**Summary Report**

**Changes in Scores on Delaware School Climate Scale-Students,**

**2012-2017**

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This report is the third annual report in a six-year longitudinal study of School Climate in Delaware. The analyses and results described in this report document how school climate, as reported through school climate scores derived from responses on student surveys, has changed in recent years in response to efforts to promote positive behavioral supports and improved overall climate in Delaware schools.

The descriptive statistics of school climate total scale and subscale scores show that the changes of school climate were quite favorable from 2012 to 2017. The results from longitudinal descriptive analyses are presented in Table 1 (see page 3). To further understand the trajectories of school climate, linear growth models were used to investigate the significance of the average annual increase in scores. Note that because the score in Table 1 reflect unadjusted raw scores for 2017 they are not identical to the growth model scores reported elsewhere, which are based on the trajectory of scores from 2012-2017. Detailed results from the statistical models of average annual growth are described in the sections that follow.

**Changes in Total Scores from 2012 to 2017**

Using total school climate scores on the Delaware School Climate Scale-Student, results of the unconditional linear growth model with a linear time effect are shown in Table 2. In school climate research, grade level (i.e. elementary, middle, or high school) is considered an important factor influencing students’ perceptions of school climate. Thus, separate analyses were conducted for elementary, middle, and high schools.

As shown in Table 2, for elementary schools the estimated total school climate score for 2017 was 3.20. Regarding growth rate, on average there was an increase of .019 points per year in students’ perceptions of school climate from 2012 to 2017. For middle school students, the estimate total school climate score for 2017 was 2.90, with a significant growth rate of .034 points per year. For high school students, the estimate total school climate score for 2017 was 2.78, with a significant growth rate of .031 points per year. The mean intercepts and growth rates have large *t* statistics suggesting that both parameters are necessary for describing the mean growth trajectory. Thus, results indicate that overall school climate scores based on students’ perceptions improved from 2012 to 2017 in elementary, middle and high schools. However, it should be noted schools varied greatly in their scores and growth rates, with not all schools improving (See details in Appendix).

**Changes in Subscale Scores from 2012 to 2017**

Similar to the previous models, separate linear growth models were conducted for each of the seven subscales: teacher-student relations, student-student relations, clarity of expectations, fairness of school rules, school safety, student engagement, and bullying school-wide as outcomes for elementary, middle, and high schools. Those results are also presented in Table 2. Results for each subscale are summarized below.

***Teacher-student relations*.** Across each of the three grade levels, teacher-student relations subscale scores improved significantly from 2012 to 2017. For elementary schools, the estimated score for 2017 was 3.60 points. On average, there was an increase of .019 points per year in students’ perceptions. For middle schools, the estimated score for 2017 was 3.20, with an average annual increase of .053. For high schools, the estimated score for 2017 was 2.95, with an average annual increase of .053.

***Student-student relations***. Across each of the three grade levels, scores improved significantly from 2012 to 2017. For elementary schools, the estimated score for 2017 was 2.99. There was an average increase of .027 points per year in students’ perceptions. For middle schools, the estimated score for 2017 was 2.64, with an average increase of .029. For high schools, the estimated score for 2017 was 2.62, with an average increase of .027.

***Clarity of behavioral expectations***. Across each of the three grade levels, scores improved significantly from 2012 to 2017. For elementary schools, the estimated score for 2017 was 3.33. In terms of growth rate, on average there was an increase of .008 points per year in students’ perceptions. For middle schools, the estimated score for 2017 was 3.15, with an average annual increase of .025. For high schools, the estimated score for 2017 was 3.03, with an average annual increase of .029.

***Fairness of school rules***. Across each of the three grade levels, scores improved significantly from 2012 to 2017. For elementary schools, the estimated score for 2017 was 3.30. In terms of growth rate, on average there was an increase of .013 points per year in students’ perceptions. For middle schools, the estimated score for 2017 was 2.99, with an average annual increase of .037. For high schools, the estimated score for 2017 was 2.79, with an average annual increase of .032.

***School safety.*** Across each of the three grade levels scores, improved significantly from 2012 to 2017.The estimated 2017 scores were 3.36 and average growth rate was .021 for elementary students. For middle school, the estimated 2017 score was 2.96 and the growth rate was .031. For high school, the estimated 2017 score was 2.83 and the growth rate was .030.

***Student engagement***. Across each of the three grade levels, scores improved significantly from 2012 to 2017. For elementary schools, the estimated score for 2017 was 3.16. In terms of growth rate, on average there was an increase of .013 points per year in students’ perceptions from 2012 to 2017. For middle schools, the estimated score for 2017 was 2.80, with an average annual increase of .030. For high schools, the estimated score for 2017 was 2.68, with an average annual increase of .045.

***Bullying school-wide.*** Elementary and high school scores improved (i.e., bullying scores decreased) significantly from 2012 to 2017. For elementary schools, the estimated score for 2017 was 2.41. In terms of growth rate, there was an average decrease of .031 points per year in students’ perceptions from 2012 to 2017. For middle schools, the estimated score for 2017 was 2.50. The growth rate was not statistically significant and the estimation was .013. For high schools, the estimated score for 2017 was 2.36, with a decrease rate of .030.

Table 1*. Descriptive Statistics of* *School Climate Total Scale and Subscales Scores*

|  |  |  |  |
| --- | --- | --- | --- |
| Data point | Elementary | Middle | High |
| *M(SD)* | *N* | Range | *M(SD)* | *N* | Range | *M(SD)* | *N* | Range |
| School climate total score |  |  |  |  |  |  |  |  |  |
|  2012 | 3.09(0.17) | 84 | 2.62-3.58 | 2.71(0.13) | 28 | 2.43-2.93 | 2.59(0.13) | 29 | 2.35-2.99 |
|  2013 | 3.14(0.17) | 88 | 2.6-3.84 | 2.78(0.12) | 28 | 2.54-3.01 | 2.63(0.09) | 18 | 2.48-2.81 |
|  2014 | 3.17(0.15) | 73 | 2.78-3.75 | 2.80(0.12) | 26 | 2.56-3.06 | 2.68(0.11) | 18 | 2.54-2.98 |
|  2015 | 3.15(0.13) | 78 | 2.76-3.4 | 2.81(0.13) | 27 | 2.49-3.02 | 2.73(0.13) | 20 | 2.57-3.22 |
|  2016 | 3.18(0.14) | 79 | 2.75-3.46 | 2.83(0.14) | 26 | 2.47-3.07 | 2.72(0.10) | 20 | 2.57-2.91 |
|  2017 | 3.21(0.11) | 57 | 2.89-3.44 | 2.91(0.10) | 22 | 2.68-3.16 | 2.78(0.14) | 17 | 2.52-3.14 |
|  |  |  |  |  |  |  |  |  |  |
| Teacher-student relations |  |  |  |  |  |  |  |  |  |
|  2012 | 3.49(0.14) | 84 | 3.05-3.83 | 2.91(0.14) | 28 | 2.56-3.18 | 2.67(0.11) | 19 | 2.48-3.01 |
|  2013 | 3.53(0.14) | 88 | 3.14-3.95 | 3.00(0.12) | 28 | 2.77-3.24 | 2.75(0.07) | 18 | 2.64-2.89 |
|  2014 | 3.54(0.11) | 74 | 3.25-3.86 | 3.02(0.12) | 26 | 2.69-3.23 | 2.77(0.08) | 18 | 2.70-3.03 |
|  2015 | 3.54(0.10) | 78 | 3.29-3.75 | 3.04(0.12) | 27 | 2.76-3.23 | 2.82(0.12) | 20 | 2.68-3.23 |
|  2016 | 3.63(0.10) | 79 | 3.31-3.85 | 3.24(0.11) | 26 | 2.97-3.45 | 3.02(0.07) | 20 | 2.91-3.25 |
|  2017 | 3.56(0.09) | 57 | 3.32-3.72 | 3.11(0.12) | 22 | 2.86-3.38 | 2.85(0.15) | 17 | 2.59-3.18 |
|  |  |  |  |  |  |  |  |  |  |
| Student-student relations |  |  |  |  |  |  |  |  |  |
|  2012 | 2.82(0.24) | 84 | 2.11-3.32 | 2.47(0.15) | 28 | 2.12-2.71 | 2.46(0.15) | 19 | 2.17-2.88 |
|  2013 | 2.90(0.27) | 88 | 1.94-3.83 | 2.54(0.15) | 28 | 2.26-2.84 | 2.46(0.13) | 18 | 2.27-2.70 |
|  2014 | 2.93(0.23) | 74 | 2.28-3.64 | 2.54(0.16) | 26 | 2.19-2.91 | 2.52(0.15) | 18 | 2.28-2.88 |
|  2015 | 2.96(0.20) | 78 | 2.38-3.28 | 2.58(0.16) | 27 | 2.19-2.87 | 2.60(0.13) | 20 | 2.39-3.04 |
|  2016 | 2.96(0.21) | 79 | 2.36-3.38 | 2.57(0.17) | 26 | 2.16-2.84 | 2.57(0.15) | 20 | 2.35-2.94 |
|  2017 | 2.96(0.19) | 57 | 2.40-3.34 | 2.64(0.14) | 22 | 2.39-2.96 | 2.63(0.17) | 17 | 2.31-2.99 |
|  |  |  |  |  |  |  |  |  |  |

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Table 1 (continued)*. Descriptive Statistics of* *School Climate Total Scale and Subscales Scores*

|  |  |  |  |
| --- | --- | --- | --- |
| Data point | Elementary | Middle | High |
| *M(SD)* | *N* | Range | *M(SD)* | *N* | Range | *M(SD)* | *N* | Range |
|  |  |  |  |  |  |  |  |  |  |
| Clarity of expectations |  |  |  |  |  |  |  |  |  |
|  2012 | 3.28(0.15) | 84 | 2.78-3.71 | 3.00(0.12) | 28 | 2.77-3.22 | 2.85(0.14) | 19 | 2.54-3.15 |
|  2013 | 3.31(0.14) | 88 | 2.96-3.91 | 3.06(0.09) | 28 | 2.81-3.20 | 2.91(0.09) | 18 | 2.78-3.18 |
|  2014 | 3.32(0.13) | 74 | 3.01-3.82 | 3.08(0.09) | 26 | 2.93-3.29 | 2.94(0.08) | 18 | 2.84-3.13 |
|  2015 | 3.31(0.11) | 78 | 2.99-3.55 | 3.08(0.10) | 27 | 2.89-3.25 | 2.99(0.11) | 20 | 2.87-3.38 |
|  2016 | 3.32(0.13) | 79 | 2.92-3.64 | 3.09(0.10) | 26 | 2.80-3.28 | 2.97(0.11) | 20 | 2.72-3.20 |
|  2017 | 3.34(0.09) | 57 | 3.06-3.56 | 3.16(0.07) | 22 | 3.01-3.32 | 3.02(0.12) | 17 | 2.83-3.31 |
|  |  |  |  |  |  |  |  |  |  |
| Fairness of school rules |  |  |  |  |  |  |  |  |  |
|  2012 | 3.22(0.16) | 84 | 2.81-3.67 | 2.75(0.16) | 28 | 2.31-3.07 | 2.58(0.14) | 19 | 2.29-2.95 |
|  2013 | 3.25(0.16) | 88 | 2.81-3.94 | 2.87(0.13) | 28 | 2.48-3.09 | 2.69(0.08) | 18 | 2.58-2.88 |
|  2014 | 3.29(0.16) | 74 | 2.87-3.83 | 2.91(0.12) | 26 | 2.57-3.15 | 2.73(0.10) | 18 | 2.59-3.02 |
|  2015 | 3.26(0.13) | 78 | 2.86-3.58 | 2.91(0.12) | 27 | 2.52-3.17 | 2.75(0.18) | 20 | 2.47-3.31 |
|  2016 | 3.29(0.13) | 79 | 2.85-3.58 | 2.92(0.14) | 26 | 2.53-3.19 | 2.73(0.14) | 20 | 2.52-3.05 |
|  2017 | 3.27(0.11) | 57 | 3.00-3.48 | 2.97(0.10) | 22 | 2.79-3.20 | 2.76(0.16) | 17 | 2.41-3.18 |
|  |  |  |  |  |  |  |  |  |  |
| School safety |  |  |  |  |  |  |  |  |  |
|  2012 | 3.20(0.21) | 84 | 2.55-3.68 | 2.75(0.21) | 28 | 2.24-3.07 | 2.63(0.22) | 19 | 2.11-3.13 |
|  2013 | 3.31(0.20) | 88 | 2.50-3.93 | 2.86(0.20) | 28 | 2.28-3.17 | 2.63(0.18) | 18 | 2.32-2.93 |
|  2014 | 3.34(0.18) | 74 | 2.75-3.82 | 2.90(0.19) | 26 | 2.44-3.25 | 2.75(0.21) | 18 | 2.40-3.17 |
|  2015 | 3.30(0.16) | 78 | 2.81-3.59 | 2.86(0.21) | 27 | 2.32-3.19 | 2.78(0.20) | 20 | 2.49-3.42 |
|  2016 | 3.32(0.15) | 79 | 2.80-3.60 | 2.85(0.22) | 26 | 2.35-3.28 | 2.75(0.17) | 20 | 2.47-3.00 |
|  2017 | 3.36(0.14) | 57 | 2.93-3.58 | 2.99(0.16) | 22 | 2.57-3.28 | 2.85(0.18) | 17 | 2.58-3.27 |
|  |  |  |  |  |  |  |  |  |  |
| Student engagement |  |  |  |  |  |  |  |  |  |
|  2012 | 3.07(0.13) | 84 | 2.77-3.50 | 2.62(0.10) | 28 | 2.40-2.82 | 2.42(0.16) | 19 | 2.18-2.87 |
|  2013 | 3.13(0.15) | 88 | 2.59-3.76 | 2.69(0.10) | 28 | 2.49-2.93 | 2.47(0.12) | 18 | 2.29-2.67 |
|  2014 | 3.14(0.12) | 74 | 2.80-3.65 | 2.71(0.10) | 26 | 2.53-2.97 | 2.51(0.13) | 18 | 2.29-2.84 |
|  2015 | 3.13(0.11) | 78 | 2.90-3.33 | 2.73(0.11) | 27 | 2.52-2.91 | 2.61(0.14) | 20 | 2.34-3.07 |
|  2016 | 3.15(0.10) | 79 | 2.94-3.34 | 2.80(0.10) | 22 | 2.59-3.04 | 2.68(0.16) | 17 | 2.31-3.04 |
|  2017 | 3.15(0.11) | 57 | 2.77-3.42 | 2.75(0.11) | 26 | 2.46-2.92 | 2.62(0.16) | 20 | 2.37-3.09 |
|  |  |  |  |  |  |  |  |  |  |
| Bullying school-wide |  |  |  |  |  |  |  |  |  |
|  2012 | 2.56(0.25) | 78 | 1.61-3.12 | 2.47(0.23) | 26 | 1.98-2.88 | 2.55(0.24) | 15 | 2.23-3.12 |
|  2013 | 2.53(0.30) | 88 | 1.47-3.22 | 2.59(0.19) | 28 | 2.25-3.07 | 2.53(0.15) | 18 | 2.27-2.82 |
|  2014 | 2.48(0.30) | 74 | 1.41-3.11 | 2.60(0.19) | 26 | 2.22-2.95 | 2.47(0.17) | 18 | 2.15-2.75 |
|  2015 | 2.58(0.28) | 78 | 1.99-3.29 | 2.62(0.21) | 27 | 2.16-3.02 | 2.46(0.18) | 20 | 1.83-2.67 |
|  2016 | 2.42(0.28) | 79 | 1.75-3.07 | 2.48(0.21) | 26 | 2.12-2.82 | 2.38(0.13) | 20 | 2.15-2.61 |
|  2017 | 2.35(0.26) | 57 | 1.62-2.89 | 2.42(0.17) | 22 | 2.08-2.71 | 2.34(0.17) | 17 | 1.98-2.65 |
|  |  |  |  |  |  |  |  |  |  |

Table 2 *Linear Model of Growth Rate in School Climate and Subscales Scores as Outcomes*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *Outcomes* | *Coefficient* | *SE* | *t Ratio* | *Effect size* |
| Elementary Schools |  |  |  |  |
|  School Climate | 0.019 | 0.003 | 6.51\*\*\* | 0.28 |
|  Teacher-student relations | 0.019 | 0.003 | 6.97\*\*\* | 0.25 |
|  Student-student relations | 0.027 | 0.004 | 6.42\*\*\* | 0.25 |
|  Clarity of expectations  | 0.008 | 0.003 | 2.31\* | 0.12 |
|  Fairness of school rules | 0.013 | 0.003 | 4.06\*\*\* | 0.16 |
|  School safety | 0.021 | 0.003 | 6.06\*\*\* | 0.21 |
|  Student engagement | 0.013 | 0.003 | 4.56\*\*\* | 0.17 |
|  Bullying school-wide | -0.031 | 0.006 | -4.90\*\*\* | -0.18 |
|  |  |  |  |  |
| Middle Schools |  |  |  |  |
|  School Climate | 0.034 | 0.005 | 6.70\*\*\* | 0.68 |
|  Teacher-student relations | 0.053 | 0.005 | 10.56\*\*\* | 0.54 |
|  Student-student relations | 0.029 | 0.007 | 4.11\*\* | 0.42 |
|  Clarity of expectations  | 0.025 | 0.004 | 6.83\*\*\* | 0.48 |
|  Fairness of school rules | 0.037 | 0.005 | 7.13\*\*\* | 0.55 |
|  School safety | 0.031 | 0.007 | 4.21\*\* | 0.33 |
|  Student engagement | 0.030 | 0.005 | 6.37\*\*\* | 0.49 |
|  Bullying school-wide | -0.013 | 0.008 | -1.76 | -0.09 |
|  |  |  |  |  |
| High Schools |  |  |  |  |
|  School Climate | 0.031 | 0.006 | 5.13\*\*\* | 0.52 |
|  Teacher-student relations | 0.053 | 0.006 | 8.39\*\*\* | 0.50 |
|  Student-student relations | 0.027 | 0.008 | 3.56\*\* | 0.36 |
|  Clarity of expectations  | 0.029 | 0.006 | 4.55\*\*\* | 0.43 |
|  Fairness of school rules | 0.032 | 0.008 | 3.97\*\* | 0.38 |
|  School safety | 0.030 | 0.007 | 4.1\*\* | 0.35 |
|  Student engagement | 0.045 | 0.007 | 6.07\*\*\* | 0.52 |
|  Bullying school-wide | -0.030 | 0.008 | -3.67\*\* | -0.28 |
|  |  |  |  |  |

*Note. \*\* p* < .01, \*\*\* *p* < .001. Effect size is calculated by dividing the coefficient of growth rate by the pooled within-year standard deviation. **Appendix**

Detailed information on the statistical model for school climate total scores are presented in Table 3. As mentioned earlier, even though the average of the increase in school climate and its subscales are significant, the variance for both school climate in 2017 and growth rate are large relative to the averages.

 For elementary schools, the variance of school climate in 2017, 0.015, corresponds to an *SD* of 0.12, which means that 95% of the population vary between ±0.24 (2.96, 3.44) points of the main perceptions in 2017. The growth rate variance is 0.003, which indicates that 95% of the population vary between ± 0.04 (-0.019, 0.038) points of the mean growth rate.

For middle schools, the variance of school climate in 2017 is 0.020 corresponds to an *SD* of √0. 02 = 0.14, which means that 95% of the population vary between ± .27 (2.62, 3.17) points of the main perceptions in 2017. The growth rate variance is .001, which indicates that 95% of the population vary between ± .04 (-0.010, 0.078) points of the mean growth rate.

For high schools, the variance of school climate in 2017, 0.012 corresponds to an *SD* of √ .012 = .11, which means that 95% of the population vary between ± .22 (2.56, 3.00) points of the main perceptions in 2017. The growth rate variance is .001, which indicates that 95% of the population vary between ± .04 (-0.014, 0.075) points of the mean growth rate.

Table 3 *Linear Model of Growth in School Climate*

|  |  |  |  |
| --- | --- | --- | --- |
| Model effects | *Estimate* | *se* | *t* ratio (*df*) |
| *Fixed effects* |  |  |  |
| Elementary schools |  |  |  |
|  Main perceptions in 2017 | 3.20 | 0.015 | 220.17 (92) \*\*\* |
|  Main growth rate | 0.019 | 0.003 | 6.51 (92) \*\*\* |
| Middle schools |  |  |  |
|  Main perceptions in 2017 | 2.90 | 0.026 | 108.98 (32) \*\*\* |
|  Main growth rate | 0.034 | 0.005 | 6.70 (31) \*\*\* |
| High schools |  |  |  |
|  Main perceptions in 2017 | 2.78 | 0.025 | 112.66 (28) \*\*\* |
|  Main growth rate | 0.031 | 0.007 | 5.13 (24) \*\*\* |
| *Random effect* | *Standard deviation* |  *Variance* | *Z value* |
| Elementary schools |  |  |  |
|  Final Status | 0.124 | 0.015 | 4.91\*\*\* |
|  Growth rate | 0.019 | 0.001 | 3.30\*\*\* |
|  Level-1 error |  | 0.004 | 11.89\*\*\* |
| Middle Schools |  |  |  |
|  Final Status | 0.140 | 0.020 | 3.16\*\*\* |
|  Growth rate | 0.023 | 0.001 | 2.49\*\* |
|  Level-1 error |  | 0.003 | 6.74\*\*\* |
| High Schools |  |  |  |
|  Final Status | 0.111 | 0.012 | 2.88\*\* |
|  Growth rate | 0.023 | 0.001 | 1.87\* |
|  Level-1 error |  | 0.004 | 5.54\*\*\* |

*Note. \* p* < .05, *\*\* p* < .01, \*\*\* *p* < .001.