered invalid for purposes of subscale scoring and were excluded from data analyses. Students who took the survey online left slightly more items blank, but were less likely to respond *Don't know* and generally had fewer invalid responses, compared with students who took the survey on paper.

Table 4. Percentage of *Don't Know*, Blank, and Total Invalid Responses by Item and Survey Type, Spring 2014

Survey item Response	Paper			Online		
	Don't know	Blank	Total invalid	Don't know	Blank	Total invalid
1. My classmates show respect to each other.	4.2%	0.4%	4.6%*	3.2%	0.5%	3.7%
2. My classmates show respect to other students who are different.	7.2%	0.4%	7.6%*	5.6%	1.2%	6.8%
3. I am happy with the way my classmates treat me.	3.5%	0.7%	4.2%*	2.1%	1.3%	3.4%
4. Teachers at this school care about their students.	5.1%	0.7%	5.8%*	1.9%	1.8%	3.7%
5. Adults at this school listen to student ideas and opinions.	7.2%	0.8%	8.0%	5.8%	1.7%	7.5%
6. Adults at this school treat all students fairly.	6.2%	0.8%	7.0%*	4.0%	2.0%	6.1%
7. The staff in the front office show respect to students.	9.1%	1.1%	10.2%*	4.9%	2.3%	7.1%
8. There is at least one adult at my school who I would go to if I have a problem.	8.7%	1.1%	9.9%*	5.1%	2.3%	7.4%
9. I like to come to school.	2.8%	1.0%	3.8%	1.6%	2.4%	4.1%
10. The consequences for breaking the school rules are the same for everyone.	9.5%	1.0%	10.5%	7.6%	3.0%	10.5%
11. My teachers make sure the students follow the rules.	3.7%	0.9%	4.6%*	0.9%	1.9%	2.9%
12. My teachers believe I can learn.	6.1%	1.0%	7.1%*	2.2%	2.3%	4.5%
13. Students at my school follow the school rules.	5.5%	1.2%	6.8%*	3.2%	2.4%	5.6%

* Indicates a significant difference between paper and online ($p < .05$) using the *z*-test for proportions.

Table 4. Percentage of *Don't Know*, Blank, and Total Missing Responses by Item and Survey Type, Spring 2014, Continued

Survey item / Response	Paper			Online		
	Don't know	Blank	Total invalid	Don't know	Blank	Total invalid
14. I feel safe at my school.	4.3%	1.1%	5.5%*	1.8%	2.4%	4.2%
15. Students at this school treat teachers with respect.	5.1%	1.1%	6.3%	3.2%	2.9%	6.1%
16. I can do even the hardest schoolwork if I try.	5.1%	1.2%	6.2%*	2%	2.3%	4.4%
17. I enjoy doing my schoolwork.	2.7%	1.3%	4.0%	1.3%	2.5%	3.8%
18. I am/was well prepared to take the TAKS/STAAR.	9.5%	1.2%	10.8%*	6.2%	2.9%	9.1%
19. I try hard to do my best work.	2.3%	1.3%	3.7%	0.7%	2.8%	3.5%
20. My teachers believe I can do well in school.	7.2%	1.1%	8.3%*	3.2%	3.5%	6.7%
21. My teachers like to teach.	12.9%	1.2%	14.1%*	8.4%	2.5%	11%
22. I feel successful in my schoolwork.	3.9%	1.3%	5.2%*	1.2%	2.9%	4.1%
23. I can reach the goals I set for myself.	4.9%	1.4%	6.2%*	1.8%	3.0%	4.8%
24. My homework helps me learn things I need to know.	3.9%	1.3%	5.2%	2.3%	2.7%	5.0%
25. My schoolwork makes me think about things in new ways.	5.6%	1.5%	7.1%	3.5%	3.8%	7.2%
26. I have fun learning in my classes.	3.0%	1.4%	4.4%*	1.0%	3.0%	4.1%
27. My teachers are fair to everyone.	6.5%	1.6%	8.1%*	3.0%	3.1%	6.1%
28. My teachers connect what I am doing to my life outside the classroom.	14.0%	1.7%	15.8%	12.4%	3.3%	15.6%
29. My classmates behave the way my teachers want them to.	5.5%	1.7%	7.2%*	2.8%	3.2%	6.0%
30. Our classes stay busy and do not waste time.	4.9%	1.7%	6.6%	2.5%	4.3%	6.8%
31. Students at my school are bullied (teased, taunted, threatened by other students).	19.0%	1.6%	20.6%*	16.0%	2.9%	19.0%
32. When bullying is reported to adults at my school they try to stop it.	16.8%	1.6%	18.3%*	10.0%	3.3%	13.2%
33. My teachers expect me to think hard about the things we read.	6.9%	1.5%	8.4%*	3.8%	3.5%	7.3%
34. My teachers expect everybody to work hard.	4.5%	1.3%	5.8%*	1.4%	3.5%	4.9%
35. My teachers expect my best effort.	4.8%	1.4%	6.2%	1.9%	4.2%	6.2%
36. Teachers at this school know who I am.	8.7%	1.6%	10.3%*	4.4%	2.7%	7.1%
37. I receive recognition or praise for doing good work.	7.3%	1.7%	9.0%	5.2%	3.2%	8.3%
38. My teachers know what I am good at.	12.2%	3.0%	15.2%*	6.4%	3.3%	9.7%

* Indicates a significant difference between paper and online ($p < .05$) using the *z*-test for proportions.

These findings corroborate existing research (Denscombe, 2006 & 2009) comparing item non-response rates (i.e., analysis of missing data) on paper and online versions of the same survey. It should be noted that for both survey types and for most items, the total percentage of missing responses was less than 10%, with the percentage of blank responses similar to that reported by Denscombe (2009).

Students' responses. Finally, analyses were conducted to determine if the percentage of students who responded *A lot of the time* and *Sometimes* to each item differed according to survey type (Table 5). Due to the large proportion of online survey responses that were at the elementary school level, and because students at the elementary school level responded more favorably to the survey than did students in middle or high school levels, comparisons were conducted at the elementary school level only.

Table 5. Percentages of *A Lot of the Time*, and *Sometimes* Responses by Item and Survey Type, Spring 2014

Survey item	Paper	Online
1. My classmates show respect to each other.	87%	83%*
2. My classmates show respect to other students who are different.	84%	89%*
3. I am happy with the way my classmates treat me.	85%	90%*
4. Teachers at this school care about their students.	98%	98%
5. Adults at this school listen to student ideas and opinions.	92%	94%
6. Adults at this school treat all students fairly.	93%	96%*
7. The staff in the front office show respect to students.	97%	98%
8. There is at least one adult at my school who I would go to if I have a problem.	87%	90%*
9. I like to come to school.	82%	86%*
10. The consequences for breaking the school rules are the same for everyone.	90%	89%
11. My teachers make sure the students follow the rules.	98%	99%
12. My teachers believe I can learn.	98%	99%
13. Students at my school follow the school rules.	80%	86%*
14. I feel safe at my school.	90%	94%*
15. Students at this school treat teachers with respect.	89%	92%*
16. I can do even the hardest schoolwork if I try.	92%	95%*
17. I enjoy doing my schoolwork.	81%	82%
18. I am/was well prepared to take the TAKS/STAAR.	90%	93%*
19. I try hard to do my best work.	97%	99%
20. My teachers believe I can do well in school.	98%	99%
21. My teachers like to teach.	98%	99%
22. I feel successful in my schoolwork.	92%	95%*
23. I can reach the goals I set for myself.	92%	95%*
24. My homework helps me learn things I need to know.	88%	88%
25. My schoolwork makes me think about things in new ways.	85%	87%*

Note. Percentages were only included for elementary school students.
* Percentages were significantly different ($p < .05$) using the *z*-test for proportions.

Table 5. Percentage of *A Lot of the Time*, and *Sometimes* Responses by Item and Survey Type, Spring 2014, Continued

Survey item	Paper	Online
26. I have fun learning in my classes.	87%	91%*
27. My teachers are fair to everyone.	94%	95%
28. My teachers connect what I am doing to my life outside the classroom.	82%	82%
29. My classmates behave the way my teachers want them to.	75%	81%*
30. Our classes stay busy and do not waste time.	82%	86%*
31. Students at my school are bullied (teased, taunted, threatened by other students).†	52%*	39%
32. When bullying is reported to adults at my school they try to stop it.	93%	95%
33. My teachers push me to think hard about the things we read.	98%	98%
34. My teachers push everybody to work hard.	99%	99%
35. My teachers expect my best effort.	98%	99%
36. Teachers at this school know who I am.	91%	94%*
37. I receive recognition or praise for doing good work.	88%	89%
38. My teachers know what I am good at.	94%	96%

Note. Percentages were only included for elementary school students.
† This item was reverse-scored to compute subscale and item level averages in the remainder of this and campus reports, but was not reverse-scored in this table. Higher scores indicate a greater incidence of bullying.
* Percentages were significantly different ($p < .05$) using the z-test for proportions.

Results suggest that students' responses to the items were generally more favorable online than on paper (Table 5).

This tendency was consistent with the research conducted by Carini, Hayek, Kuh, Kennedy, and Ouimet (2003), which found that college students' online responses tended to be more favorable than college students' paper responses. Carini and colleagues argued that this discrepancy could be attributed to the fact that students are typically more engaged in online formats than in paper formats and enjoy the online environment better than the paper format when participating in surveys. The authors suggest that differences in students' perceptions could positively influence their online responses. However, the self-selection of schools participating in the online survey pilot may have confounded the results of the paper versus online comparison.

To determine if the differences found between elementary school students' online responses and paper responses were the result of survey type or the result of inherent differences between the schools that volunteered to administer the survey online and those schools that did not, elementary school students' responses to the Spring 2013 survey (i.e., the previous year) were analyzed and were compared based on the schools' Spring 2014 survey type (e.g., online or paper). Results from these analyses found that the schools electing to administer the survey online in Spring 2014 had more favorable responses to survey items in Spring 2013 than did schools electing to administer the survey on paper in Spring 2014. Given the already-existing difference in survey responses based on Spring 2014 survey type, it is likely that differences between these groups were more based on inherent variances in campus climate

between campuses that chose to pilot the online version of the survey and campuses that did not volunteer for the online survey pilot.

LIMITATIONS AND CONCLUSION.

Limitations. Although most campus contacts reported positive experiences with the online administration process, campuses that elected to pilot the survey in an online format were mostly elementary schools, which are smaller than middle or high schools and easily scheduled times for students to take the survey in the computer lab. Indeed, some middle and high schools that were initially interested in administering the survey online eventually chose to administer the survey on paper because of the perceived difficulty in coordinating computer lab time for all their students to complete the survey. Additional limitations with the online administration of the survey were related to students' responses to items requesting school name, survey language, and student ID. For example, some students selected the wrong school, some students did not know their student ID (although 84% of students accurately entered these data), and the survey language was not recorded for students who switched between the English and Spanish versions of the survey. DRE staff will continue to address these issues to ensure that these data are accurately captured in both the online and paper versions of the survey.

Conclusion. Despite the somewhat dissimilar factor structures that emerged from the factor analysis, the reliability of each subscale remained consistent across survey types. Additionally, although the percentage of missing data was slightly higher for the paper version of the survey than for the online version of the survey, for most items the percentage of missing responses was low. Although ratings differed for online and paper responses, the evidence suggests differences were due to the self-selected sample of schools rather than the survey type. Finally, as the district continues to promote the administration of the AISD Student Climate Survey online, efforts should be made to ensure that all schools have the proper infrastructure in place (e.g., an adequate number of computers, and sufficient lab time) to effectively administer the surveys online. Additionally, DRE staff should continue to monitor students' responses to both the online and paper versions of the survey to ensure that they continue to hold similar psychometric properties.

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