# Marzano High Reliability Schools

**A Summary of Administrator and Staff Perceptions Regarding Leading Indicators for Level 2**

Prepared by Marzano Resources

for

Crosslake Community School

Crosslake, Minnesota

January 2023

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# Introduction

Administrative staff, teachers, and other stakeholders at Crosslake Community School responded to an online survey designed to gauge their school's status on the second level of the Marzano High Reliability Schools (HRS) framework. Level 2 has six leading indicators that address factors considered foundational to developing and maintaining effective instruction in every classroom:

Leading Indicator 2.1: The school leader communicates a clear vision as to how instruction should be addressed in the school.

Leading Indicator 2.2: Support is provided to teachers to continually enhance their pedagogical skills through reflection and professional growth plans.

Leading Indicator 2.3: Predominant instructional practices throughout the school are known and monitored.

Leading Indicator 2.4: Teachers are provided with clear, ongoing evaluations of their pedagogical strengths and weaknesses that are based on multiple sources of data and are consistent with student achievement data.

Leading Indicator 2.5: Teachers are provided with job-embedded professional development that is directly related to their instructional growth goals.

Leading Indicator 2.6: Teachers have opportunities to observe and discuss effective teaching.

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. Each statement 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 administrators, teachers, and other staff members at Crosslake Community School.

**Table 1: Completed Survey Counts**

| | Completed Survey Counts |
|---|---|
| **Administrator** | 1 |
| **Teacher/Staff** | 31 |

Again, school stakeholders responded to survey items using a 5-point agreement scale. It should be noted that, 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.

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

**Leading Indicator 2.1: The school leader communicates a clear vision as to how instruction should be addressed in the school.**

Tables 2 and 3 list the descriptive statistics for leading indicator 2.1.

**Table 2: Descriptive Statistics for Leading Indicator 2.1 (Administrator)**

| Survey Item | *M* | *SD* | *Mode* | *n* |
|---|---|---|---|---|
| Teacher leaders and I have developed a written document articulating our schoolwide model of instruction. | 4.00 | | | 1 |
| New teachers have professional development opportunities to learn about our schoolwide model of instruction. | 5.00 | | | 1 |
| I can describe the major components of our schoolwide model of instruction. | 5.00 | | | 1 |
| I limit the number of new initiatives, prioritizing those related to our schoolwide model of instruction. | 5.00 | | | 1 |
| Our school has a common language for talking about teaching and instruction. | 5.00 | | | 1 |
| I use our schoolwide language of instruction in faculty and department meetings. | 5.00 | | | 1 |
| I use our schoolwide language of instruction during PLC meetings. | 5.00 | | | 1 |
| I use our schoolwide language of instruction in informal conversations. | 5.00 | | | 1 |

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

Table 2 indicates that the administrator's item responses for leading indicator 2.1 ranged from 4.00 to 5.00. The overall mean (with standard deviation in parentheses) was 4.88 (0.35).

**Table 3: Descriptive Statistics for Leading Indicator 2.1 (Teacher/Staff)**

| Survey Item | *M* | *SD* | *Mode* | *n* |
|---|---|---|---|---|
| School leaders and teacher leaders have developed a written document articulating our schoolwide model of instruction. | 4.50 | 0.59 | 5 | 24 |
| New teachers have professional development opportunities to learn about our schoolwide model of instruction. | 4.45 | 0.60 | 5 | 22 |
| I can describe the major components of our schoolwide model of instruction. | 4.30 | 0.56 | 4 | 23 |
| School leaders limit the number of new initiatives, prioritizing those related to our schoolwide model of instruction. | 4.35 | 0.57 | 4 | 23 |
| Our school has a common language for talking about teaching and instruction. | 4.50 | 0.66 | 5 | 24 |
| I use our schoolwide language of instruction in faculty and department meetings. | 4.38 | 0.71 | 5 | 24 |
| I use our schoolwide language of instruction during PLC meetings. | 4.43 | 0.75 | 5 | 21 |
| I use our schoolwide language of instruction in informal conversations. | 4.22 | 0.74 | 4 | 23 |

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

Table 3 indicates that teachers' and staff members' mean item responses for leading indicator 2.1 ranged from 4.22 to 4.50. The overall mean was 4.39 (0.10).

**Leading Indicator 2.2: Support is provided to teachers to continually enhance their pedagogical skills through reflection and professional growth plans.**

Tables 4 and 5 list the descriptive statistics for leading indicator 2.2.

**Table 4: Descriptive Statistics for Leading Indicator 2.2 (Administrator)**

| Survey Item | *M* | *SD* | *Mode* | *n* |
|---|---|---|---|---|
| Teachers have written statements of their instructional growth goals. | 5.00 | | | 1 |
| Teachers keep track of their progress on their instructional growth goals. | 5.00 | | | 1 |
| I meet with teachers to discuss their instructional growth goals. | 4.00 | | | 1 |
| Teachers can describe their progress on their instructional growth goals. | 4.00 | | | 1 |
| I hire effective teachers. | 5.00 | | | 1 |
| There is a system in place to evaluate the hiring and selection process for new teachers. | 4.00 | | | 1 |
| Our school has a new-teacher induction program. | 5.00 | | | 1 |
| There is a system in place to evaluate and revise our new-teacher induction program. | 4.00 | | | 1 |
| I retain effective teachers. | 5.00 | | | 1 |
| I can provide evaluation results, growth plans, and evidence of support for any struggling teachers. | 4.00 | | | 1 |

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

Table 4 indicates that the administrator's item responses for leading indicator 2.2 ranged from 4.00 to 5.00. The overall mean was 4.50 (0.53).

**Table 5: Descriptive Statistics for Leading Indicator 2.2 (Teacher/Staff)**

| Survey Item | *M* | *SD* | *Mode* | *n* |
|---|---|---|---|---|
| I have written statements of my instructional growth goals. | 4.46 | 0.59 | 5 | 24 |
| I keep track of my progress on my instructional growth goals. | 4.13 | 0.61 | 4 | 24 |
| School leaders meet with me to discuss my instructional growth goals. | 4.08 | 0.81 | 4 | 25 |
| I can describe my progress on my instructional growth goals. | 4.17 | 0.56 | 4 | 24 |
| School leaders hire effective teachers. | 4.36 | 0.70 | 5 | 25 |
| School leaders have a system in place to evaluate the hiring and selection process for new teachers. | 4.17 | 0.72 | 4 | 23 |
| Our school has a new-teacher induction program. | 3.57 | 1.03 | 4 | 21 |
| School leaders have a system in place to evaluate and revise our new-teacher induction program. | 3.78 | 1.00 | 4 | 18 |
| School leaders retain effective teachers. | 4.35 | 0.75 | 4,5 | 26 |
| School leaders can provide evaluation results, growth plans, and evidence of support for any struggling teachers. | 3.90 | 0.91 | 4 | 20 |

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

Table 5 indicates that teachers' and staff members' mean item responses for leading indicator 2.2 ranged from 3.57 to 4.46. The overall mean was 4.10 (0.28).

**Leading Indicator 2.3: Predominant instructional practices throughout the school are known and monitored.**

Tables 6 and 7 list the descriptive statistics for leading indicator 2.3.

**Table 6: Descriptive Statistics for Leading Indicator 2.3 (Administrator)**

| Survey Item | *M* | *SD* | *Mode* | *n* |
|---|---|---|---|---|
| Data from walkthroughs at our school are aggregated to show our school's predominant instructional practices. | 3.00 | | | 1 |
| I can describe our school's predominant instructional practices. | 4.00 | | | 1 |
| Teachers can describe our school's predominant instructional practices. | 4.00 | | | 1 |
| I give teachers forthright feedback about their instructional practices. | 4.00 | | | 1 |
| I can describe effective practices and problems of practice in our school. | 4.00 | | | 1 |

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

Table 6 indicates that the administrator's item responses for leading indicator 2.3 ranged from 3.00 to 4.00. The overall mean was 3.80 (0.45).

**Table 7: Descriptive Statistics for Leading Indicator 2.3 (Teacher/Staff)**

| Survey Item | *M* | *SD* | *Mode* | *n* |
|---|---|---|---|---|
| Data from walkthroughs at our school are aggregated to show our school's predominant instructional practices. | 3.91 | 0.75 | 4 | 22 |
| School leaders can describe our school's predominant instructional practices. | 4.45 | 0.60 | 5 | 22 |
| I can describe our school's predominant instructional practices. | 4.17 | 0.92 | 4 | 24 |
| School leaders give me forthright feedback about my instructional practices. | 3.96 | 0.82 | 4 | 23 |
| School leaders can describe effective practices and problems of practice in our school. | 4.30 | 0.70 | 4 | 23 |

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

Table 7 indicates that teachers' and staff members' mean item responses for leading indicator 2.3 ranged from 3.91 to 4.45. The overall mean was 4.16 (0.23).

**Leading Indicator 2.4: Teachers are provided with clear, ongoing evaluations of their pedagogical strengths and weaknesses that are based on multiple sources of data and are consistent with student achievement data.**

Tables 8 and 9 list the descriptive statistics for leading indicator 2.4.

**Table 8: Descriptive Statistics for Leading Indicator 2.4 (Administrator)**

| Survey Item | *M* | *SD* | *Mode* | *n* |
|---|---|---|---|---|
| I use highly specific rubrics to give teachers accurate feedback about their pedagogical strengths and weaknesses. | 4.00 | | | 1 |
| I use multiple sources of information to give teachers feedback and evaluate them, including direct observation, teacher self-reports, video analysis, student reports, and peer feedback from other teachers. | 3.00 | | | 1 |
| I regularly talk to teachers about the evaluation data I have collected for them. | 4.00 | | | 1 |
| I observe teachers frequently. | 4.00 | | | 1 |
| I give teachers feedback frequently. | 4.00 | | | 1 |
| Teachers can explain which of their instructional strategies have the strongest and weakest relationships to student achievement. | 3.00 | | | 1 |

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

Table 8 indicates that the administrator's item responses for leading indicator 2.4 ranged from 3.00 to 4.00. The overall mean was 3.67 (0.52).

**Table 9: Descriptive Statistics for Leading Indicator 2.4 (Teacher/Staff)**

| Survey Item | *M* | *SD* | *Mode* | *n* |
|---|---|---|---|---|
| School leaders use highly specific rubrics to give me accurate feedback on my pedagogical strengths and weaknesses. | 3.91 | 0.92 | 4 | 22 |
| School leaders use multiple sources of information to give me feedback and evaluate me including, direct observation, teacher self-reports, video analysis, student reports, and peer feedback from other teachers. | 3.70 | 1.02 | 4 | 23 |
| School leaders regularly talk to me about the evaluation data they have collected for me. | 3.36 | 1.14 | 4 | 22 |
| School leaders observe me frequently. | 3.83 | 0.92 | 4 | 24 |
| School leaders give me feedback frequently. | 3.75 | 1.11 | 4 | 24 |
| I can explain which of my instructional strategies that have the strongest and weakest relationships to student achievement. | 3.91 | 0.90 | 4 | 23 |

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

Table 9 indicates that teachers' and staff members' mean item responses for leading indicator 2.4 ranged from 3.36 to 3.91. The overall mean was 3.74 (0.21).

**Leading Indicator 2.5: Teachers are provided with job-embedded professional development that is directly related to their instructional growth goals.**

Tables 10 and 11 list the descriptive statistics for leading indicator 2.5.

**Table 10: Descriptive Statistics for Leading Indicator 2.5 (Administrator)**

| Survey Item | *M* | *SD* | *Mode* | *n* |
|---|---|---|---|---|
| Online professional development courses and resources that are relevant to teachers' instructional growth goals are available to them. | 5.00 | | | 1 |
| Teacher-led professional development relevant to teachers' instructional growth goals is available to them. | 5.00 | | | 1 |
| Instructional coaching relevant to teachers' instructional growth goals is available to them. | 4.00 | | | 1 |
| I collect data about how effective professional development is in improving teacher practices. | 3.00 | | | 1 |
| Teachers can describe how the available professional development supports achievement of their instructional growth goals. | 4.00 | | | 1 |

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

Table 10 indicates that the administrator's item responses for leading indicator 2.5 ranged from 3.00 to 5.00. The overall mean was 4.20 (0.84).

**Table 11: Descriptive Statistics for Leading Indicator 2.5 (Teacher/Staff)**

| Survey Item | *M* | *SD* | *Mode* | *n* |
|---|---|---|---|---|
| Online professional development courses and resources that are relevant to my instructional growth goals are available to me. | 4.54 | 0.59 | 5 | 24 |
| Teacher-led professional development that is relevant to my instructional growth goals is available to me. | 4.33 | 0.70 | 5 | 24 |
| Instructional coaching relevant to my instructional growth goals is available to me. | 4.25 | 0.85 | 5 | 24 |
| School leaders collect data about how effective professional development is in improving teacher practices. | 4.05 | 0.83 | 4 | 20 |
| I can describe how the available professional development supports achievement of my instructional growth goals. | 4.33 | 0.56 | 4 | 24 |

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

Table 11 indicates that teachers' and staff members' mean item responses for leading indicator 2.5 ranged from 4.05 to 4.54. The overall mean was 4.30 (0.18).

**Leading Indicator 2.6: Teachers have opportunities to observe and discuss effective teaching.**

Tables 12 and 13 list the descriptive statistics for leading indicator 2.6.

**Table 12: Descriptive Statistics for Leading Indicator 2.6 (Administrator)**

| Survey Item | *M* | *SD* | *Mode* | *n* |
|---|---|---|---|---|
| Teachers have opportunities to engage in instructional rounds. | 3.00 | | | 1 |
| Teachers have opportunities to view and discuss video examples of effective teaching. | 4.00 | | | 1 |
| Teachers have regular times to meet with other teachers to discuss effective instructional practices (for example, lesson study). | 4.00 | | | 1 |
| Teachers have opportunities to interact about effective teaching via technology (for example, virtual coaching or online discussions). | 4.00 | | | 1 |
| We regularly discuss instructional practices at faculty and department meetings. | 4.00 | | | 1 |
| We regularly view and discuss video examples of effective teaching at faculty and department meetings. | 3.00 | | | 1 |
| I make information available about teachers' participation in opportunities to observe and discuss effective teaching. | 4.00 | | | 1 |
| I make information available about teachers' participation in virtual discussions about effective teaching. | 3.00 | | | 1 |

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

Table 12 indicates that the administrator's item responses for leading indicator 2.6 ranged from 3.00 to 4.00. The overall mean was 3.63 (0.52).

**Table 13: Descriptive Statistics for Leading Indicator 2.6 (Teacher/Staff)**

| Survey Item | *M* | *SD* | *Mode* | *n* |
|---|---|---|---|---|
| I have opportunities to engage in instructional rounds. | 4.22 | 0.80 | 4 | 23 |
| I have opportunities to view and discuss video examples of effective teaching. | 3.67 | 1.13 | 4 | 24 |
| I have regular times to meet with other teachers to discuss effective instructional practices (for example, lesson study). | 3.83 | 0.96 | 4 | 24 |
| I have opportunities to interact about effective teaching via technology (for example, virtual coaching or online discussions). | 3.75 | 0.90 | 4 | 24 |
| We regularly discuss instructional practices at faculty and department meetings. | 3.96 | 0.91 | 4 | 24 |
| We regularly view and discuss video examples of effective teaching at faculty and department meetings. | 2.87 | 1.06 | 2 | 23 |
| School leaders have information available about teachers' participation in opportunities to observe and discuss effective teaching. | 3.84 | 0.90 | 4 | 19 |
| School leaders have information available about teachers' participation in virtual discussions about effective teaching. | 3.78 | 1.06 | 4 | 18 |

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

Table 13 indicates that teachers' and staff members' mean item responses for leading indicator 2.6 ranged from 2.87 to 4.22. The overall mean was 3.74 (0.39).

# Summary and Discussion

Administrative staff, teachers, and other stakeholders at Crosslake Community School responded to an online survey designed to gauge their school's status on the second 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 14 summarizes the overall means for each leading indicator (means and standard deviations were calculated from the reported survey-item means).

**Table 14: Overall Means for Level 2 Leading Indicators**

| Leading Indicator | Administrator | | Teacher/Staff | |
|---|---|---|---|---|
| | *M* | *SD* | *M* | *SD* |
| 2.1: The school leader communicates a clear vision as to how instruction should be addressed in the school. | 4.88 | 0.35 | 4.39 | 0.10 |
| 2.2 Teachers are provided support to continually enhance their pedagogical skills through reflection and professional growth plans. | 4.50 | 0.53 | 4.10 | 0.28 |
| 2.3: Predominant instructional practices throughout the school are known and monitored. | 3.80 | 0.45 | 4.16 | 0.23 |
| 2.4: Teachers are provided with clear, ongoing evaluations of their pedagogical strengths and weaknesses that are based on multiple sources of data and are consistent with student achievement data. | 3.67 | 0.52 | 3.74 | 0.21 |
| 2.5: Teachers are provided with job-embedded professional development that is directly related to their instructional growth goals. | 4.20 | 0.84 | 4.30 | 0.18 |
| 2.6: Our teachers have opportunities to observe and discuss effective teaching. | 3.63 | 0.52 | 3.74 | 0.39 |

*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 14 indicates that the administrator's overall means ranged from 3.63 to 4.88. Teachers' and staff members' overall means ranged from 3.74 to 4.39.

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:

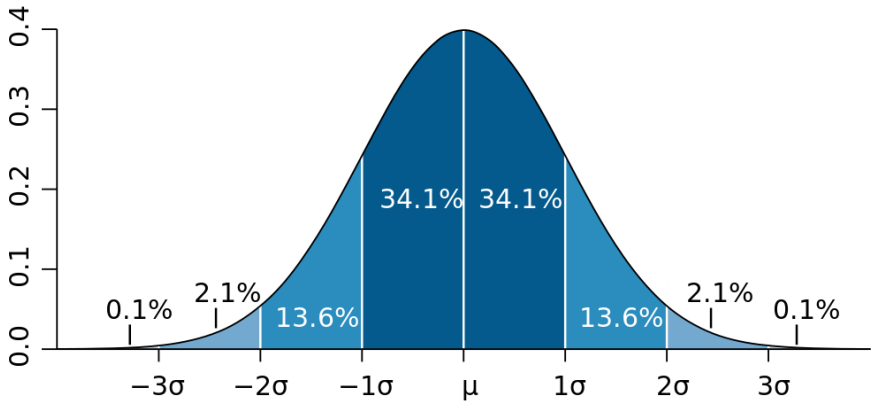
$$s^2 = \frac{(X_1 - M)^2 + (X_2 - M)^2 + \cdots + (X_n - M)^2}{n - 1}$$

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

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

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.

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