



Marzano High Reliability Schools

A Summary of Parent and Student Perceptions Regarding Leading Indicators for Level 1

Prepared by Marzano Resources

for

Loyal School District

Loyal, Wisconsin

September 2023



**Our
Vision**

Transform education worldwide
to ensure learning for all.

**Our
Mission**

Advance the work of our authors.

REPORT AUTHOR

Mark W. Haystead

MARZANO RESOURCES – BLOOMINGTON, IN

Business Office
555 N. Morton Street
Bloomington, IN 47404
Phone: 888-849-0851
Fax: 866-801-1447

MARZANO RESOURCES – CENTENNIAL, CO

Resource Development Center
12577 E. Caley Avenue
Centennial, CO 80111
Phone: 303-766-9199
Fax: 303-694-1778

www.MarzanoResources.com

Table of Contents

Table of Contents	i
Introduction.....	1
Data Analysis and Findings	2
Leading Indicator 1.1: The faculty and staff perceive the school environment as safe and orderly.	3
Leading Indicator 1.2: Students, parents, and the community perceive the school environment as safe and orderly.	3
Leading Indicator 1.3: Teachers have formal roles in the decision-making process regarding school initiatives.....	4
Leading Indicator 1.4: Teacher teams and collaborative groups regularly interact to address common issues regarding curriculum, assessment, instruction, and the achievement of all students.....	5
Leading Indicator 1.5: Teachers and staff have formal ways to provide input regarding the optimal functioning of the school.	5
Leading Indicator 1.6: Students, parents, and the community have formal ways to provide input regarding the optimal functioning of the school.....	6
Leading Indicator 1.7: The success of the whole school, as well as individuals within the school, is appropriately acknowledged.	7
Leading Indicator 1.8: The fiscal, operational, and technological resources of the school are managed in a way that directly supports teachers.	8
Summary and Discussion.....	9
Technical Note	10
References.....	12

Introduction

Parents, guardians, students, and other stakeholders at Loyal School District responded to an online survey designed to gauge their school's status on the first level of the Marzano High Reliability Schools (HRS) framework. Level 1 has eight leading indicators that address factors considered foundational to developing and maintaining a safe, supportive, and collaborative school culture:

Leading Indicator 1.1: The faculty and staff perceive the school environment as safe and orderly.

Leading Indicator 1.2: Students, parents, and the community perceive the school environment as safe and orderly.

Leading Indicator 1.3: Teachers have formal roles in the decision-making process regarding school initiatives.

Leading Indicator 1.4: Teacher teams and collaborative groups meet regularly to interact and address common issues regarding curriculum, assessment, instruction, and the achievement of all students.

Leading Indicator 1.5: Teachers and staff have formal ways to provide input regarding the optimal functioning of the school.

Leading Indicator 1.6: Students, parents, and the community have formal ways to provide input regarding optimal functioning of our school.

Leading Indicator 1.7: The success of the whole school, as well as individuals within the school, is appropriately acknowledged.

Leading Indicator 1.8: The fiscal, operational, and technological resources of the school are managed in a way that directly supports teachers.

These leading indicators were designed to help school leaders determine what is already working well and identify areas in need of focused attention. (For a more thorough discussion of HRS, see Marzano, Warrick, & Simms, 2014)

School stakeholders anonymously rated their level of agreement with statements related to each leading indicator. The survey had five response choices ordered from greatest disagreement to greatest agreement (numeric values noted in parentheses): strongly disagree (1), disagree (2), neither disagree nor agree (3), agree (4), and strongly agree (5). Stakeholders were allowed to respond to any statement with a rating of *n/a* or *don't know*.

To provide an aggregate summary of respondents' ratings of agreement, three descriptive statistics were calculated from the numeric values: (1) mean, (2) mode, and (3) standard deviation. The mean is the arithmetic average of the numeric values of the respondents' ratings, the mode is the most common value(s) selected by respondents, and standard deviation is a measure of the amount of variation among the numeric values. (For a more detailed discussion, see Technical Note.) It should be noted that ratings of *n/a* or *don't know* were treated as missing and excluded from the descriptive statistics.

Data Analysis and Findings

Table 1 displays the number of surveys that were completed by parents/guardians and students at Loyal School District.

Table 1: Completed Survey Counts

Completed Survey Counts	
Parent/Guardian	122
Student	207

Again, school stakeholders responded to survey items using a 5-point agreement scale. In addition to calculating means from the numeric values of respondents' ratings for each item, overall means were calculated from the item means for each leading indicator. Descriptive statistics for each leading indicator are presented separately. As noted earlier, ratings of *n/a* or *don't know* were excluded from the descriptive statistics. Additional consideration might be warranted for any survey item with a lower than anticipated response count. Finally, it is important to note that reported findings are limited to the perceptions of those who completed the survey at the time they completed it, and not necessarily representative of other parents or students. The closer the number of completed responses is to the number of parents and students at the school, the more representative the results are likely to be.

Means greater than 3.5 suggest most respondents agreed with a survey item. Means less than 2.5 suggest most respondents disagreed. Means close to 3.0 suggest: (1) similar numbers of respondents who agreed and disagreed and/or (2) more respondents who neither disagreed nor agreed.

Leading Indicator 1.1: The faculty and staff perceive the school environment as safe and orderly.

Tables 2 and 3 list the descriptive statistics for leading indicator 1.1.

Table 2: Descriptive Statistics for Leading Indicator 1.1 (Parent/Guardian)

Survey Item	<i>M</i>	<i>SD</i>	<i>Mode</i>	<i>n</i>
Teachers and staff at my child's school consider it a safe place.	3.84	1.03	4	114
Teachers and staff at my child's school consider it an orderly place.	3.49	1.09	4	112
My child's school has clear and specific rules and procedures in place.	3.48	1.22	4	120
Teachers, staff, and my child know the emergency management procedures for the school.	3.92	0.86	4	106
Teachers, staff, and my child know how to implement the emergency management procedures for the school.	3.83	0.85	4	101
Teachers, staff, and my child have practiced implementing emergency management procedures for specific incidents (for example, tornado drills, fire drills, or lockdown drills).	4.04	0.69	4	106
The emergency management procedures at my child's school are updated on a regular basis.	3.63	0.99	4	82

Note. *M* = arithmetic mean; *SD* = standard deviation; *Mode* = most common response(s); *n* = valid response count.

Table 2 indicates that parents'/guardians' mean item responses for leading indicator 1.1 ranged from 3.48 to 4.04. The overall mean (with standard deviation in parentheses) was 3.75 (0.22).

Table 3: Descriptive Statistics for Leading Indicator 1.1 (Student)

Survey Item	<i>M</i>	<i>SD</i>	<i>Mode</i>	<i>n</i>
I know what to do if an emergency happens at school (such as a tornado, fire, lockdown, or medical emergency).	4.35	0.73	4	202

Note. *M* = arithmetic mean; *SD* = standard deviation; *Mode* = most common response(s); *n* = valid response count.

Table 3 indicates that students' mean item response for leading indicator 1.1 was 4.35.

Leading Indicator 1.2: Students, parents, and the community perceive the school environment as safe and orderly.

Tables 4 and 5 list the descriptive statistics for leading indicator 1.2.

Table 4: Descriptive Statistics for Leading Indicator 1.2 (Parent/Guardian)

Survey Item	<i>M</i>	<i>SD</i>	<i>Mode</i>	<i>n</i>
My child's school is a safe place.	3.71	1.03	4	119
My child's school is an orderly place.	3.42	1.08	4	121
I am aware of the rules and procedures in place at my child's school.	3.58	1.09	4	118
My child's school uses social media to allow anonymous reporting of potential incidents.	2.93	1.25	3	74
My child's school has a system that allows school leaders to communicate with me about issues regarding school safety (for example, a school call-out system).	3.74	0.97	4	107
The leaders of my child's school coordinate with local law enforcement agencies regarding school safety issues.	3.64	1.07	4	104
The leaders of my child's school engage the community and me regarding school safety issues.	3.00	1.27	4	112

Note. *M* = arithmetic mean; *SD* = standard deviation; *Mode* = most common response(s); *n* = valid response count.

Table 4 indicates that parents'/guardians' mean item responses for leading indicator 1.2 ranged from 2.93 to 3.74. The overall mean was 3.43 (0.34).

Table 5: Descriptive Statistics for Leading Indicator 1.2 (Student)

Survey Item	<i>M</i>	<i>SD</i>	<i>Mode</i>	<i>n</i>
My school is a safe place.	4.07	0.84	4	201
My school is an orderly place.	3.84	0.79	4	195
I know the rules and procedures at my school.	4.31	0.70	4	202
I can use social media to report bullying or other incidents anonymously.	3.09	1.27	4	153

Note. *M* = arithmetic mean; *SD* = standard deviation; *Mode* = most common response(s); *n* = valid response count.

Table 5 indicates that students' mean item responses for leading indicator 1.2 ranged from 3.09 to 4.31. The overall mean was 3.83 (0.53).

Leading Indicator 1.3: Teachers have formal roles in the decision-making process regarding school initiatives.

Tables 6 and 7 list the descriptive statistics for leading indicator 1.3.

Table 6: Descriptive Statistics for Leading Indicator 1.3 (Parent/Guardian)

Survey Item	<i>M</i>	<i>SD</i>	<i>Mode</i>	<i>n</i>
Teachers help make important decisions at my child's school.	2.90	1.27	2	105
Specific groups of teachers provide input regarding specific decisions at my child's school	3.29	1.25	4	95

Note. *M* = arithmetic mean; *SD* = standard deviation; *Mode* = most common response(s); *n* = valid response count.

Table 6 indicates that parents’/guardians’ mean item responses for leading indicator 1.3 were 2.90 and 3.29. The overall mean was 3.09 (0.28).

Table 7: Descriptive Statistics for Leading Indicator 1.3 (Student)

Survey Item	<i>M</i>	<i>SD</i>	<i>Mode</i>	<i>n</i>
Teachers help make important decisions at my school.	3.95	0.96	4	197

Note. *M* = arithmetic mean; *SD* = standard deviation; *Mode* = most common response(s); *n* = valid response count.

Table 7 indicates that students’ mean item response for leading indicator 1.3 was 3.95.

Leading Indicator 1.4: Teacher teams and collaborative groups regularly interact to address common issues regarding curriculum, assessment, instruction, and the achievement of all students.

Tables 8 and 9 list the descriptive statistics for leading indicator 1.4.

Table 8: Descriptive Statistics for Leading Indicator 1.4 (Parent/Guardian)

Survey Item	<i>M</i>	<i>SD</i>	<i>Mode</i>	<i>n</i>
Teachers at my child’s school meet together on a regular basis.	3.44	1.11	4	78
At my child’s school, teachers who teach the same subject use the same exams, quizzes, and tests.	3.17	1.09	4	53
Teams of teachers at my child’s school look at student achievement data to figure out how to improve students’ learning.	3.25	1.04	4	75

Note. *M* = arithmetic mean; *SD* = standard deviation; *Mode* = most common response(s); *n* = valid response count.

Table 8 indicates that parents’/guardians’ mean item responses for leading indicator 1.4 ranged from 3.17 to 3.44. The overall mean was 3.29 (0.14).

Table 9: Descriptive Statistics for Leading Indicator 1.4 (Student)

Survey Item	<i>M</i>	<i>SD</i>	<i>Mode</i>	<i>n</i>
My teachers meet together on a regular basis.	3.91	0.75	4	152

Note. *M* = arithmetic mean; *SD* = standard deviation; *Mode* = most common response(s); *n* = valid response count.

Table 9 indicates that students’ mean item response for leading indicator 1.4 was 3.91.

Leading Indicator 1.5: Teachers and staff have formal ways to provide input regarding the optimal functioning of the school.

Tables 10 and 11 list the descriptive statistics for leading indicator 1.5.

Table 10: Descriptive Statistics for Leading Indicator 1.5 (Parent/Guardian)

Survey Item	<i>M</i>	<i>SD</i>	<i>Mode</i>	<i>n</i>
The leaders of my child's school ask teachers for their opinions about how the school should function.	2.58	1.33	2	90
The leaders of my child's school collect information from teachers about their opinions.	2.43	1.29	1	87

Note. *M* = arithmetic mean; *SD* = standard deviation; *Mode* = most common response(s); *n* = valid response count.

Table 10 indicates that parents'/guardians' mean item responses for leading indicator 1.5 were 2.58 and 2.43. The overall mean was 2.50 (0.11).

Table 11: Descriptive Statistics for Leading Indicator 1.5 (Student)

Survey Item	<i>M</i>	<i>SD</i>	<i>Mode</i>	<i>n</i>
My school's leaders collect information from teachers about their opinions.	3.65	0.98	4	135

Note. *M* = arithmetic mean; *SD* = standard deviation; *Mode* = most common response(s); *n* = valid response count.

Table 11 indicates that students' mean item response for leading indicator 1.5 was 3.65.

Leading Indicator 1.6: Students, parents, and the community have formal ways to provide input regarding the optimal functioning of the school.

Tables 12 and 13 list the descriptive statistics for leading indicator 1.6.

Table 12: Descriptive Statistics for Leading Indicator 1.6 (Parent/Guardian)

Survey Item	<i>M</i>	<i>SD</i>	<i>Mode</i>	<i>n</i>
The leaders of my child's school ask for my opinion about how the school should function.	2.35	1.24	1	115
The leaders of my child's school have a system to save and keep track of the information they collect about my opinions.	2.32	1.23	1	69
Reports of opinion data collected from students, parents, and the community are generated regularly.	2.15	1.12	2	84
I understand how my opinions affect school decisions.	2.72	1.21	2	104
My child's school hosts an interactive website.	3.32	1.10	4	111
I visit my child's school's website often.	3.51	1.07	4	121
The leaders and teachers at my child's school use social networking technologies (such as Facebook) to involve students, parents, and the community.	3.76	0.99	4	118
The leaders of my child's school host virtual town hall meetings.	2.45	1.25	2	85
The leaders of my child's school conduct focus group meetings with students, parents, and the community.	2.34	1.20	2	92
The leaders of my child's school host or speak at community/business luncheons.	2.21	1.11	2	85

Note. *M* = arithmetic mean; *SD* = standard deviation; *Mode* = most common response(s); *n* = valid response count.

Table 12 indicates that parents'/guardians' mean item responses for leading indicator 1.6 ranged from 2.15 to 3.76. The overall mean was 2.71 (0.59).

Table 13: Descriptive Statistics for Leading Indicator 1.6 (Student)

Survey Item	<i>M</i>	<i>SD</i>	<i>Mode</i>	<i>n</i>
My school's leaders ask for my opinion about how the school should function.	2.75	1.35	1	181

Note. *M* = arithmetic mean; *SD* = standard deviation; *Mode* = most common response(s); *n* = valid response count.

Table 13 indicates that students' mean item response for leading indicator 1.6 was 2.75.

Leading Indicator 1.7: The success of the whole school, as well as individuals within the school, is appropriately acknowledged.

Tables 14 and 15 list the descriptive statistics for leading indicator 1.7.

Table 14: Descriptive Statistics for Leading Indicator 1.7 (Parent/Guardian)

Survey Item	<i>M</i>	<i>SD</i>	<i>Mode</i>	<i>n</i>
The accomplishments of my child's school have been adequately acknowledged and celebrated.	3.30	1.02	4	111
The accomplishments of my child's teachers have been adequately acknowledged and celebrated.	3.04	1.17	4	106
My child's individual accomplishments have been adequately acknowledged and celebrated.	3.38	0.97	4	116
The leaders of my child's school acknowledge and celebrate individual accomplishments, teacher-team/department accomplishments, and whole-school accomplishments in a variety of ways (for example, through faculty celebrations, newsletters to parents, or announcements; on the school website; or using social media).	3.15	1.16	4	110

Note. *M* = arithmetic mean; *SD* = standard deviation; *Mode* = most common response(s); *n* = valid response count.

Table 14 indicates that parents'/guardians' mean item responses for leading indicator 1.7 ranged from 3.04 to 3.38. The overall mean was 3.21 (0.15).

Table 15: Descriptive Statistics for Leading Indicator 1.7 (Student)

Survey Item	<i>M</i>	<i>SD</i>	<i>Mode</i>	<i>n</i>
When I achieve a goal or accomplish something important, my school's leaders, my teachers, and other students celebrate it.	3.20	1.13	4	193

Note. *M* = arithmetic mean; *SD* = standard deviation; *Mode* = most common response(s); *n* = valid response count.

Table 15 indicates that students' mean item response for leading indicator 1.7 was 3.20.

Leading Indicator 1.8: The fiscal, operational, and technological resources of the school are managed in a way that directly supports teachers.

Tables 16 and 17 list the descriptive statistics for leading indicator 1.8.

Table 16: Descriptive Statistics for Leading Indicator 1.8 (Parent/Guardian)

Survey Item	<i>M</i>	<i>SD</i>	<i>Mode</i>	<i>n</i>
Teachers at my child's school have adequate materials to teach effectively.	3.23	1.14	4	97
Teachers at my child's school have adequate time to teach effectively.	3.56	1.03	4	98
The leaders of my child's school develop, submit, and implement detailed budgets.	3.04	1.19	4	72
The leaders of my child's school successfully access and leverage a variety of fiscal resources (such as grants or title funds).	3.04	1.17	4	76
The leaders of my child's school manage time to maximize a focus on instruction.	2.91	1.19	4	100
The leaders of my child's school direct the use of technology to improve teaching and learning.	3.51	0.99	4	105

Note. *M* = arithmetic mean; *SD* = standard deviation; *Mode* = most common response(s); *n* = valid response count.

Table 16 indicates that parents'/guardians' mean item responses for leading indicator 1.8 ranged from 2.91 to 3.56. The overall mean was 3.22 (0.27).

Table 17: Descriptive Statistics for Leading Indicator 1.8 (Student)

Survey Item	<i>M</i>	<i>SD</i>	<i>Mode</i>	<i>n</i>
I have plenty of time to learn.	3.98	0.94	4	198
Teachers in my school use technology to help me learn.	4.02	0.86	4	201

Note. *M* = arithmetic mean; *SD* = standard deviation; *Mode* = most common response(s); *n* = valid response count.

Table 17 indicates that students' mean item responses for leading indicator 1.8 were 3.98 and 4.02. The overall mean was 4.00 (0.03).

Summary and Discussion

Parents, guardians, students, and other stakeholders at Loyal School District responded to an online survey designed to gauge their school's status on the first level of the Marzano High Reliability Schools (HRS) framework. The survey had five response choices ordered from greatest disagreement to greatest agreement (numeric values noted in parentheses): strongly disagree (1), disagree (2), neither disagree nor agree (3), agree (4), and strongly agree (5). In addition, stakeholders were allowed to respond to any item with a rating of *n/a* or *don't know*.

Table 18 summarizes the overall means for each leading indicator (means and standard deviations were calculated from the reported survey-item means).

Table 18: Overall Means for Level 1 Leading Indicators

Leading Indicator	Parent/Guardian		Student	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
1.1: The faculty and staff perceive the school environment as safe and orderly.	3.75	0.22	4.35	
1.2: Students, parents, and the community perceive the school environment as safe and orderly.	3.43	0.34	3.83	0.53
1.3: Teachers have formal roles in the decision-making process regarding school initiatives.	3.09	0.28	3.95	
1.4: Teacher teams and collaborative groups regularly interact to address common issues regarding curriculum, assessment, instruction, and the achievement of all students.	3.29	0.14	3.91	
1.5: Teachers and staff have formal ways to provide input regarding the optimal functioning of the school.	2.50	0.11	3.65	
1.6: Students, parents, and the community have formal ways to provide input regarding the optimal functioning of the school.	2.71	0.59	2.75	
1.7: The success of the whole school, as well as individuals within the school, is appropriately acknowledged.	3.21	0.15	3.20	
1.8: The fiscal, operational, and technological resources of the school are managed in a way that directly supports teachers.	3.22	0.27	4.00	0.03

Note. *M* = arithmetic mean; *SD* = standard deviation. Overall means and standard deviations were calculated from item means. The standard deviations reflect the amount of variation among the reported means for each leading indicator.

Table 18 indicates that parents'/guardians' overall means ranged from 2.50 to 3.75. Students' overall means ranged from 2.75 to 4.35.

Again, survey-item means greater than 3.5 suggest most respondents agreed. Means less than 2.5 suggest most respondents disagreed. Means close to 3.0 suggest: (1) similar numbers of respondents who agreed and disagreed and/or (2) more respondents who neither disagreed nor agreed. Also, ratings

of *n/a* or *don't know* were excluded from the descriptive statistics. Therefore, survey items with lower than anticipated response counts might warrant further consideration. Finally, overall means greater than 3.5 suggest respondents agreed with most of the leading indicator survey items, further suggesting the school might be doing well in those areas. Conversely, overall means less than 2.5 suggest respondents disagreed with most of the leading indicator survey items, further suggesting those areas might need focused attention.

Technical Note

In social science research, three statistical measures can be used to describe data sets considered in an analysis: (1) mean, (2) mode, and (3) standard deviation.

To calculate the mean, the sum of scores in a data set is divided by the total number of scores in the set:

$$M = \frac{X_1 + X_2 + \cdots + X_n}{n}$$

As a measure of central tendency, the mean is used to describe the center of a distribution of scores while taking into account every score in the distribution. However, it is important to note that outliers (that is, scores that are very different from most of the distribution) can have a substantial influence on the mean. Consider the following ordered set of numbers: {5, 6, 7, 8, 9, 20}. Although four numbers are less than 9 and one number is greater than 9, the mean suggests that the center of the distribution is slightly higher than 9, $M = 9.17$.

The mode of a data set is the score that appears most frequently. However, it is worth noting that more than one score might appear with the same frequency. In other words, a data set can have more than one mode. A set with two modes is bi-modal, a set with three modes is tri-modal, a set with four modes is quad-modal, and so on. Consider the following ordered set of numbers: {4, 5, 5, 7, 8, 8, 8, 9, 11, 14, 14, 14, 15, 19, 19}. The numbers 4, 7, 9, 11, and 15 occur once; the numbers 5 and 19 occur twice; and the numbers 8 and 14 occur three times. The data set is bi-modal and the modes are 8 and 14.

Standard deviation is related to the variance of a data set. The variance of a data set reflects the amount of error between the mean and the scores in the set ($X_i - M$). Stated differently, the variance provides a measure of the extent to which each score differs from the mean. However, it is important to note that individual errors can be positive or negative depending on whether a score is higher or lower than the mean. Positive and negative errors of the same magnitude (for example, ± 4) would cancel each other out when summed as a measure of total error. Therefore, the sum of squared errors is used to calculate the sample variance instead of the mean of the individual errors:

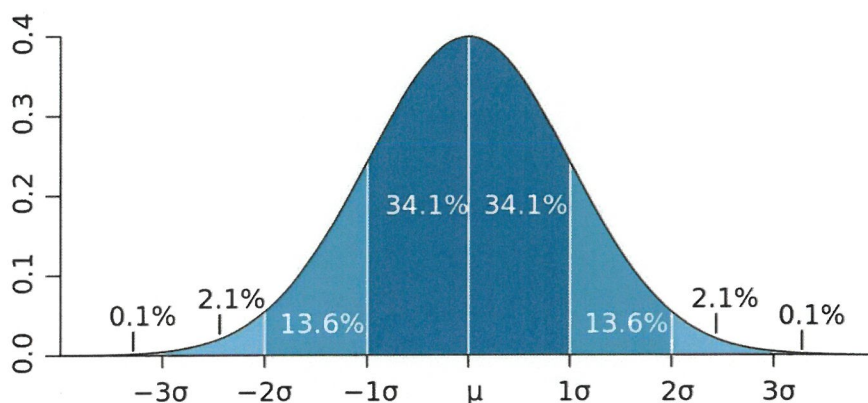
$$s^2 = \frac{(X_1 - M)^2 + (X_2 - M)^2 + \cdots + (X_n - M)^2}{n - 1}$$

The sample standard deviation is the square root of the sample variance:

$$s = \sqrt{\frac{(X_1 - M)^2 + (X_2 - M)^2 + \dots + (X_n - M)^2}{n - 1}}$$

By taking the square root, the average error is expressed in the same units as the original scores in the data set instead of units squared. Standard deviation is used to describe how far the scores are spread out from each other. Generally speaking, the higher the standard deviation, the greater the variation among scores.

When using the mean and standard deviation to describe data sets, it is important to consider the distribution of scores within each set. One widely recognized distribution is the normal distribution (commonly referred to as the bell curve). As Figure TN1 illustrates, a normal distribution is symmetrical with about 68% of the data points lying within one standard deviation of the mean (Lane, n.d.).



Source: Mwtoews, 2007. μ = mean; σ = standard deviation. Image is licensed under the Creative Commons Attribution 2.5 Generic license. <http://creativecommons.org/licenses/by/2.5/deed.en>

Figure TN1: The normal distribution.

Consider a hypothetical data set of 100 numbers from a normal distribution with a mean of 50 and standard deviation of 15. Approximately 68% of the numbers would be one standard deviation from the mean (that is, 50 ± 15) and 95% of the numbers would be two standard deviations from the mean (that is, 50 ± 30). In other words, approximately 14% of the numbers would be between 20 and 35, 34% would be between 35 and 50, 34% would be between 50 and 65, and 14% would be between 65 and 80. Approximately 2% of the numbers would be less than 20 and 2% of the numbers would be greater than 80.

Consider also a 5-point agreement scale: strongly disagree (1), disagree (2), neither disagree nor agree (3), agree (4), and strongly agree (5). If respondents' ratings to a survey item were normally distributed with a mean of 3.0 and standard deviation of 0.5, then approximately 68% of the responses would range

from 2.5 to 3.5 (3.0 ± 0.5), 14% would range from 2.0 to 2.5, and 14% would range from 3.5 to 4.0. Given that the agreement scale contains whole numbers, the mean and standard deviation might suggest the following pattern of responses: approximately 68% of the respondents neither disagreed nor agreed with the survey item, 14% disagreed with the item, and 14% agreed with the item. Generally speaking, the higher the standard deviation, the greater the variation among responses. For instance, if the standard deviation was 1.0 instead of 0.5, approximately 68% of the responses would range from 2.0 to 4.0 (3.0 ± 1.0), 14% would range from 1.0 to 2.0, and 14% would range from 4.0 to 5.0. In other words, the larger standard deviation indicates more diversity among respondents' ratings of agreement.

References

- Lane, D. M. (n.d.). Introduction to normal distributions. In D. Lane (Ed.), *Online statistics education: An interactive multimedia course of study*. Retrieved from <http://onlinestatbook.com>
- Marzano, R. J., Warrick, P., & Simms, J. A. (with Livingston, D., Livingston, P., Pleis, F., Heflebower, T., Hoegh, J. K., & Magaña, S.). (2014). *A handbook for high reliability schools: The next step in school reform*. Bloomington, IN: Marzano Research.
- Mwtoews. (2007, April 7). Standard deviation diagram [Image file]. Retrieved from http://commons.wikimedia.org/wiki/File:Standard_deviation_diagram.svg