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An Analysis of Students' Reliable Integrated Trend Scores (RITS) in the Electronic Child Study Team (eCST) Database

The purpose of this report is to analyze the stability of students' reliable integrated trend scores (RITS) over time and to determine which elementary school factors predict RITS at the secondary level.

What is RITS?

Beginning in Spring 2011, Austin Independent School District (AISD) developed an early warning drop out indicator to keep track of high school students' academic, behavioral, and attendance progress. By 2014–2015, district administrators decided to make this early warning indicator, now called RITS, available in the district's electronic Child Study Team's (eCST) database for all middle and high school students. The purpose of RITS expanded from an early warning drop out indicator to a universal screener for students at the middle and high school levels. Staff are now taught to use RITS as a method for digging deeper into a student's data to determine why his or her RITS has changed (e.g., due to factors at home or at school), if the student has experienced trauma, and if the student is in need of an immediate intervention. AISD child study systems (CSS) staff are currently in the process of gathering feedback from principals to determine which factors should be included in elementary school students' RITS. Research in this report will help inform those discussions.

How is RITS computed and used by AISD staff?

The following components are used to compute middle and high school students' RITS: failing grades (multiplied by 3), unexcused tardies (multiplied by .5), unexcused absences (multiplied by 1), and office discipline referrals or suspensions (multiplied by 1). Scores are summed such that higher RITS call for AISD staff to dig deeper and determine why a student is struggling in areas related to grades, attendance, and behavior. Conversely, a low RITS indicates a student is succeeding in multiple areas, calling for a review of programs contributing to this students' success. RITS is computed every 3 weeks as well as every 6 weeks for progress reports, and for official report cards. This allows AISD staff the ability to monitor changes in RITS so they can celebrate successes or intervene if necessary. AISD counselors can use RITS to look for a spike in their students' RITS throughout the school year to determine if and when interventions are necessary. Other staff, such as athletic coaches and advisory teachers, create rosters with their students' RITS to determine which students need help returning homework, catching up in a class, or possibly experiencing trauma. AISD multi-tiered system of support (MTSS) staff provide training to AISD staff on the use of RITS to best help their students. Contact the CSS department for a more detailed description of RITS.

❓ What data were included in this report?

Data from 32,809 students enrolled in 6th through 12th grade in 2015–2016 with RITS scores[1] (and RITS components) were matched with their 2014–2015 RITS and RITS components (Appendix A lists the number of students with matched data for each grade). This allowed for the examination of RITS over time, and the ability to determine which RITS components for students in 5th grade in 2014–2015 predicted their 6th-grade RITS. Additionally, students' 2013–2014 personal development skill report card ratings were matched to students' 2015–2016 RITS and RITS components.

🕐 Was RITS stable over time?

Although some district staff are trained to use RITS to identify students requiring intervention services, the stability of RITS composite and components over time have not been analyzed. To do so, correlations between composite RITS and RITS components were conducted using data from 2014–2015 and 2015–2016, separately for each grade (Table 1). At each grade level, composite RITS were moderately to strongly related from 2014–2015 to 2015–2016 (r values ranged from .56 to .60). Additionally, unexcused absences were moderately to strongly related over time for most grades, and strongly to very strongly related over time for grades 7 and 8. Similarly, unexcused tardies were weakly to moderately related over time for students in 6th grade in 2015–2016, and moderately to strongly related over time for the remaining grades. Based on these correlations, unexcused absences, unexcused tardies, and home school suspensions could be used in computing elementary school students' RITS.

Table 1.
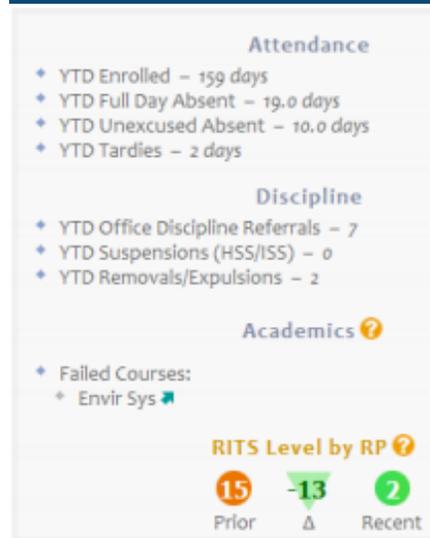**RITS was moderately to strongly related over time for all available grades.**

2015–2016 grade	RITS	UA	UT	ODR	CFG	ISS	HSS
6	—	◗	○				○
7	◗	●	◗	○	○	◗	◗
8	◗	●	◗	○	◗	◗	◗
9	◗	◗	◗	○	◗	○	◗
10	◗	◗	◗		◗	○	○
11	◗	◗	◗		◗	○	○
12	◗	◗	◗		○		○

Source. 2014–2015 and 2015–2016 AISD RITS and RITS component data from eCST
Note. UA = # of unexcused absences (year-end total); UT = # of unexcused tardies (year-end total); ODR = # of office disciplinary referrals (6th reporting period); CFG = # of core failing grades (i.e., the number of failing grades in math, reading, or science at 6th reporting period; the number of all failing grades was not available); ISS = year-end total number of in school suspensions; HSS = year-end total number of home school suspensions.
Correlations are presented such that 2014–2015 RITS and components are correlated with the same component in 2015–2016.
○ significant weak-to-moderate positive relationship (r values between .20 and .40); ◗ significant moderate-to-strong positive relationship (r values between .40 and .60); ● significant strong-to-very strong positive correlation (r values above .60).
— comparisons not available.

[1] Because RITS is available for middle and high school students only, students enrolled in 6th grade in 2015–2016 were included when they had RITS components (not the composite RITS) for 2014–2015 and 2015–2016.

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Next, a coefficient of variation (CV) was computed for RITS composite and components in 2014–2015 and 2015–2016. CVs greater than 1.0 are considered unstable. CVs for RITS were more stable (i.e., close to 1) in 10th through 12th grade at both time points. On the other hand, CVs for RITS and RITS components were less stable (i.e., greater than 1.0) at both time points for 6th though 8thgrade (Table 2). Regardless of grade, CVs were less stable for the number of office disciplinary referrals, core failing grades, in school suspensions, and home school suspensions. Because most RITS components were extremely volatile, caution should be used if these components are included in elementary school RITS computations.

Table 2.
RITS was stable at both time points, with scores more stable in grades 10 through 12 than in younger grades.

2015–2016 grade	2014–2015							2015–2016						
	RITS	UA	UT	ODR	CFG	ISS	HSS	RITS	UA	UT	ODR	CFG	ISS	HSS
6	—	2	2	—	—	—	—	—	—	2	—	—	—	—
7	2	2	2	4	3	4	6	2	2	2	4	3	4	5
8	2	2	2	4	3	4	5	2	2	2	4	3	4	4
9	2	2	2	4	2	3	4	1	2	2	4	2	6	5
10	1	2	2	4	2	6	5	1	2	1	4	2	7	5
11	1	1	2	5	2	6	5	1	1	1	6	2	7	5
12	1	1	2	6	2	9	7	1	1	1	9	2	11	6

Source. 2014–2015 and 2015–2016 AISD RITS and RITS component data from eCST
Note. UA = # of unexcused absences (year-end total); UT = # of unexcused tardies (year-end total); ODR = # of office disciplinary referrals (6th reporting period); CFG = # of core failing grades (i.e., the number of failing grades in math, reading, or science at 6th reporting period; the number of all failing grades was not available); ISS = year-end total number of in school suspensions; HSS = year-end total number of home school suspensions. — indicates too few cases to compute a CV.

Finally, stepwise regressions were conducted to determine if 2014–2015 RITS components predicted 2015–2016 RITS. After controlling for 2014–2015 RITS composite scores, 2014–2015 unexcused absences and unexcused tardies significantly predicted 2015–2016 RITS in grades 6 through 12 (see Appendix B). The number of home school suspensions in 2014–2015 was the least predictive of 2015–2016 RITS for each grade examined. R^2 values were also examined to determine the practical significance of the models. The R^2 was lowest at 6th grade, with RITS components only explaining 16% (i.e., $R^2 = .16$) of the variance in predicting students' 2015–2016 RITS. For grades 7 through 11, at least 40% of the variance in predicting students' 2015–2016 RITS (i.e., $R^2 = .40$ and above; Appendix B) was accounted for by 2014–2015 RITS components. Given the desire to develop RITS for elementary school students, and because only two of the current RITS components seem reasonable to use at the elementary school level, it is critical to explore additional factors to include in the RITS computation at the elementary school level.

Did teachers' ratings of their elementary school students' personal development skills predict students' middle school RITS?

As described in a previous report (Lamb, 2017), students' personal development skills are stable over time and are positively related to student performance on the State of Texas Assessment for Academic Readiness (STAAR). Similar to other RITS components, these ratings are available every 9 weeks and could be included in the eCST. For these reasons, analyses were conducted to determine if elementary school students' personal development skill report card ratings predicted their middle school RITS. Specifically, teachers' 2013–2014 ratings of their students' personal development skills were matched to their 2015–2016 RITS. Teachers' high positive ratings of their students' personal development skills were significantly correlated to students' low (positive) 2015–2016 RITS (Appendix C).

Due to the positive relationship between high personal development skill ratings and low RITS, students' personal development skill ratings were used to predict their 2015–2016 RITS. Stepwise regressions were conducted separately based on 2015-2016 grade level. Regardless of grade, higher 2013–2014 personal development skill ratings of being responsible for completing and returning homework and of respecting self and others significantly predicted low RITS in 2015–2016 (Appendix D). Additionally, for students enrolled in 7th grade in 2015–2016, 2013–2014 personal development skill ratings of effective decision making also predicted low RITS. In terms of practical significance of the models, R^2 values associated with each model were low, ranging from accounting for 15% to 16% of the variance in predicting RITS composite scores (Appendix D).

Because the personal development skill ratings on their own accounted for a small percentage of variability in students' RITS, stepwise regressions were conducted including 2014–2015 RITS components and students' personal development skill ratings. For students enrolled in 7th grade in 2015–2016, after controlling for 2014–2015 RITS and RITS components, teachers' ratings of the degree to which their students were responsible for completing and returning homework and respected themselves and others significantly predicted low RITS in 2015–2016. Additionally, the R^2 value increased from 16% to 60% of the variance in predicting 2015–2016 RITS (Appendix E). For students enrolled in 8th grade in 2015–2016, after controlling for 2014–2015 RITS and including 2014–2015 RITS components in the model, students' 2013–2014 personal development skill ratings no longer predicted 2015–2016 RITS (Appendix E). Finally, for students enrolled in 6th grade in 2015–2016, after including 2014–2015 RITS components in the model, teachers' ratings of the degree to which their students completed and returned homework and respected themselves and others predicted low RITS in 2015–2016. Additionally, the amount of variance explained from including students' personal development skill ratings increased from 15% to 25% (Appendix E).

Conclusion

Based on the analyses explored in this report, it appears that composite RITS are fairly stable measures over time, across grade levels. However, it should be noted that some components of RITS are more stable over time than others, particularly in lower grades. For example, students' unexcused absences and unexcused tardies seem to serve as best predictors of subsequent year's RITS. Interestingly, prior research has found that 8th-grade attendance serves as a strong predictor of dropping out in high school (Brunner & Malerba, 2010). It also appears that including students' personal development skill ratings for completing and returning homework and respecting self and others were strong predictors of RITS. Finally, based on analyses in this report, elementary school students' ODRs, HSS, and ISS are less stable and occur less frequently in younger grades and should be excluded from elementary school level RITS computations. As a next step, data from this report will be shared with the MTSS team to help determine which factors should be included when computing RITS for elementary school students. Using personal development skills also allows for the inclusion of positive factors contributing to a students' persistence in school. Finally, after potential elementary school RITS factors have been identified, focus groups should be conducted with elementary school principals to ensure an accurate reflection of students' experiences.

Appendix A. Number of Students With 2014–2015 RITS (and RITS Components) Matched to 2015–2016 RITS (and RITS Components), by 2015–2016 Grade

2015–2016 grade	Number of students
6*	5,179
7	4,781
8	4,931
9	4,838
10	4,751
11	4,085
12	4,244

Source. 2014–2015 and 2015–2016 AISD RITS data from eCST
Note. Students are included when they have RITS scores for both years.
* 6th-grade students are included when they have RITS components for both years.

Appendix B. Parameter Estimates and Variance Explained for Each Regression Model Predicting 2015–2016 RITS Composite Score, by 2015–2016 Grade

2015–2016 grade	2014–2015 RITS and RITS components							
	RITS	UA	UT	ODR	CFG	ISS	HSS	R^2
6 (n = 4,720)	—	.37**	.09**	—	—	—	—	.16
7 (n = 4,781)	.46**	.19**	.10**	.32*	.22	.20**	.08	.41
8 (n = 4,931)	.32**	.18**	.05**	.51**	.67**	.36**	.06	.77
9 (n = 4,836)	.41**	.24**	.10**	.12	.50*	.73**	.12*	.38
10 (n = 4,748)	.48**	.27**	.09**	.07	.47*	.35*	.35*	.42
11 (n = 4,082)	.55**	.26**	.09**	.17	.21	-.13	.04	.42
12 (n = 4,232)	.24**	.12**	.07**	.78**	.51**	-.63**	.11	.32

Source. 2014–2015 and 2015–2016 AISD RITS and RITS component data from eCST
Note. UA = # of unexcused absences (year-end total); UT = # of unexcused tardies (year-end total); ODR = # of office disciplinary referrals (6th reporting period); CFG = # of core failing grades (i.e., the number of failing grades in math, reading, or science at 6th reporting period; the number of all failing grades was not available); ISS = year-end total number of in school suspensions; HSS = year-end total number of home school suspensions.
 * significant at $p < .05$
** significant at $p < .01$
— too few cases to include

Appendix C. Correlations Between Students' 2013–2014 Personal Development Skill Report Card Ratings and 2015–2016 RITS, by 2015–2016 Grade

2013–2014 personal development skill report card ratings	2015–2016 RITS		
	6th grade (*n* = 4,472)	7th grade (*n* = 4,648)	8th grade (*n* = 182)
Follows directions in all areas of school.	○	○	○
Makes effective decisions at school.	○	○	○
Is responsible for schoolwork.	○	○	○
Is responsible for completing and returning homework.	○	○	○
Demonstrates ability to set and achieve goals.	○	○	○
Takes responsibility for own actions.	○	○	○
Respects self and others.	○	○	○
Manages emotions constructively.	○	○	○
Interacts cooperatively with adults.	○	○	○
Interacts cooperatively with peers.	○	○	○

Source. 2013–2014 personal development skill ratings and 2015–2016 AISD RITS data from eCST
Note. Teachers rate students every 9 weeks, for a total of four ratings throughout the year on each domain, using a scale of 1 = *rarely* to 4 = *consistently*.
○ significant weak-to-moderate positive relationship (*r* values between -.20 and -.40; negative relationships indicate that a student had high personal development skill ratings and low RITS, low RITS are desired).
For the purposes of this analyses, ratings were averaged across all four time periods. For more information, on students' personal development skill report card ratings, please read Lamb, 2017.

Appendix D. Final Regression Models Using Students' 2013–2014 Personal Development Skill Report Card Ratings to Predict 2015–2016 RITS, by 2015–2016 Grade

2013–2014 personal development skill report card rating	2015–2016 grade		
	6 (*n* = 4,471) R^2 = .16	7 (*n* = 4,648) R^2 = .16	8 (*n* = 182) R^2 = .15
Responsible for completing and returning homework	-1.8**	-1.9**	-1.74*
Respects self and others	-1.5**	-.69**	-2.22*
Makes effective decisions	—	-1.44**	—

Source. 2013–2014 personal development skill ratings and 2015–2016 AISD RITS data from eCST
Note. Report card ratings that were significant predictors are included in the table. Teachers rate students every 9 weeks, for a total of four ratings throughout the year on each domain, using a scale of 1 = *rarely* to 4 = *consistently*.
For the purposes of this analyses, ratings were averaged across all four time periods. For more information, on students' personal development skill report card ratings, please read Lamb, 2017.
* significant at *p* < .05
** significant at *p* < .01
— not significant predictor in the model

Appendix E. Final Regression Models Using Students' 2013–2014 Personal Development Skill Report Card Ratings and 2014–2015 RITS Components to Predict 2015–2016 RITS, By 2015–2016 Grade

Predictors	2015–2016 grade		
	6 (n = 4,420) R^2 = .25	7 (n = 4,376) R^2 = .43	8 (n = 179) R^2 = .60
2014–2015 RITS	—	.42**	-.53*
2014–2015 unexcused absences (year end total)	.31**	.16**	.31**
2014–2015 unexcused tardies (year end total)	.07**	.10**	.22**
2014–2015 # days ISS (year end total)	—	—	.42
2014–2015 # days HSS (year end total)	—	—	—
2014–2015 ODRs (6th reporting period)	—	.46**	2.4**
2014–2015 # of core failing grades (6th reporting period)	—	.22	3.2**
Responsible for completing and returning homework	-1.2**	-.53**	-.23
Respects self and others	-1.4**	-.69**	-.52
Makes effective decisions	—	—	—

Source. 2013–2014 personal development skill ratings and 2015–2016 AISD RITS data from eCST.
Note. Report card ratings and RITS components that were significant predictors are included in the table.
Teachers rate students every 9 weeks, for a total of four ratings throughout the year on each domain, using a scale of 1 = *rarely* to 4 = *consistently*. For the purposes of this analyses, ratings were averaged across all four time periods. For more information, on students' personal development skill report card ratings, please read Lamb, 2017.
* significant at p < .05
** significant at p < .01
— not significant predictor in the model

References

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