

SANDIA REPORT

SAND 2005-2081
Unlimited Release
Printed April 2005

LEADERSHIP DEVELOPMENT STUDY

Success Profile Competencies and High-Performing Leaders at Sandia National Laboratories

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National Nuclear Security Administration under Contract DE-AC04-94AL85000.

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Abstract

Sandia is undergoing tremendous change. Sandia's executive management recognized the need for leadership development. About ten years ago the Business, Leadership, and Management Development department in partnership with executive management developed and implemented the organizational leadership Success Profile Competencies to help address some of the changes on the horizon such as workforce losses and lack of a skill set in the area of interpersonal skills.

This study addresses the need for the Business, Leadership, and Management Development department to provide statistically sound data in two areas. One is to demonstrate that the organizational 360-degree success profile assessment tool has made a difference for leaders. A second area is to demonstrate the presence of high performing leaders at the Labs. The study utilized two tools to address these two areas. Study participants were made up of individuals who have solid data on Sandia's 360-degree success profile assessment tool. The second assessment tool was comprised of those leaders who participated in the Lockheed Martin Corporation Employee Preferences Survey. Statistical data supports the connection between leader indicators and the 360-degree assessment tool. The study also indicates the presence of high performing leaders at Sandia.

KEY WORDS: Success profile; 360-degree; 360-degree assessment; Leadership

EXECUTIVE SUMMARY

About ten years ago Sandia National Laboratories recognized the need to formalize its leadership development. The focus changed to a leader skill set that incorporated the capability to work and interact with people as well as having technical expertise. This report explores what Sandia did in response to the need for change.

Study Framework

As Sandia continues to change, it becomes essential for leaders to understand how to measure themselves against organizational goals. Use of a 360-degree assessment tool with an associated individualized development plan can facilitate this understanding. Working with executive management, the Business, Leadership, and Management Development (BLMD) department designed and implemented a 360-degree success profile assessment tool based on the leadership competencies. The study framework includes discussion on the Success Profile Competency set that Sandia utilizes as one leadership development tool. Sandia defines leadership through four categories and fifteen competencies. The first category is Mission Success, defined as the ability to deliver consistent results by focusing on the customer and understanding the organization and business aspects of its programs. The five related competencies under this category are Business Acumen, Results, Customer Focus, Strategic Perspective, and Innovation. The second category is Leadership, defined as the ability to positively influence the attitudes and behaviors of others toward successful accomplishment of organizational needs. The four related competencies under this category are Dealing with Change, Taking Responsibility, Decision Making, and Developing Self and Others. The third category is Interpersonal Skills, defined as those individual attributes that engender the trust, commitment, and the followership of others. The four related competencies are Building Relationships, Collaboration and Teamwork, Diversity and Inclusion, and Communication. The fourth category is Core and is defined as those fundamental building blocks that define who we are as an organization and what the organization values. The two related competencies are Sandia Values and Professional/Technical Expertise. Because the Professional/Technical Expertise was not in place before a 2002 competency re-assessment and therefore did not provide enough data, it was not included in this study.

The existence of high performing leaders at Sandia is explored in this study. Data used to confirm this were derived from the leader's direct manager, peers, staff, and customers. The importance of tying results of a 360-degree assessment to recognition of notable strengths is highlighted. Taking the 360-degree assessment report and understanding how to put together an action plan based on developing and enhancing strengths in a few focused competencies is brought out as essential to organizational success.

Sandia recognizes that the Success Profile Competencies are one indicator of leadership. The existence of other possible leadership indicators at Sandia is explored. The conclusion is that the only other existing documentation of potential leader indicators at Sandia are in the *Manager Quality Index* responses from the 2003 Lockheed Martin (LMC) Employee Preferences Survey. To verify and gain concurrence on how important the LMC survey

leader indicators are at Sandia, the Sandia Education Committee (SEC) identified three important leader indicators. The SEC identified leadership, defined as having a vision that inspires other individuals to work, as being most important. The need for leaders to be committed to their people's professional development was also identified as important. The third important leader indicator identified by the SEC was organization, defined as the ability to get work done by providing the necessary balance of direction and resources.

Study Participants

Participants in the study were individuals who have participated in the 360-degree success profile assessment tool. In addition, those who also have taken the LMC Employee Preference survey are included. Through data verification, it was determined that 1370 individuals with 360-degree assessment data and 172 with an LMC survey qualified for the study.

Study Hypotheses Results and Discussion

Two hypotheses with three related questions each were explored. The first used a null hypothesis to explore whether there was a significant difference between the 360-degree success profile assessment tool and organizational leader indicators using the LMC employee preference survey. Related research questions to the first hypothesis focused on comparing initial and final scores for those leaders who have taken the 360-degree and the LMC survey tools.

Hypothesis 1, the null hypothesis, was proved to be false. The data reflect that there is a relationship between the 360-degree Success Profile Competencies and the leader indicators from the LMC employee preference survey. Comparing the initial-to-final scores for leaders with the 360-degree assessment tool, the data show that there are two competencies that had a statistical significance at the $p=0.05$ level. A "p" score of $<.05$ reflects that 95 out of 100 times the results would be the same. Statistically, Business Acumen and Sandia Values, both at the 0.02 level, are consistent with the need to change the organizational culture to account for business costs while working to maintain integrity, excellence, and service to the nation.

Another question under the first hypothesis explored whether there was a difference in the initial-to-final scores for those leaders who completed an LMC survey. The initial score reflects the first time an individual completed the 360-degree assessment. Final scores represent the score from taking the assessment at least one year or more after the initial assessment. Four competencies had statistical significance at the $p=0.05$ level. The competencies are Sandia Values at 0.00, Diversity and Inclusion at 0.02, Dealing with Change at 0.03, and Developing Self and Others at $p=0.04$. These results directly support the three important leader indicators identified by the SEC.

A third research question related to Hypothesis 1 explored whether there was a difference in the LMC survey results for those leaders who have taken the 360-degree assessment tool. Data analysis determined that there was not a statistical connection between the 360-degree success profile assessment and LMC survey results on employee retention, employee engagement, and commitment. The lack of statistical impact is not a surprise as,

at this point, these two tools are the only ones currently identified and in use at Sandia. Both tools have been used separately. A future study consideration is to ascertain organizational leader indicators.

The second hypothesis focused on whether the 360-degree success profile assessment tool demonstrated the presence of high performing leaders at Sandia. Related research questions focused on assessing the number of Sandia leaders with assessment scores at or above the 90th percentile as well as statistically ascertaining relationships, or companion competencies, between competencies that individuals can use to maximize a move from being a good leader to becoming an extraordinary leader. Companion competencies are defined as those competencies that are tightly connected with each other. They can enable leaders to get the “most bang for their buck” in terms of where to focus their action plan.

The statistical analysis proved Hypothesis 2 to be true. The presence of high performing leaders is demonstrated at Sandia. Zenger & Folkman (2002) have defined individuals scoring at or above the 90th percentile on three or more competencies as high performing leaders. Their research states that the presence of high performing leaders directly links to organizational effectiveness by keeping and retaining staff, having a strong strategic focus, a clear vision, better communication, and delivery of results.

A study research question explored how many leaders were at or above the 90th percentile score on the Success Profile Competencies. The data reflect that there are 199 individuals who scored at or above the 90th percentile on three or more competencies. It is important to note that the statistical data reflect two individuals who scored at or above the 90th percentile in all 14 competencies in the study with another two scoring at this level on 13 competencies. There were 47 individuals who scored at this level on at least 50% of the competencies. There were 67 individuals who scored at or above the 90th percentile on three competencies.

Two competencies initially identified as a gap continue to reflect concern for the organization. It is important to note that Business Acumen was statistically significant when assessing the initial-to-final scores on the 360-degree assessment tool. However, this competency had the second to lowest number of individuals scoring at or above the 90th percentile level. Dealing with Change had 28 individuals scoring at the 90th percentile or above. There is some concern about this low number due to these competencies being identified as essential leadership skills for future organizational success.

A second research question related to Hypothesis 2 assessed whether there was a relationship between competencies reflecting companion competencies. Companion competencies are important as they can be utilized to put together an effective and efficient individualized development plan. They can also help leaders get the most “bang for the buck” by identifying work on one competency that enables them to result in improvement in a closely related competency. The statistical analysis determined that there was at least one tightly connected companion competency for each. Collaboration and Teamwork had strong correlations with all other competencies. The other competencies, excluding Sandia

Values, ranged from 4 to 13 companion competencies. Sandia Values has one correlation with Collaboration and Teamwork as its companion competency.

A third question related to Hypothesis 2 compared statistical results for two of the success profile categories. This was explored because research highlights that leaders with strong skills in both achieving organizational results and interpersonal skills are perceived as being an extraordinary leader 66% more often than ones who are strong in one or the other. The two categories are Mission Success and Interpersonal Skills. Analysis highlighted that there is a strong correlation between these two categories. Those leaders who scored at or above the 90th percentile in Mission Success also tended to score in that range on the Interpersonal Skills category.

Future Study Recommendations

Several potential future studies came out of this study. This study highlighted the existence of limited documentation for leader indicators at Sandia. Further work needs to be done to ascertain those leader indicators that logically fit with future organizational needs.

This study highlighted limited documentation on employee retention, engagement, and commitment in relation to the 360-degree success profile assessment too. It would be interesting to conduct an analysis of those leaders who scored at or above the 90th percentile and then compare them for potential relationships to organizational effectiveness as evidenced by keeping and retaining staff, having a strong strategic focus, better communication, a clear future vision, and effective delivery of organizational results.

This study focused on 14 of the 15 Success Profile Competency sets. The Professional/Technical Expertise competency was excluded because it lacked enough statistical data because it only came into existence in 2002. Future study consideration would be to conduct this study again once data exist on this fifteenth Success Profile Competency.

Another good question for further investigation would be to ascertain whether a statistical significance exists between those competencies that leaders choose to include on their action plans and the overall initial-to-final results for the Success Profile Competencies.

Business Acumen is considered an important organizational competency as evidenced by the statistically significant difference on the initial-to-final scores on the success profile assessment tool. A future study consideration would be to explore why this competency had only 52 individuals at or above the 90th percentile score range.

Summary

In summary, continuing to focus on building the interpersonal skill set as well as the technical skills is essential for organizational success. Sandia has made significant progress in developing its leaders. Continued executive management support, both visible and verbal, for the Success Profile Competency set can enhance organizational success by effectively accomplishing needed results through its people.

Implementation of the Success Profile Competency set has made a difference for the organization. Assessment of statistical data reflects that there has been an overall improvement, from initial-to-final scores, on four competencies originally identified by executive management as critical success factors. Scores for Developing Self and Others, Dealing with Change, Sandia Values, and Diversity and Inclusion have significantly improved from ten years ago. Recognizing that the data are input based on a 360-degree set of respondents further validates the study results. The leader receives input from their next level manager, their peer group, their employees, and customer set.

Two competencies originally identified as critical continue to be of concern. Business Acumen was recognized as being statistically significant. However, this competency had the second lowest number of extraordinary leaders as defined by those scoring at or above the 90th percentile level. Dealing with Change, another identified critical competency, was not recognized as statistically significant. It also had the lowest number of leaders scoring at the extraordinary level. For both of these competencies, the concern relates the continued need for these essential leadership skills for future organizational success.

As the organization continues to change and move forward, it becomes even more essential that leadership development tools connect with each other in a meaningful way. The BLMD department now has statistical data recognizing the presence of high performing leaders at Sandia. Data also now reflect the connection between the organizational 360-degree success profile assessment tool and leader indicators. A next step for BLMD is to work with leaders around Sandia to identify more tightly connected leader indicators.

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INTRODUCTION

Why Sandia National Laboratories Wanted to Change

Today's business world is undergoing tremendous change. One organization experiencing multiple major changes is Sandia National Laboratories, a large research and development laboratory and a contractor to the government. Sandia is a national security laboratory operated for the U.S. Department of Energy by Sandia Corporation. Its main mission is the design of all non-nuclear components for the nation's nuclear weapons program. Sandia also performs a wide variety of national security endeavors including energy research and development projects—both military and economic.

Sandia's executive management recognized the potential for a major organizational re-focus because of the need for leaders to be skilled in both the technical and interpersonal aspects of their job. These executives recognized the need to initiate a change from the old way of recognizing, through promotions to management, only technical expertise to also recognizing the person's capability to work with people.

Since 1990, according to the Sandia National Laboratories (Jan. 2004) Strategic Education Committee (Jan. 2004), Sandia has been experiencing: (1) a pendulum swing from a philosophy of "do what it takes to figure out the solution to a problem" to "safety is number one" in importance (this safety concern has occasionally almost shut the company down); (2) from being run for the government by a company with a people focus to being run by a company with a cost-cutting focus; (3) from working with a company known for its ethics to working with a company having multiple ethics violations; (4) from costs running on overhead and doing what it takes to solve problems of national importance to one of charging costs for every second of time; and (5) from a basic job classification system without any tie to compensation system to a job classification with links to pay.

A Sandia-wide survey finding highlighted the need to develop critical skill sets in both technical and people aspects of the job, a change from focusing promotions solely on technical expertise. The survey identified several gaps, including communication, decision-making, dealing with ambiguity, business savvy, and managing diversity.

Additionally, a special management team study identified management weaknesses. The team stated that a systemic cause for these weaknesses is that the organization is not making informed, mindful decisions in its leadership selection.

What Sandia National Laboratories Did

About ten years ago executive management brought in the concept of leadership competencies to help address workforce losses and lack of a critical skill set in the interpersonal area. An external consultant group was brought in to work with the executive management team to identify and prioritize competencies most important to the organization. The Business, Leadership, and Management Development (BLMD) department was then asked to identify a vendor company with a 360-degree assessment focus that could assist leaders and future leaders in gaining the necessary critical skill sets.

To help individuals and management teams focus their development, the BLMD department worked to incorporate both factors, with related gaps, into the organizational competency set based on three skill areas cited in Figure 1: interpersonal, professional/technical, and organizational.



Figure 1. How the Success Profile Competency Set Fits Within Organizational Needs

Professional/technical expertise has been the primary driver for promotions at Sandia. A more recent driver has arisen out of the need to address people or interpersonal skills. This need is being driven based on recognition for increased capability in the interpersonal aspect of a leader's job due to the need to keep and retain a world-class workforce. Recognition that a leader needs to be skilled in understanding what has top priority for the organizational is the third driver for leadership development.

Sandia executive management supported the design and development of a 360-degree assessment tool to meet organizational needs through the development of its leaders. To assist individuals and groups to develop in each of the categories and competencies within the assessment tool, the BLMD department offered skills and knowledge classes. The target audience for this program initially was any individual considering a formal leadership role. As the program was refined, the target audience extended to intact management work groups and coaching opportunities addressing attitude changes.

Business Need for This Study

The business need for this study is twofold. First, the BLMD department has been asked to provide statistically sound data in support of the Success Profile Competency set making a difference at Sandia. As part of providing statistical data, BLMD found that it lacks the data tying the organizational 360-degree success profile data to Sandia leader indicators. Secondly, after approximately ten years, a study to assess whether Sandia can demonstrate the presence of high performing leaders is needed.

Definitions

360-Degree Success Profile Assessment Tool. An assessment utilized by Sandia to assist leaders in determining how they are doing in comparison to what the organization sees as important for success. A competency skill set utilized by Sandia that leaders can use to take ownership of one's professional development.

Competency. A narrowly defined set of knowledge, skills, and attitudes that enables an individual or group to initiate, sustain, control, and support the type of actions that generate on-the-job results. Developing a well-formulated set of competencies supports successful selection, evaluation, development, and reward systems for current and future leaders.

High Performing Leader. An individual having one or more notable strengths that set him or her apart from others. Those leaders with at least three competencies at or above the 90th percentile level as defined by Zenger & Folkman (2002).

Lead. Devising ways to break the mediocrity barriers and achieve a high level of performance in day-to-day work.

Leadership. A skill set focused on accomplishing mission success through people. Made up of 15 competencies under four categories. Includes the areas of leadership, development of their people, and accomplishment of organizational results through providing the necessary balance of direction and resources. For the purposes of this study, the term "manager" is synonymous with "leader".

Leadership Indicators. Identification of those indicators that is important to the organization. Based on the Lockheed Martin Corporation (LMC) Employee Preference Survey results.

STUDY FRAMEWORK

Utilizing Success Profile Competencies and demonstrating the presence of high performing leaders can assist Sandia's movement toward the placing of skilled leaders in both the interpersonal, organizational, and professional/technical aspects of the job. Gaining an understanding of how a Success Profile Competency set can assist individuals and groups to focus on key organizational needs is essential. Understanding the relationship between a competency set and being a high performing leader is a more recent organizational concept that will help Sandia National Laboratories to maximize and maintain its world-class workforce.

Success Profile Competency Set

In today's world, leaders need to be technically skilled as well as skilled in the interpersonal aspects of working with their employees to get the work done. Kouzes & Posner (1997) recognize that the contributions leaders provide are to develop their people and to help their organization grow. They support the use of a 360-degree tool to assess whether a leader is exhibiting the necessary capabilities essential for organizational success.

Sandia recognizes that the use of the Success Profile Competency tool is an effective method to take ownership of one's professional development. Utilizing the data to help establish oneself in the business world, the person would take action that could generate positive consequences. There are potential organizational payoffs for an individual paying attention to the importance of developing interpersonal skills in career development. The payoff can be in having a reduction in stress, diminishing the workload, getting a better position, gaining more recognition, building better relationships, or having a better chance at a higher financial payoff or a deeper sense of satisfaction at work, all powerful incentives to making a behavioral change.

Sandia's process includes using the Success Profile Competency tool to assist both individuals and their leaders in meeting organizational needs. Sandia expects that the individual will be responsible for completing the 360-degree assessment tool, followed by completion of an action plan around what is most important to the organization and what supports professional development. Included in the leader responsibilities are succession planning, a work environment that supports getting the work while developing its people, and having what is important to the organization on the performance management form. The organization is responsible for making sure that the Success Profile Competency set addresses what is needed to get the organization to where it needs to be in the next three to five years.

How the Success Profile Competency Tool Is Applied: Feedback and Action Plan

For leaders to know what to work on, they must receive performance feedback and then choose how to apply the essential aspects of the data into an action plan. This enables the leader to “measure performance and results against a goal” (Drucker, 1974, p. 440). The 360-degree feedback also facilitates the setting of strategic objectives for the leader. Strategic objectives should be based on those of the organization and reviewed by people who will be affected by them, including those employees that report directly to them, their peers, and their direct manager. Assessing and leading by strategic objectives can assist the leader in focusing his/her action plan on what is important to the organization.

Feedback can enhance communication through the use of a 360-degree process. Drucker’s work (2004) continues to support the need to understand what makes for an effective leader. Two practices stand out as providing the necessary knowledge: understanding what needs to be done and understanding what is best for the organization. This process begins with a leader requesting feedback. The next step is for respondents to complete a feedback assessment. Third is for the leader to attend a session where he/she reviews and analyzes the feedback. The fourth step in the feedback process is for the leader to go back to his/her employees and discuss what was discovered and the associated action plan to be implemented. This circular feedback process is very effective in enhancing all-around communication.

Focusing on developing our leaders is done through recognizing how leaders can accomplish their work through their people. Sandia recognizes that change is normal and all pervasive, and that the direction of change can be affected by how a human responds to it. Acknowledging the human response, the 2004 work conducted by the Center for Creative Leadership on leadership reinforces the need to understand how feedback can make a difference. Goldsmith (1996, p. 232) states “Leaders who ask, process information, and learn in a highly efficient manner will have tremendous competitive advantage over their slower and less proactive competition.”

Recognition that people respond differently to feedback can also be helpful to leaders. This recognition can bring about better understanding that enhances the probability of behavior change.

A last step in the feedback process is to use pertinent feedback to develop and implement an action plan. This is done to help the individual make a decision on which of the components needs to be addressed in an action plan. Folkman (1996, p. 59) recommends asking introspective questions:

- How do others reward the current behavior in the organization?
- Who encourages or discourages the behavior and why?
- What good occurs with the behavior?
- What problems occur with the behavior?
- What in the organizational structure supports the behavior?
- Are there any systems in the organization that support the behavior?

After analyzing the feedback data and asking the introspective questions, the leader can ascertain if his/her action plan focuses on what is most important for the organization while enhancing professional development. After developing an action plan, the leader is expected to share the plan with the immediate manager. To enhance the communication process between a leader and the direct reports, it is expected that the action plan will be shared for a clear understanding of how each individual fits.

High Performing Leaders

Zenger & Folkman's 2002 research highlights the need to approach leadership development in a new and innovative way. Their research further supports the need for feedback. The research shows that feedback can highlight strong negative results within a category or competency that could derail individual or organizational effectiveness.

Sandia has begun to recognize the value of becoming very competent in a focused few areas rather than trying to be good at many. Zenger & Folkman (2002, pp. 2,3) supports this: "The data shows that leaders who have one or more notable strengths are far more valuable to their organizations than those who have neither glaring weaknesses nor outstanding strengths...the time you spend developing yourself will be best spent on improving your skills in areas where you are already strong."

Similar to other organizational consultants Zenger & Folkman (2002) recommend the use of a 360-degree assessment tool. The difference is that rather than focusing on strengths *and* weaknesses, individuals focus on how to develop and enhance their strengths. Their research brings out that having an emphasis on being very competent in one or two areas can move a leader from good to great performance.

Connecting one competency to another through the use of companion competencies is a major aspect of the research. Zenger & Folkman (2002) bring out the concept of nonlinear development, that is, the concept that a competency can be strengthened in ways that may not be obvious. Their belief is that certain behaviors, called companion competencies, exhibited within one competency will affect the outcome of another competency. Companion competencies are tightly connected with one another and build upon each other. They provide clues for an individual on how to put together an action plan that enables the "most bang for the buck." Understanding the implication of an individual applying behaviors and skills from one competency to another enables the person or group to recognize how to maximize their effectiveness. It is the use of companion competencies, according to Zenger & Folkman, that can be the key for a leader to move from being good to becoming extraordinary.

Another consideration is understanding how leaders with at least three competency scores at or above the 90th percentile support the presence of characteristics of a high performing leader. Zenger & Folkman's (2002) research states that the presence of a high performing leader directly links to organizational effectiveness as evidenced by keeping and retaining staff, having a strong strategic focus and clear vision, better communication, and delivery of results.

STUDY METHODOLOGY

This study provides a comparison of leader indicators at Sandia National Laboratories to existing 360-degree Success Profile Competency data. The study utilizes the Sandia 360-degree Success Profile Competency assessment tool and the LMC employee preference survey tool. Both reflect perceptions of others about their leader. The report does not address potential Sandia leader indicators outside those identified in the study.

There are two aspects to the study. The first is a comparison of data for those leaders at Sandia who have taken both the Success Profile Competency assessment and participated in the LMC employee preference survey.

Included within the first aspect is a comparison analysis of the initial and final scores for those who have taken the 360-degree success profile assessment tool. Also included is an analysis of whether the latest LMC survey leader indicator scores for all managers and any manager who has taken the 360-degree success profile assessment tool indicates a difference. The last piece of the first aspect is to ascertain whether the LMC survey data reflect a difference in employee retention, employee engagement, and employee commitment for those leaders who have taken the 360-degree success profile assessment.

The second aspect focuses on demonstrating the presence of high performing leaders at Sandia based on Zenger & Folkman's (2002) concept that leaders with at least three competency scores at or above 90% support the presence of high performance. Included in this aspect is ascertaining the number of leaders at or above the 90th percentile at the competency level. Determining if there is a relationship between competencies is another consideration. Comparing overall results between the Mission Success and Interpersonal Skills categories is the final piece of the second aspect.

Success Profile Competencies

Sandia has had Success Profile Competencies in place since the early 1990s. In response to changing organizational needs, there have been three revisions to the competency set, the latest being in 2002. Sandia defines its leaders as being made up of the compilation of fifteen competencies under four categories.

Sandia defines leadership through four main categories. The four categories complement organizational needs for skills in the area of interpersonal, professional/technical, and organizational knowledge. These four categories are further defined by specific leadership competencies as listed in Table 1. The Mission Success category is defined as the ability to deliver consistent results by focusing on the customer and understanding the organization and business aspects of the business programs. The five related competencies under this category are Results, Strategic Perspective, Innovation, Business Acumen, and Customer Focus. Results brings together the concepts of being able to exceed goals successfully;

constantly and consistently being a top performer, being very action-oriented, and steadfastly pushing self and others. Strategic Perspective focuses on seeing the implications of global political, technological, and economic trends for setting strategic direction. Innovation brings together the ideas of creating new or significantly different and useful ideas and methods, processes, products, or services to achieve Sandia objectives. The fourth competency, Business Acumen, highlights knowing how the business works and being knowledgeable in current and possible future policies practices, trends, and information affecting the leader’s business and the organization. Customer Focus, the last competency under this category, is dedicated to meeting the expectations and requirements of internal and external customers, getting first-hand customer information and using it for service improvements, and acting with customers in mind.

Table 1. Success Profile Category and Competency Set

Category and Definition	Related Competencies	
Mission Success	Business Acumen	Customer Focus
	Results	Strategic Perspective
	Innovation	
The ability to deliver consistently outstanding results by focusing on the customer, understanding the organization and business aspects of the programs		
Leadership	Dealing with Change	Decision Making
	Taking Responsibility	Developing Self and Others
Having the skills and courage to step up, make a difference, and build the organizational capability for the future		
Interpersonal Skills	Building Relationships	Diversity and Inclusion
	Collaboration and Teamwork	Communication
Individual attributes that engender the trust, commitment, and the followership of others		
Core	Sandia Value	
	Professional/Technical Expertise	
Fundamental building blocks that define who we are and what we value		

The second category, Leadership, is defined as the ability to positively influence the attitudes and behaviors of others toward successful accomplishment of organizational needs. There are four competencies under this category: Dealing with Change, Taking Responsibility, Decision Making, and Developing Self and Others. Dealing with Change focuses on engaging and alerting others regarding the need to change and articulating behavioral and structural strategies for sustaining change. Taking Responsibility, the second competency under this category, highlights acting with accountability; doing everything within his/her power to meet objectives and agreed-upon goals, and working to avoid the “not my job” mentality. Decision Making focuses on consistently and in a timely fashion choosing the best course of action from a number of alternatives to address problems and taking advantage of opportunities. The last competency under this category, Developing Self and Others, recognizes and acts upon the need for continuous learning and demonstrates a genuine intent to develop employees through a variety of proven approaches such as coaching, mentoring, sponsoring, and delegating.

The third category, Interpersonal Skills, is defined as those individual attributes that engender the trust, commitment, and followership of others. The four related competencies under this category are Building Relationships, Diversity and Inclusion, Collaboration and Teamwork, and Communication. Building Relationships highlights building and maintaining productive business/professional relationships in the course of accomplishing individual, team, or work-group objectives. Diversity and Inclusion focuses on respecting, appreciating, and leveraging the perspectives and talents of a diverse workforce. Collaboration and Teamwork involves demonstrating the willingness to work cooperatively with others and being part of a team or work group to achieve shared objectives while being consistent with the business objectives of the organization. The last competency under this category, Communication, is defined as clearly conveying thoughts, concepts, directions, and feelings both orally and in writing and listening attentively to others' points of view.

The fourth category, Core, is defined as those fundamental building blocks that define who we are as an organization and what the organization values. There are two competencies under this category: Sandia Values and Professional/Technical Expertise. The Sandia Values competency directly reflects three of the five organizational values from the *Institutional Plan*. The other two values, Our People and Teamwork, are addressed within the competencies of Developing Self and Others, Diversity and Inclusion, and Collaboration and Teamwork. The first corporate value addressed under this competency is Integrity, defined as being honest in times of disagreement and demonstrating ethical behavior despite temptations to compromise. Excellence, the second corporate value, is defined as striving to help accomplish Sandia's cutting edge activities. The third value, Service to the Nation, is defined as making the most of every opportunity to render exceptional service in the national interest. The second competency under the Core category is Professional/Technical expertise, defined as having the professional/technical knowledge and skills to do the job at a high level of accomplishment.

For the purpose of this study, the Professional/Technical Expertise competency was not included. This was because this competency did not exist before the 2002 leadership assessment study that ascertained it was a skill lacking in the 360-degree tool. A recommendation for future study is to conduct a statistical analysis that includes this competency.

Leadership Indicators at Sandia National Laboratories

Sandia leader indicators were ascertained using three methodologies. The first methodology was to assess whether high performing leaders are present at Sandia. Included was identification of leaders who have competencies at or above the 90th percentile on the 360-degree success profile assessment tool. A second aspect of this methodology was an analysis to ascertain whether there is a relationship between competency scores within the 90th percentile and their related companion competencies as given in Table 7. This second aspect ties the success profile to the use of companion competencies, assisting Sandia in maximizing time spent developing leadership capabilities and enhancing organizational

effectiveness. Companion competencies are defined as those that, if an individual or group works on them, can indirectly improve the strength of another competency.

The second methodology used to assess leaders indicator at Sandia was ascertained by going through existing documentation and discussions with Corporate Education, Development and Training (CEDT) management, Integrated Enabling Services (IES) management, and the Strategic Education Committee (SEC). The conclusion was that, at this time, the only existing documentation of potential leader indicators potentially existed in the Manager Quality Index responses from the 2003 LMC Employee Preferences Survey results. The LMC survey was conducted with a random set of leaders throughout Sandia. For the purposes of this study, the term “manager” is synonymous with “leader”.

The LMC standardized survey is conducted every two years. The ten potential indicators are leadership, organization, empowerment, knowledge and expertise, development, feedback, recognition, fairness, work/life balance, and personality. Based on how each is defined, Table 2 shows the relationship between related Sandia Success Profile Competencies and the LMC Manager Quality Index. The LMC index defines leadership as vision that inspires the individual to work. Organization is defined as the leader enabling work to get done by providing the necessary balance of direction and resources. Empowerment is defined as enabling the freedom for individuals to make on-the-job decisions. Knowledge and expertise assess whether the leader has the capability important to the organization and the work being done. Development and Recognition focus on the leaders’ commitment to their peoples’ professional development and the ability to recognize individual contributions on the job. Feedback highlights the leaders’ capability to provide clear performance and work feedback. Fairness reflects the ability to be respectful and fair, and to provide consistent treatment of employees. Work/life balance is defined as assessing whether the leader is committed to providing flexibility in balancing work and nonwork responsibilities.

Table 2. Sandia Success Profile Competencies in Relation to LMC Manager Quality Index Aspects

Sandia Success Profile Competencies	LMC Manager Quality Index Aspects
Decision Making	Empowerment
Building Relationships	Work/Life Balance
Diversity and Inclusion	Fairness
Developing Self and Others	Development* and Recognition
Results	Organization*
Communication	Feedback
Professional/Technical Expertise	Knowledge and Expertise
Collaboration and Teamwork	
	Leadership*

*Considered an important leadership indicator

To verify and gain concurrence on the LMC Employee Preferences Survey leader indicators considered important at Sandia, the researcher went to the Sandia SEC for

verification of importance. The SEC members scored each indicator on a scale of one to six, with one being of low importance and six being most important. Each member was asked to rank their top five indicators.

Of the ten areas noted within the LMC survey relating to leader indicators at Sandia, the SEC identified three as being important. Results verified three leader indicators. All members were consistent in identifying leadership as most important. Leadership that inspires employees in their work ranked as most important by all respondents. It reflects how important leadership is as an indicator and in the rank order for each individual. The SEC scored Development and Organization as important with 66% response. Both Feedback and Fairness were considered important but did not receive a high rank order.

In support of understanding if there is a strong relationship between achieving organizational success and getting work done through people, a third methodology was utilized. This methodology was derived based on Zenger & Folkman's 2002 research. The results of the research brought out that leaders with high scores in interpersonal skills and getting organizational results tend to positively impact organizational effectiveness. This aspect compares results of two categories, Mission Success and Interpersonal Skills, for those leaders who have a score at or above the 90th percentile.

Hypotheses and Research Questions

Hypothesis #1. There is no significant difference between the Sandia National Laboratories 360-degree success profile assessment tool and leader indicators within the organization using the LMC Employee Preferences Survey.

Research question #1. What are the initial and final scores for those leaders who have taken the 360-degree success profile assessment tool?

Research question #2. For those with an LMC survey score, was there a difference in the initial-to-final score on the 360-degree success profile assessment tool?

Research question #3. For those leaders who have taken the 360-degree success profile assessment tool, does the LMC survey data reflect a difference in employee retention, employee engagement, and commitment?

Hypothesis #2. High performing leaders are present at Sandia National Laboratories.

Research question #1. What are the numbers of leaders that are at or above the 90th percentile scores at the competency level?

Research question #2. Is there a relationship between competencies that could reflect companion competency sets?

Research question #3. For our leaders with competency scores at or above the 90th percentile, how do their results compare in the two categories, Mission Success and Interpersonal Skills?

ANALYSIS, CONCLUSIONS, AND RECOMMENDATIONS FOR FUTURE STUDY

This section presents the study data. Two hypotheses and three related questions each were analyzed. Data were derived through statistical analysis of Sandia's 360-degree success profile assessments and high performing leader indicators within the organization based on the LMC Employee Preferences Survey. Study demographics were determined and verified for both tools used in the study. Hypotheses one and two were statistically proven to be true. Implementation of the Success Profile Competency set has made a difference for leaders. There is a significant difference between two of the success profile competencies and the LMC survey results. The presence of high performing leaders was statistically shown to exist at Sandia.

Study Demographics

Participants in the study were made up of individuals who have taken either of two assessment tools. The first assessment was the Sandia National Laboratories 360-degree success profile assessment, with a study focus on those identified in a formal leadership role. The second assessment tool was the LMC Employee Preferences Survey.

The first step was data verification. Data verification for the 360-degree success profile assessment tool was done by matching each name in the database to both the organizational directory and to a list of class attendees supplied through the CEDT department corporate database. From the original 2116 rows of data, 34 were removed due to lack of scores. Ninety-four rows were removed due to the names not matching to the organizational directory or a class list, or there were 2 or more "same names" in the directory to choose from. After removing these 126 rows of data, there were 1988 remaining.

To assist in answering how many individuals have both initial and final data, further analysis was conducted. There were 1085 rows of data with only one record per person, and 903 rows with two or more records for the same person. Of the 903 rows with multiple records per person, 333 rows were removed for having more than 2 rows per person that either reflected the same data or the name was listed on the class list but not on the data spreadsheet. This left a total of 570 rows of records reflecting 285 individuals with both an initial and final score on the 360-degree success profile assessment tool. In total, the database reflected that there were 1370 individuals with solid data for this study.

Data verification for the LMC Employee Preferences Survey included recognition that only those individuals with three or more responses would be included in the study. There were 185 individuals with an LMC survey. Of these, there were 172 that qualified for the study by having three or more responses. Further assessment revealed that there were 39 individuals, 23% of the total, who had data that included initial and final scores on the 360-degree success profile assessment tool and the LMC survey.

Since the 360-degree success profile began in 1994, there have been three reassessments to ascertain whether the Success Profile Competency set was adequate to get the organization to where it needs to be in the next two to five years. The latest, in 2002, brought about an updated competency model that incorporated the strengths of the existing competencies while bolstered by one new competency—Professional/Technical Expertise. Table 3 reflects category and competency names prior to and after the 2002 competency revision. Based on description details for the competencies, 14 of the 15 competencies mapped to ones in existence before 2002. Because the Professional/Technical Expertise competency lacked data before 2002, it was not included in the study statistical analysis.

**Table 3. Comparison of Category and Competency Names
Prior to and After 2002 Competency Revision**

Category or Competency	Name Prior to Early 2002	Name After Early 2002
Cat1	Mission Success	Mission Success
Comp1	Business Acumen	Business Acumen
Comp2	Results	Results
Comp3	Customer Focus	Customer Focus
Comp4	Strategic Ability/Setting Priorities	Strategic Perspective
Comp5	Organizational Agility	Innovation
Cat 2	Leadership	Leadership
Comp6	Dealing with Ambiguity	Dealing with Change
Comp7	Interpersonal Savvy	Taking Responsibility
Comp8	Decision Quality	Decision Making
Comp9	Developing and Motivating Others	Developing Self and Others
Cat3	Personal Characteristics	Interpersonal Skills
Comp10	Organizational Courage	Building Relationships
Comp11	Building Team Spirit	Collaboration and Teamwork
Comp12	Managing Diversity	Diversity and Inclusion
Comp13	Listening	Communication
Cat4	People Development	Core
Comp14	Ethics and Values	Sandia Values
Comp15*	Learning on the Fly	Professional/Technical Expertise

*There is no comparison for competency 15 as it has been defined differently prior to and after 2002 competency revision.

Study Analysis and Conclusions: Hypothesis 1 and Related Research Questions

The first hypothesis focused on whether there was a difference between Sandia's 360-degree success profile assessment tool and leader indicators within the organization using the LMC employee preference survey. The first research question associated with Hypothesis 1 looked at the initial and final scores for those leaders who have taken the 360-degree success profile assessment tool. The second question assessed if there was a difference, for those who have an LMC survey, in the pre-to-post scores on the 360-degree assessment tool. The third question associated with Hypothesis 1 determined whether, for those who have taken the 360-degree success profile assessment tool, the LMC survey data reflect a difference in employee retention, employee engagement, and commitment.

Hypothesis 1, a null hypothesis, was proved to be false. The data reflect that there is a statistical relationship between the 360-degree Success Profile Competencies and leader indicators from the LMC employee preference survey. In comparing initial-to-final 360-degree scores for leaders the data support two statistically significant competencies. Both Business Acumen and Sandia Values, at the $p=0.02$ level, reflect the desire to change the organizational culture toward a more business focus while continuing to maintain integrity, excellence, and service to the nation. In support of research question two, four competencies reflect a strong statistical difference for leaders with both initial-to-final 360-degree scores and the LMC survey. The four competencies are Sandia Values with a p level of 0.00, Diversity and Inclusion at $p=0.02$, Dealing with Change at $p=0.03$, and Developing Self and Others with a p level of 0.04. Research question three data results determined that there was not a statistical connection, in terms of employee retention, engagement and commitment, between leaders with both survey tools.

Hypothesis 1 results support that the Success Profile Competencies have made a difference in terms of what is important to the organization. Specifically, initial-to-final scores in three competencies directly support an improvement from where leaders were ten ago and the present. The improvements in Business Acumen, Diversity and Inclusion, and Dealing with Change directly relate to initially identified gaps in business savvy, managing diversity, and dealing with ambiguity.

Hypothesis 1 – Research Question #1 Analysis

Research question number one assessed the initial and final scores for those leaders who have taken the 360-degree success profile assessment tool and whether there were any statistical significant conclusions that can be drawn. Table 4 lists the initial and final means and the paired t-test p -values for each competency.

The initial score on the 360-degree success profile assessment tool reflects the first time that an individual completed the assessment. Final scores represent the score from taking the assessment tool at least one year or more after the initial assessment. Both the Business Acumen and Sandia Values competencies had a statistical significance at the $p=0.05$ level. A statistical significance in the Business Acumen competency is consistent with the change

in organizational culture toward the need to account for costs and working to maintain the integrity, excellence, and service to the nation that has been the cornerstone for the organization.

Table 4. Study Results Highlighting the Population with Initial and Final Scores on the 360-Degree Success Profile Assessment Tool (n=285)

Competency	Variable	Initial Mean	Final Mean	t-Test p-Value
Business Acumen	Com1	76.2	77.9	0.02*
Results	Com2	81.4	80.2	0.09
Customer Focus	Com3	78.1	78.7	0.37
Strategic Perspective	Com4	76.9	76.2	0.31
Innovation	Com5	78.6	78.8	0.73
Dealing with Change	Com6	74.6	75.3	0.31
Taking Responsibility	Com7	77.9	78.3	0.58
Decision Making	Com8	77.4	76.5	0.26
Developing Self and Others	Com9	78.9	78.3	0.31
Building Relationships	Com10	79.0	78.9	0.89
Collaboration and Teamwork	Com11	78.5	78.3	0.75
Diversity and Inclusion	Com12	77.3	77.8	0.49
Communication	Com13	78.0	78.3	0.65
Sandia Values	Com14	82.9	84.4	0.02*

*Significant at p=.05 level

The training making a significant difference in the Business Acumen and Sandia Values competencies reflects that knowledge from the class was applied and that new behaviors were incorporated and observed by others. The other 12 competencies did not reflect a statistical significance. This study did not include exploring what might have brought this about. A good question for further investigation would be to ascertain whether there is a possible connection between competencies that individuals choose to work on in their action plans and significant statistical differences in their initial and final scores.

Hypothesis 1 – Research Question #2 Analysis

Research question two related to Hypothesis 1 assessed whether there was a difference, for those who have an LMC survey, in the initial-to-final scores on the 360-degree assessment tool. There was a total of 285 individuals who had both initial and final scores on the 360-degree assessment tool. Out of that 285, there were 39 that also had scores from the LMC survey.

The scatter plots cited in Figures 2a through 15a compare individuals in two areas. The first are those who have LMC data as well as initial-to-final Sandia success profile assessment tool scores. Each scatter plot has a line drawn at y=x. Data values above the line represent individuals with final scores that were larger than their initial scores. Data values below the

line represent individuals with final scores that were less than their initial scores. The black dots represent individuals with initial and final success profile assessment tool scores. The red squares represent individuals who had the LMC data as well as the success profile assessment. Further exploration of the second question for Hypothesis 1 is presented in Figures 2b through 15b. These figures reflect a histogram diagram for each competency showing the differences from initial-to-final 360-degree score. The mean difference is measured from -1 to +1 and is reflected by those individuals whose mean difference did not improve or decline from the initial to the final.

For those individuals with only the 360-degree success profile assessment, the Business Acumen competency scatter plot reflects 138 data values above the line and 108 data values below the line. Those 39 who had both the success profile and the LMC survey had 26 above the line and 13 below the line. The histogram of differences reflects a difference range of -40 to +40 with 135 showing improvement, 96 reflecting a decline, and 54 showing no change.

Results had 101 above the line and 145 below the line for those with the success profile assessment. For those who also had the LMC survey, results scores reflected 22 above and 17 below the line. The histogram of differences reflects a difference range of -30 to +40, with 101 showing improvement, 122 declining, and 62 showing no change.

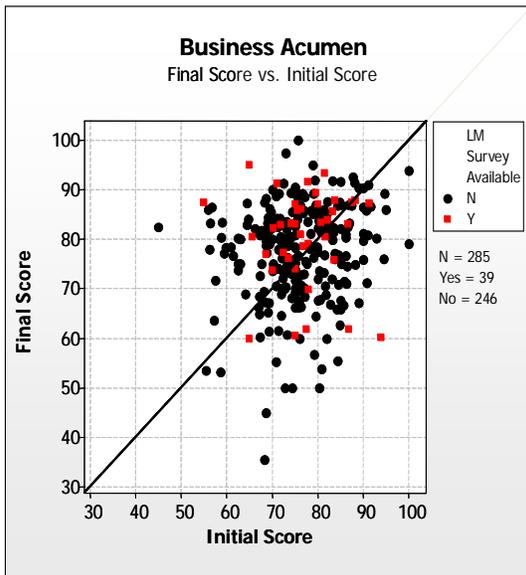


Figure 2a. Business Acumen Scatter Plot

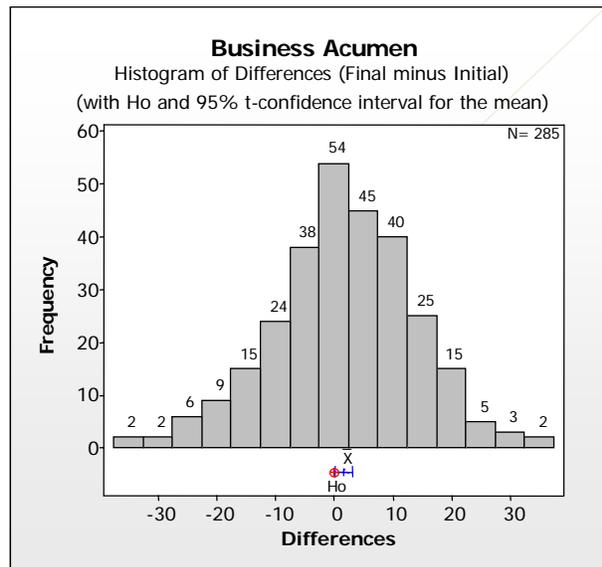


Figure 2b. Business Acumen Histogram

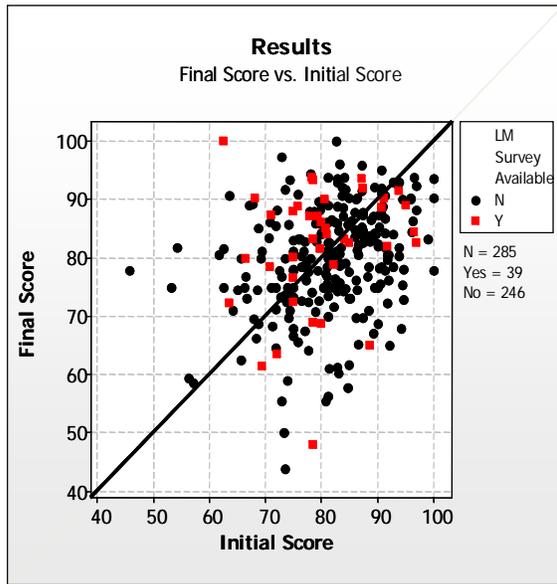


Figure 3a. Results Scatter Plot

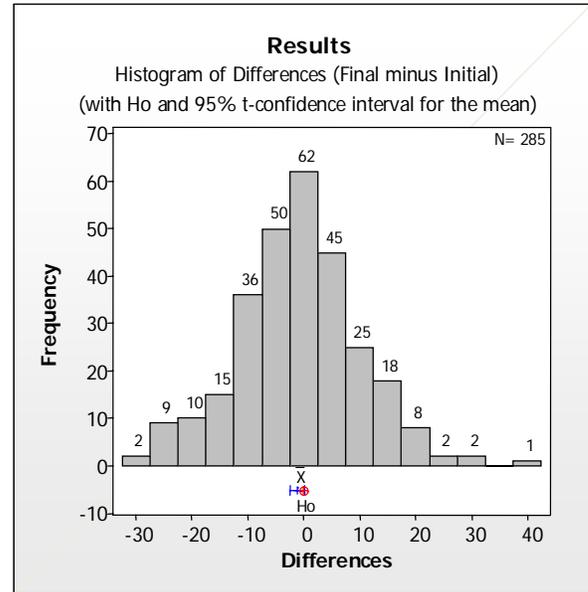


Figure 3b. Results Histogram

The Customer Focus competency had 121 data values above the line and 125 below for those who had only the success profile assessment and 21 above and 18 below for those who also had the LMC survey. The histogram of differences reflects a difference range of –30 to +40, with 114 showing improvement, 3 outliers with significant improvement scores, 109 declining, and 59 showing no change.



Figure 4a. Customer Focus Scatter Plot

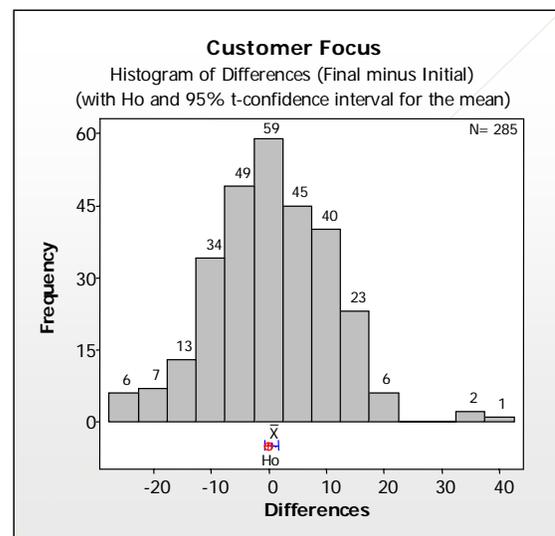


Figure 4b. Customer Focus Histogram

For those who had the success profile only, Strategic Perspective scores reflect 119 above and 127 below the line. For those with both tools, there were 19 who scored above the line and 20 below the line. The histogram of differences reflects a difference range of -30 to +40, with 110 showing improvement, 120 declining, and 55 showing no change.

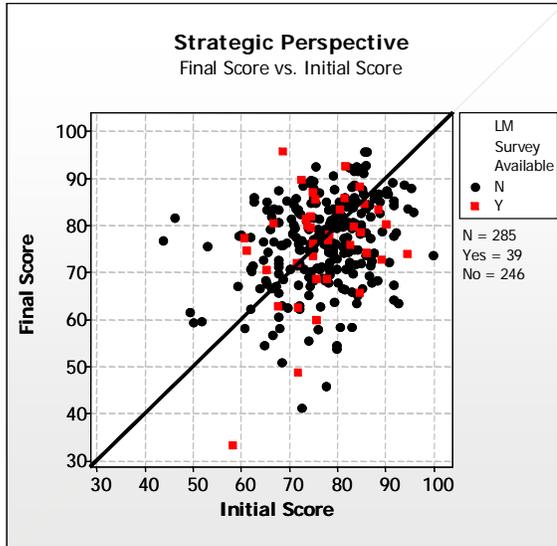


Figure 5a. Strategic Perspective Scatter Plot

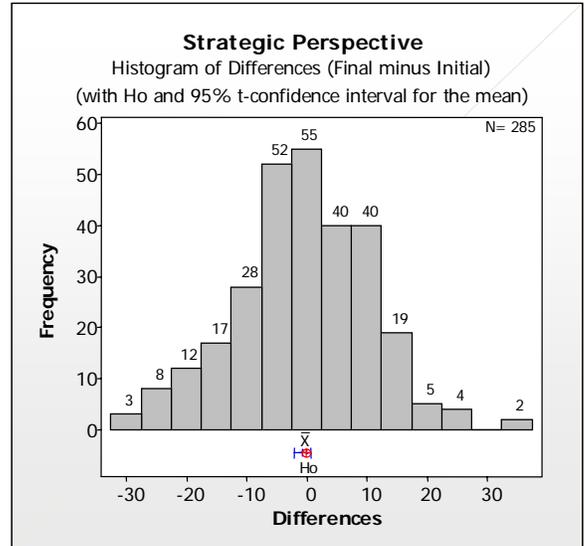


Figure 5b. Strategic Perspective Histogram

The Innovation competency scatter plot had 128 data values above and 118 below the line for those with only the success profile assessment and 24 above and 15 below for those who also had the LMC survey. The histogram of differences reflects a difference range of -40 to +30, with 122 improving, 108 declining, and 55 showing no change.

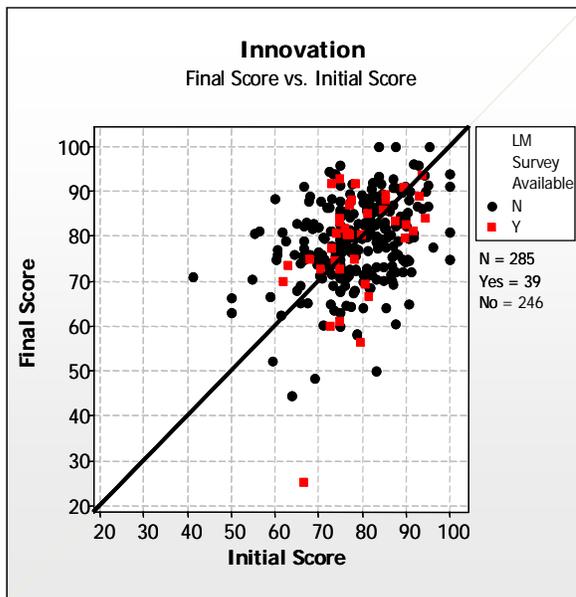


Figure 6a. Innovation Scatter Plot

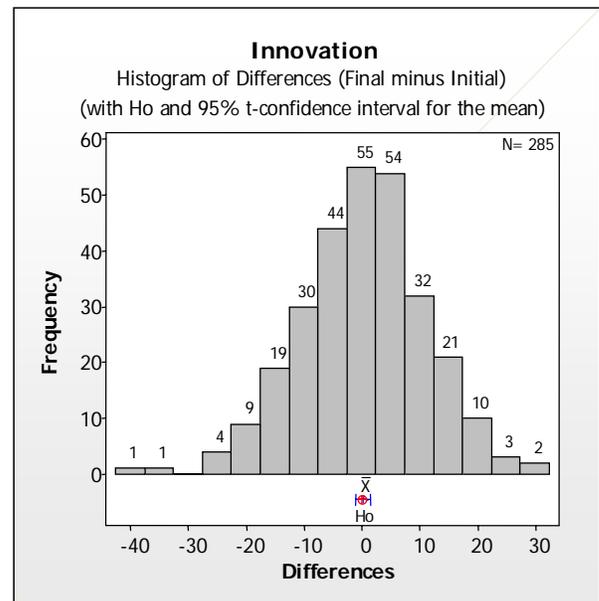


Figure 6b. Innovation Histogram

Dealing with Change had 128 above and 117 below the line with 1 null value due to lack of data for one individual. For those with both tools, there were 24 above and 15 below the line. The histogram of differences reflects a difference range of -50 to +40, with 123 improving, 99 declining, 1 outlier with a significant decline of -50, and 61 showing no change.

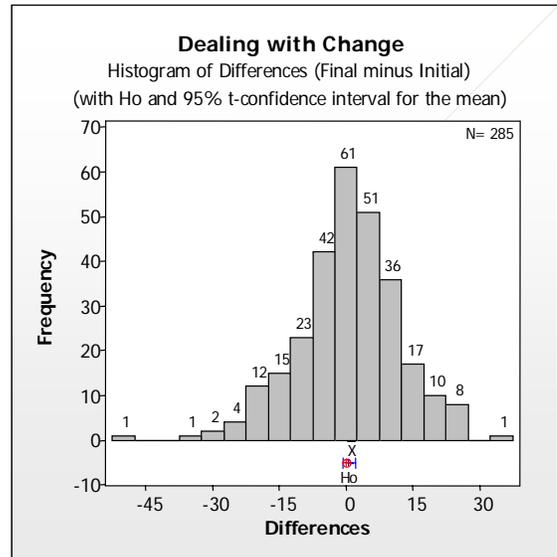
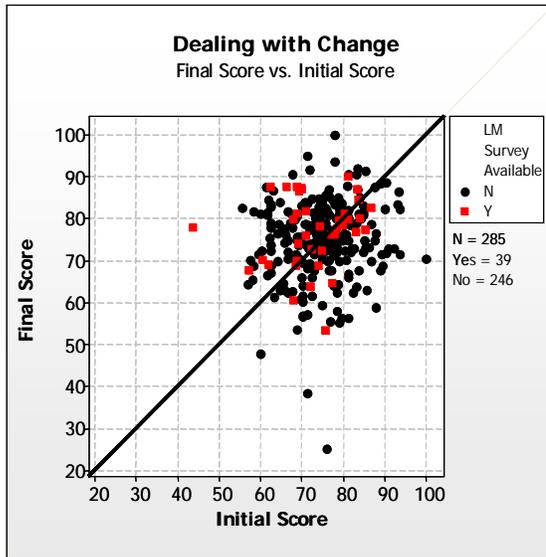


Figure 7a. Dealing with Change Scatter Plot Figure 7b. Dealing with Change Histogram

Taking Responsibility had 127 data values above and 118 below the line for those who had only the success profile assessment tool. There were 25 above and 14 below the line for those with both tools. The histogram of differences reflects a difference range of -40 to +40, with 130 improving, 108 declining, 1 outlier with a significant decline at -70, and 46 showing no change.

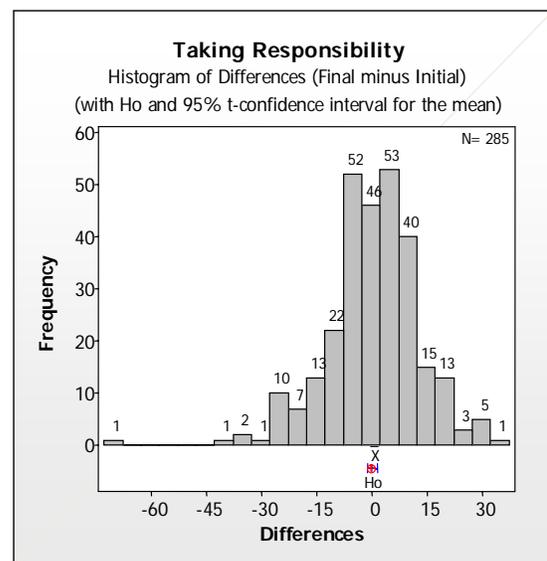
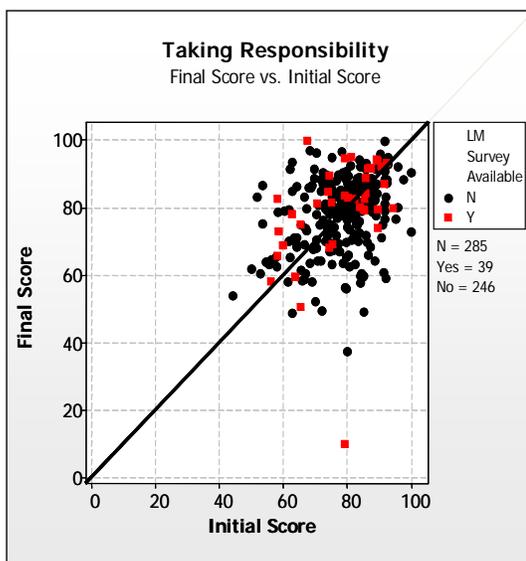


Figure 8a. Taking Responsibility Scatter Plot Figure 8b. Taking Responsibility Histogram

Decision Making had 114 above and 132 below the line and 20 above with 19 below respectively for those with only the success profile and those with both that and the LMC survey. The histogram of differences reflects a difference range of -45 to +40, with 115 improving, 125 declining, and 45 showing no change.

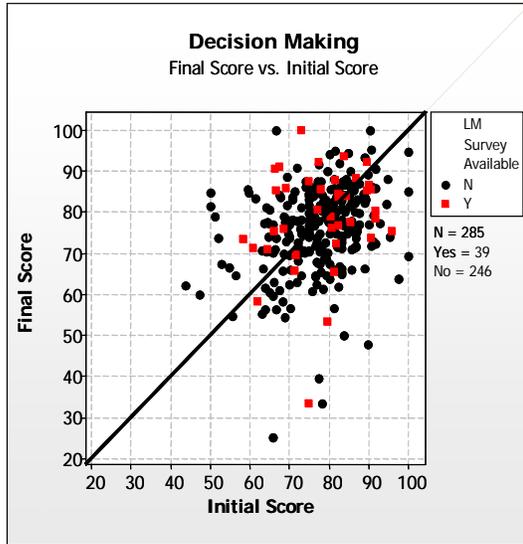


Figure 9a. Decision Making Scatter Plot

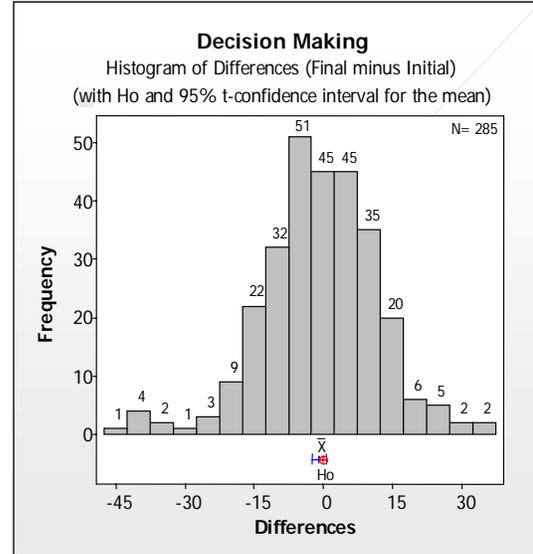


Figure 9b. Decision Making Histogram

The Developing Self and Others competency had 113 above and 132 below the line with 1 null value due to lack of data for one individual. For those with both assessment tools, this competency had 25 above and 14 below the line. The histogram of differences reflects a difference range of -40 to +30, with 109 improving, 112 declining, and 63 showing no change.

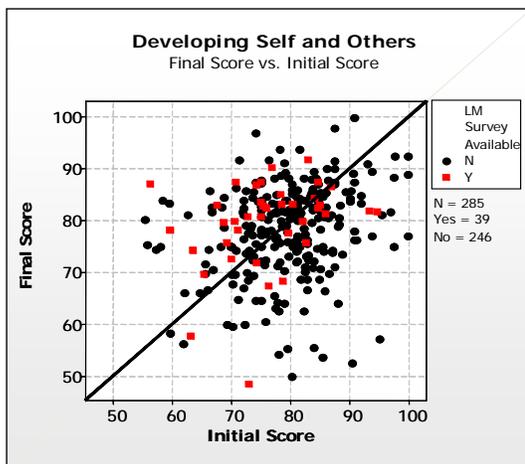


Figure 10a. Developing Self and Others Scatter Plot

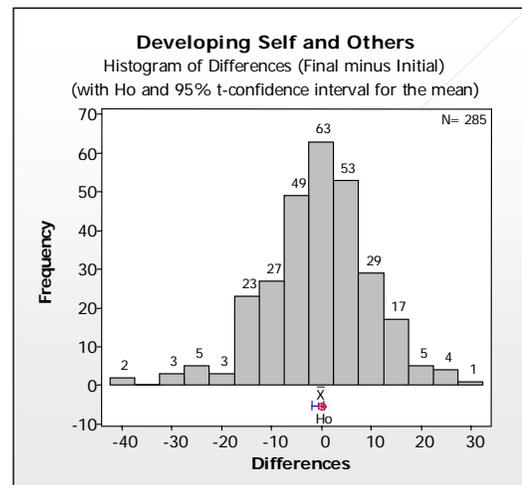


Figure 10b. Developing Self and Others Histogram

There were 123 data values above and 123 below the line on the Building Relationships competency for those with only the success profile assessment. For those with both tools, the scores were 27 above and 12 below. The histogram of differences reflects a difference range of -40 to +40, with 127 improving, 111 declining, and 47 showing no change.

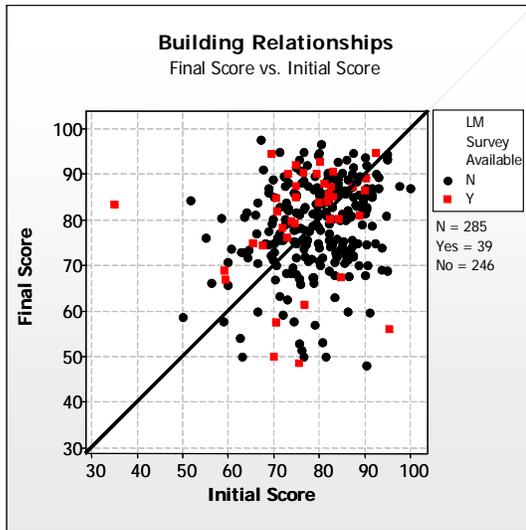


Figure 11a. Building Relationships Scatter Plot

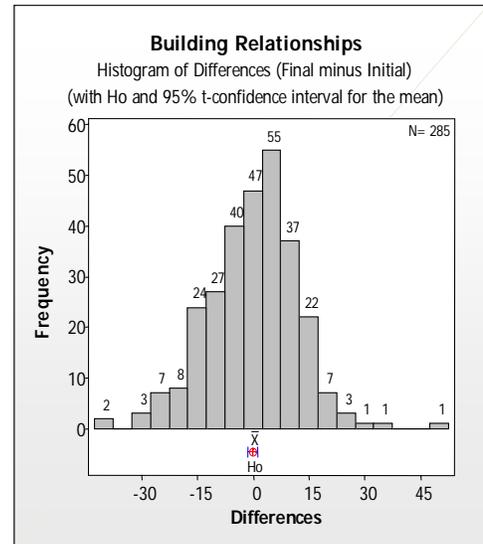


Figure 11b. Building Relationships Histogram

Collaboration and Teamwork had 116 values above the line and 130 below the line for those who had only the success profile assessment tool. There were 24 above and 15 below the line for those who had both assessment tools. The histogram of differences reflects a difference range of -50 to +30, with 114 improving, 113 declining, and 58 showing no change.

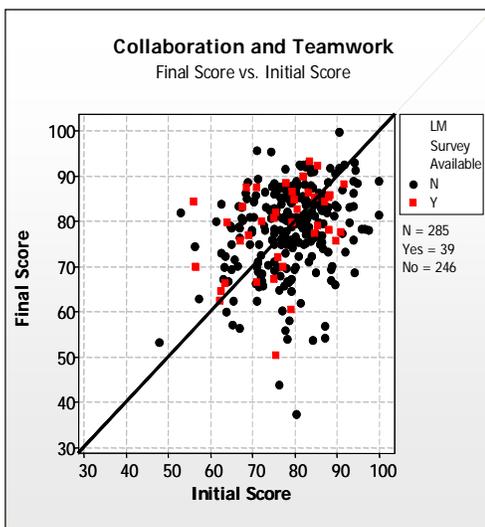


Figure 12a. Collaboration and Teamwork Scatter Plot

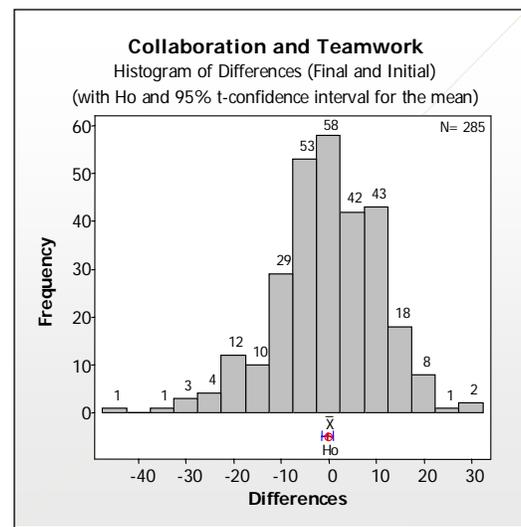


Figure 12b. Collaboration and Teamwork Histogram

Diversity and Inclusion had 128 above the line, 118 below the line, and 30 above with 9 below the line for those who had the success profile assessment tool and those who also had the LMC survey respectively. The histogram of differences reflects a difference range of -45 to +40, with 134 improving, 100 declining, and 51 showing no change.

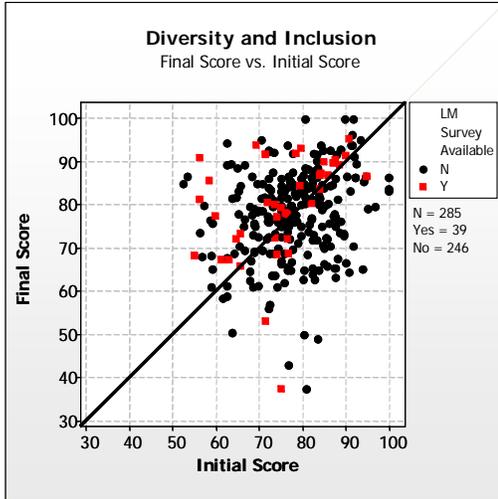


Figure 13a. Diversity and Inclusion Scatter Plot

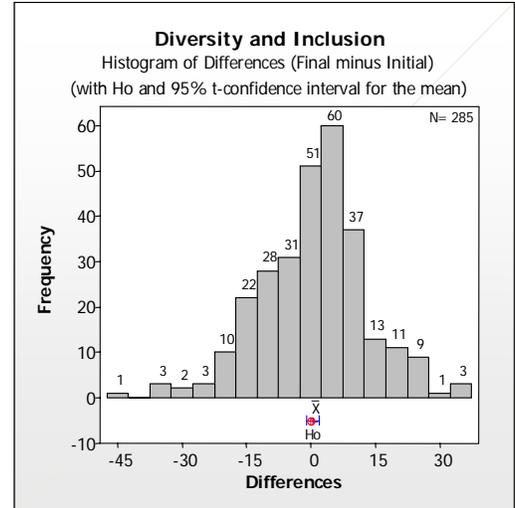


Figure 13b. Diversity and Inclusion Histogram

Communication had 129 data values above the line and 117 below for those who had only the success profile assessment tool. For those who had that as well as the LMC survey, there were 23 above and 16 below the line. The histogram of differences reflects a difference range of -30 to +50, with 113 improving, 1 outlier with significant improvement, 101 declining, and 70 showing no change.

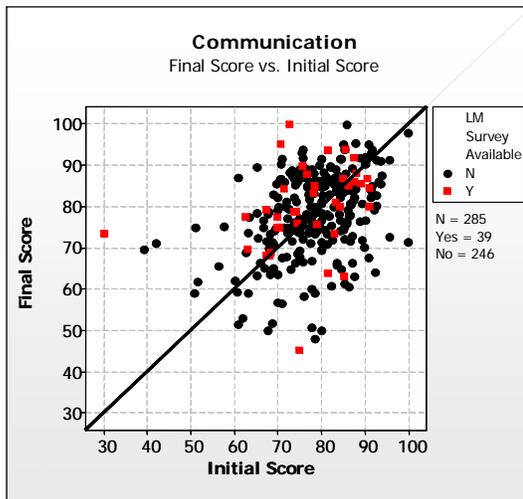


Figure 14a. Communication Scatter Plot

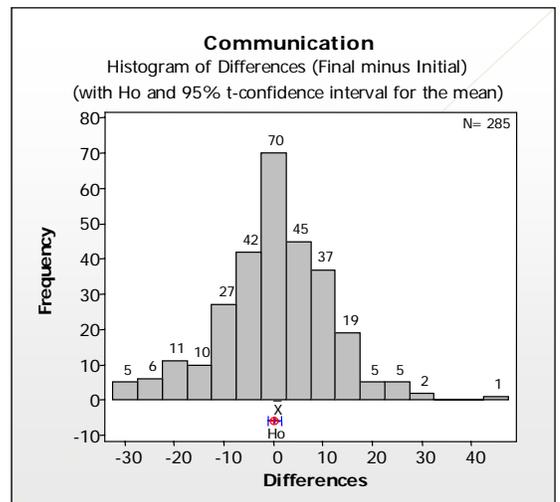


Figure 14b. Communication Histogram

Sandia Values had 138 above the line and 108 below the line for those with only the success profile assessment and 31 above and 8 below the line for those who had both tools. The histogram of differences reflects a difference range of -30 to +50, with 131 improving, 91 declining, and 63 showing no change.

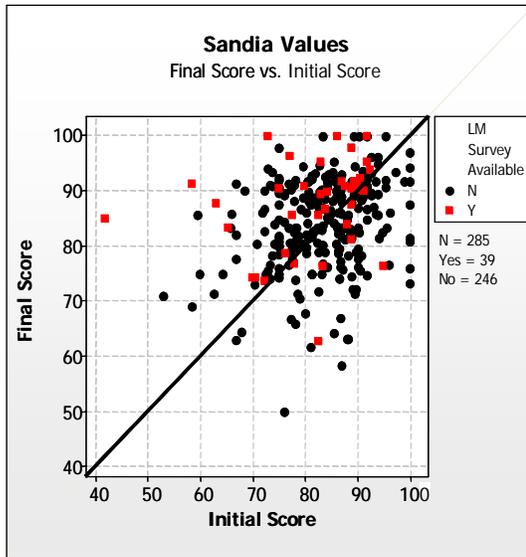


Figure 15a. Sandia Values Scatter Plot

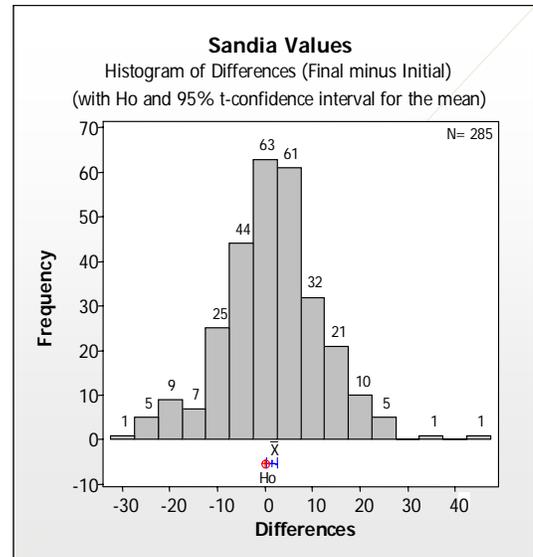


Figure 15b. Sandia Values Histogram

Table 5 lists the initial and final score means and the paired t-test p-value for each competency. The scatter plots in Figures 2a through 15a also reflect these results as identified by red squares.

Four competencies with statistically significant differences at the $p=0.05$ level directly support the leader indicators identified by the SEC. The SEC identified leadership as being the most overall important leader indicator. Two success profile competencies that have statistical significance are within the leadership category. The Developing Self and Others competency, at 0.04, supports the SEC philosophy that leaders need to recognize and act upon the need for continuous learning as well as demonstrating a genuine intent to develop their employees. The Dealing with Change competency, at 0.03, supports the SEC philosophy that Sandia needs to articulate behavioral and structural strategies for sustaining continuous learning.

The third competency with a statistical significance at the $p=0.02$ level is Diversity and Inclusion. This competency ties with the LMC Manager Quality Index (MQI) aspect of fairness. The SEC considered fairness as an important leader indicator; but conversely, it did not receive a high rank order. However, being fair by respecting and appreciating the talents of a diverse workforce is recognized as an important organizational consideration. The fourth competency with a strong statistical significance at $p=0.00$ was Sandia Values. This result reflects the SEC's desire to continue organizational service to the nation and maintaining cutting edge technology capabilities through continuous learning.

Table 5. Sub-Population with Results on Both LMC Survey and Initial/Final Scores on the 360-Degree Success Profile Assessment (n = 39)

Competency	Variable	Initial Mean	Final Mean	t-Test p-Value
Business Acumen	Com1	77.2	80.6	0.10
Results	Com2	80.0	82.1	0.31
Customer Focus	Com3	77.9	79.9	0.25
Strategic Perspective	Com4	76.7	76.2	0.80
Innovation	Com5	78.9	78.6	0.87
Dealing with Change	Com6	73.0	77.0	0.03*
Taking Responsibility	Com7	78.0	79.5	0.54
Decision Making	Com8	78.2	78.9	0.78
Developing Self and Others	Com9	76.0	79.5	0.04*
Building Relationships	Com10	76.6	79.9	0.18
Collaboration and Teamwork	Com11	76.8	78.8	0.26
Diversity and Inclusion	Com12	74.9	79.7	0.02*
Communication	Com13	77.0	80.0	0.16
Sandia Values	Com14	81.4	87.5	0.00*

*Significant at p=.05 level

Hypothesis 1 – Research Question #3 Analysis

The third research question associated with Hypothesis 1 determined whether, for those who have taken the 360-degree success profile assessment tool, the LMC survey data reflected a difference in employee retention, employee engagement, and commitment. In assessing employee retention, the LMC survey considered the risk of organizational turnover. Respondents were asked to consider whether they were thinking of quitting their job, whether they intended to look for a job with another company within the next year, or whether they were actively looking for another job. Engagement with their work was assessed by asking respondents to consider whether they are constantly looking for ways to do their work better, whether there are days that they do not put much effort into the job, or whether they are willing to put in the extra effort to get a job done. Employee commitment was assessed by asking respondents to consider whether they would be happy spending the rest of their career with this organization, whether they would recommend the organization as a great place to work, or whether they considered themselves emotionally attached to the organization.

There were 185 individuals with scores from the LMC Employee Preferences Survey. Of the 185, 122 out of the complete 360-degree success profile database also had scores on the 360-degree success profile assessment tool with 63 having only the LMC survey. Table 6

lists the score means, the standard deviations, and the two sample t-test p-values comparing these two groups for each variable. The box plots reflected in Figures 16 and 17 are another way to represent the differences for the LMC scores between those who have and have not had the 360-degree success profile assessment tool. The box plots show the minimum, maximum, and midpoint of the data comparing the two groups. For each variable, the two groups are essentially the same.

Table 6. LMC Population With and Without 360-Degree Success Profile Assessment Tool (n=185)

Descriptor	Variable	Those Who Have the 360-Degree Success Profile Tool (n=122)		Those Who <u>Do Not</u> Have the 360-Degree Success Profile Tool (n=63)		t-test p-value
		Mean	Std. Dev.	Mean	Std. Dev.	
Employee Commitment Index	ECI	0.22	0.182	0.25	0.193	0.39
Employee Engagement Index	EEI	0.63	0.116	0.66	0.118	0.11
Employee Retention Index	ERI	0.65	0.170	0.65	0.178	0.77
Manager Quality Index	MQI	0.45	0.199	0.47	0.209	0.57
Gives Flexibility to Do My Work	R_NAM01	0.53	0.229	0.54	0.198	0.81
Good Balance of Direction and Resources	R_MAN03	0.36	0.239	0.36	0.264	0.89
Respectful and Fair	R_MAN04	0.52	0.204	0.55	0.217	0.35
Gives Freedom to Make Decisions	R_MAN05	0.61	0.188	0.59	0.232	0.45
Communicates Well; Gives Feedback	R_MAN06	0.35	0.255	0.37	0.241	0.57
Recognizes Me for My Contributions	R_MAN07	0.38	0.229	0.42	0.243	0.37
Committed to Professional Development	R_MAN08	0.39	0.247	0.41	0.250	0.68
Has Knowledge and Expertise	R_MAN09	0.50	0.257	0.54	0.244	0.22
Has Good Personality	R_MAN10	0.59	0.210	0.61	0.241	0.70

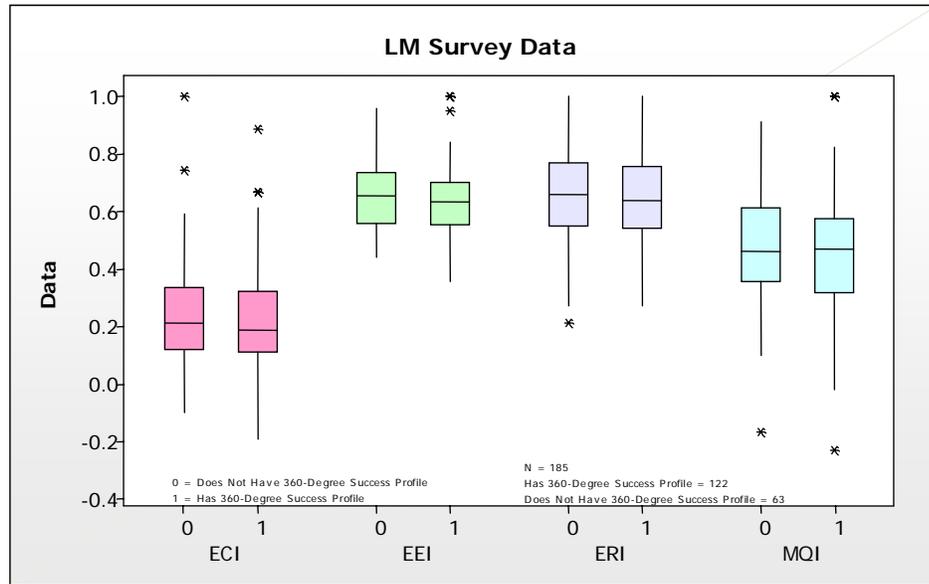


Figure 16. LMC Survey Data

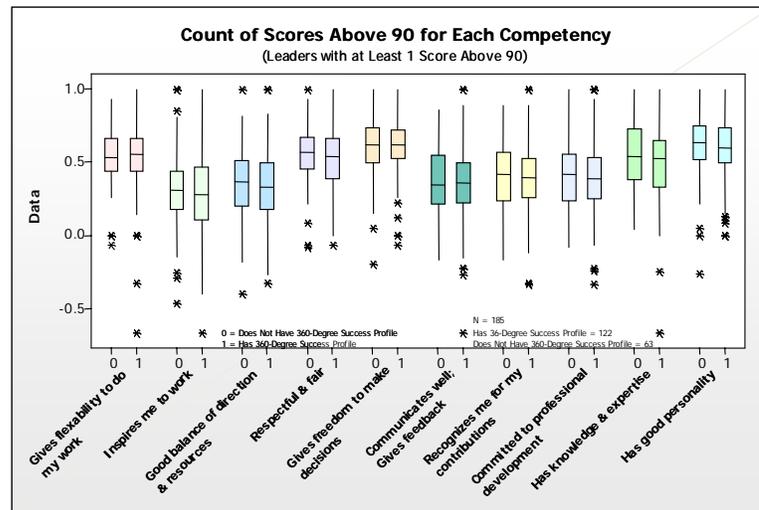


Figure 17. LMC Survey Data Boxplot

Both the 360-degree success profile assessment tool and the LMC survey are similar in that the higher the score, the greater reflection of that individual being a high performing leader. It is interesting to note that it is perceived that if an individual participated in the 360-degree assessment followed by making behavioral change(s), that change would be reflected in higher scores on the LMC Employee Preferences Survey. However, the study results reflect that whether or not an individual took the LMC survey, there was not a statistical impact in their success profile assessment results. Based on the analysis, there is no statistically significant relationship between individuals who took the LMC survey and the 360-degree success profile assessment tool. Both are individual tools that the researcher explored as having a potential connection. The lack of statistical impact is not a surprise as, at this point, these two tools are the only ones currently identified and in use at Sandia.

Study Analysis and Conclusions: Hypothesis 2 and Related Research Questions

The second hypothesis focused on whether there is the presence of high performing leaders at Sandia. Data were derived from feedback input from the leaders' direct manager, their peers, staff, and customers. The first research question associated with Hypothesis 1 ascertained the number of leaders at or above the 90th percentile at the competency level. Research question two looked at whether there was a relationship between competencies that could reflect companion competency sets. The third question compared, for leaders with competency scores at or above the 90th percentile, results in two categories: Mission Success and Interpersonal Skills.

Hypothesis 2 is proven true as the presence of high performing leaders has been demonstrated at Sandia. The data reflect the existence of 529 leaders with one or more scores at or above the 90th percentile on the 360-degree success profile assessment tool. Within the 529, study data reflect 199 individuals with three or more competencies at this level. According to Zenger & Folkman's 2002 research, the presence of high performing leaders directly links leaders with three or more competencies, at the 90% level, to organizational effectiveness through keeping and retaining staff, having a strong strategic focus, a clear vision, better communication, and delivery of results. Research question two results determined that there are tightly interwoven competencies, called companion competencies, for each competency. In support of research question three, study data determined a strong correlation between the Mission Success and Interpersonal Skills success profile categories. This connection is essential as it supports that achieving organizational results is statistically related to getting the work accomplished through people.

Hypothesis 2 – Research Question #1 Analysis

Research question one for Hypothesis 2 determined the number of leaders with scores at or above the 90th percentile on the success profile assessment tool. To determine results, the complete database of 1370 individuals was considered. Of the 1370, there were 529 individuals with at least one competency score at or above the 90th percentile as cited in Figure 18. Of these 529, there were 226 individuals with only one score and 104 with at least two competencies scoring at or above the 90th percentile. According to Zenger & Folkman (2002) individuals scoring at this level on three or more competencies are considered high performing leaders. The study results cite 199 individuals within this grouping. There were 67 individuals with three competencies at or above the 90th percentile. For those scoring at or above the 90th percentile on four competencies, there were 36 individuals followed by 24 and 17 who scored at this level for five competencies. There were 47 individuals who had 7 and 11 competencies at or above the 90th percentile. There were three individuals who had 12 competencies at or above the 90th percentile. Two individuals had 13 and two had all 14 at or above the 90th percentile.

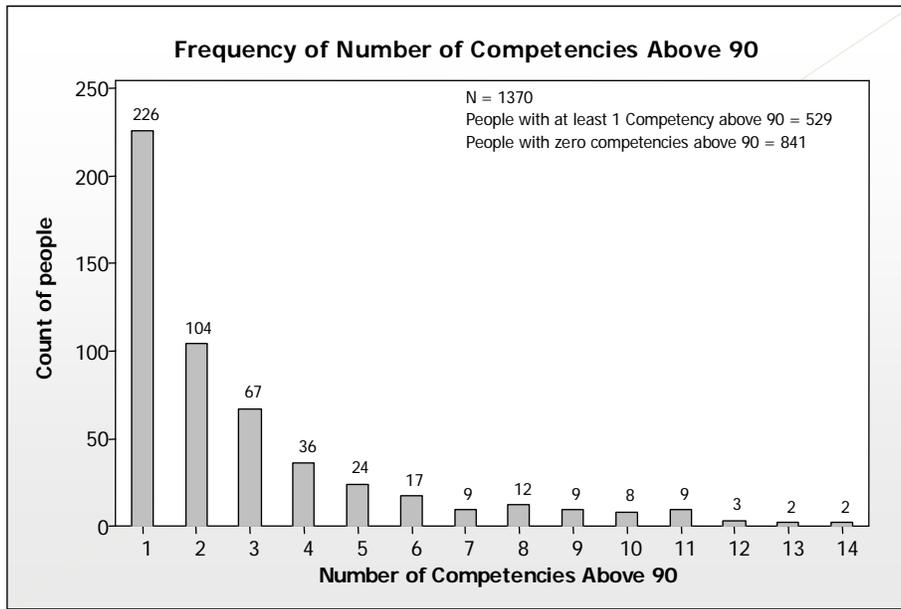


Figure 18. Number of Individuals with One Competency At or Above the 90th Percentile

Further examination of the database was done by determining what competencies had scores at or above the 90th percentile. Survey results reflect that each competency has at least one score at that level.

There was a total of 1510 scores at or above the 90th percentile. Every competency had a potential top score of 529. The Sandia Values competency, at 307, had the highest number of leaders with at least one score at or above the 90th percentile. This finding is consistent with this competency making a strong statistical significance for those leaders with both initial-to-final scores on the success profile assessment tool and the LMC survey with $p=0.02$ and $p=0.00$ respectively. Results was the next highest at 198 individuals with scores in this range. Building Relationships, at 132, had the third highest number. Taking Responsibility and Innovation had 118 and 114 individuals respectively that scored at or above the 90th percentile in those competencies. Communication had 98 individuals in this range. The Diversity and Inclusion, Decision Making, and Customer Focus competencies fell within the 82 to 85 range of individuals at or above the 90th percentile. Developing Self and Others and Collaboration and Teamwork had 75 and 72 individuals respectively.

It is significant to note that, at $p=0.02$, the Business Acumen competency had a statistically significant difference on the initial-to-final scores on the success profile assessment tool. However, this competency, with only 52 individuals at or above the 90th percentile, had next to the lowest number of individuals. An interesting future study would be to assess what might be causing this difference.

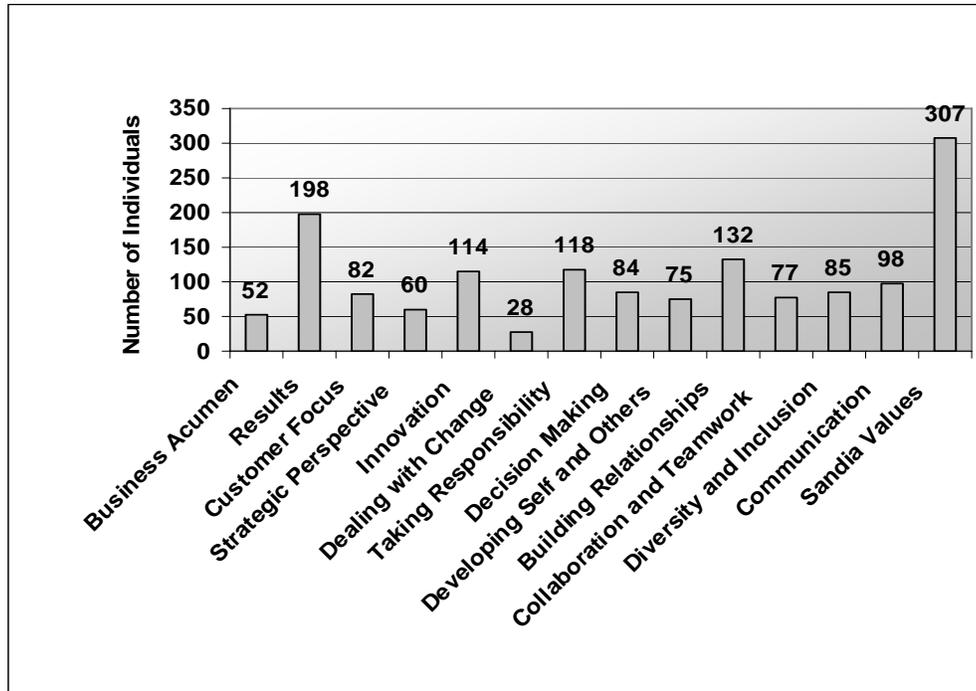


Figure 19. Number of Individuals with Scores At or Above the 90th Percentile Within Each Competency

Dealing with Change at 28 had the lowest number of individuals at or above the 90th percentile. It would be assumed that there would be a high number of individuals at this level as it was one of the original skill sets identified as necessary for organizational success. This has potential for some concern across the organization because having the ability to articulate strategies in support of continuous learning is an important leadership indicator at Sandia per the SEC. The question on what might be causing this discrepancy would make a good future study.

Hypothesis 2 – Research Question #2 Analysis

Research question two looked at whether there is a relationship between competencies that could reflect companion competency sets. Companion competencies are those tightly interwoven competencies that build upon one another and provide clues for an individual on how to put together the most effective and efficient action plan.

Table 7 shows each pair-wise correlation between competencies for the 529 individuals with at least one score at or about the 90th percentile. The correlation coefficient identified the degree of relationship between two variables with the value ranging from -1 to +1 with -1 demonstrating perfect negative correlation and +1 demonstrating perfect positive correlation. Values near zero indicate little relationship, either negative or positive, between the two variables. A correlation score of .4 or higher was used to define a relationship between two competencies. Each competency had at least one tightly connected companion competency.

Survey results highlight a strong correlation between all competencies within the Mission Success category. Business Acumen had eight companion competencies. Three competencies were within the 0.405 to 0.460 range. Collaboration and Teamwork was related at 0.405 followed by Dealing with Change at 0.433 and Building Relationships at 0.460. Three competencies fell within the 0.503 to 0.541 score range. Decision Making scored 0.503, Customer Focus at 0.531, Results at 0.535, and Strategic Perspective correlated at 0.541. The Innovation competency had the highest correlation at 0.591.

The Results competency had seven companion competencies. Three competencies were within the 0.444 to 0.488 score range. Collaboration and Teamwork was related at 0.444, Building Relationships at 0.445, and Dealing with Change at 0.488. Four competencies were strongly correlated, with scores ranging from 0.535 to 0.598. Business Acumen was related at 0.535 and Customer Focus at 0.565. Innovation scored at 0.574 and Strategic Perspective came in with the highest correlation at 0.598.

Customer Focus had nine companion competencies. Five competencies were correlated, with scores ranging from 0.404 to 0.499. Communication was related at 0.404 followed by Taking Responsibility at 0.477, Dealing with Change at 0.463, Decision Making at 0.494, and Innovation at 0.499. Four competencies reflect correlation at scores of 0.517 to 0.577. Collaboration and Teamwork was related at 0.517 followed by Business Acumen at 0.531 and Results at 0.565. Strategic Perspective had the highest correlation at 0.577.

Strategic Perspective had ten companion competencies per statistical result ranging from 0.421 to 0.633 in score range. Three competencies correlated with scores of 0.421 to 0.499. Developing Self and Others was related at 0.421, Taking Responsibility at 0.426, and Building Relationships at 0.499. Five competencies had strong statistical score ranges between 0.515 to 0.598. Collaboration and Teamwork correlated at 0.515, Business Acumen at 0.541, Dealing with Change at 0.558, Customer Focus at 0.577, and Results at 0.598. Two competencies had the highest correlation of 0.600 or above. Decision Making scored at 0.610, and Innovation came in with the highest correlation at 0.633

The Innovation competency had nine companion competencies ranging from 0.449 to 0.633. Five competencies were correlated with scores ranging from 0.449 to 0.499. Taking Responsibility was related at 0.449, Dealing with Change at 0.463, Building Relationships at 0.473, Collaboration and Teamwork at 0.483, and Customer Focus at 0.499. Three competencies had strong statistical correlation scores between 0.574 to 0.591. Results correlated at 0.574, Decision Making at 0.577 and Business Acumen at 0.591. Strategic Perspective had the highest correlation at 0.633.

Table 7. Sandia Success Profile Companion Competencies

	Business Acumen	Results	Customer Focus	Strategic Perspective	Innovation	Dealing with Change	Taking Responsibility	Decision Making	Developing Self and Others	Building Relationships	Collaboration and Teamwork	Diversity and Inclusion	Communication
Business Acumen													
Results	0.535												
Customer Focus	0.531	0.565											
Strategic Perspective	0.541	0.598	0.577										
Innovation	0.591	0.574	0.499	0.633									
Dealing with Change	0.433	0.488	0.463	0.558	0.463								
Taking Responsibility	0.387	0.277	0.447	0.426	0.449	0.441							
Decision Making	0.503	0.386	0.494	0.610	0.577	0.492	0.565						
Developing Self and Others	0.292	0.290	0.363	0.421	0.365	0.474	0.400	0.492					
Building Relationships	0.460	0.445	0.353	0.499	0.473	0.388	0.330	0.437	0.389				
Collaboration and Teamwork	0.405	0.444	0.517	0.515	0.483	0.531	0.620	0.500	0.625	0.452			
Diversity and Inclusion	0.301	0.168	0.361	0.318	0.325	0.372	0.625	0.428	0.488	0.362	0.633		
Communication	0.257	0.208	0.404	0.315	0.289	0.395	0.516	0.470	0.365	0.199	0.544	0.472	
Sandia Values	0.340	0.280	0.343	0.300	0.254	0.353	0.369	0.277	0.240	0.303	0.463	0.378	0.388
	0.600-1.000 Highest Correlation		0.500- 0.599		.400- 0.499		0.300- 0.399		0.200- 0.200		0.100-0.199 = Lowest Correlation		

Survey results highlight a strong correlation between all competencies within the Leadership category. Dealing with Change had nine companion competencies, with statistical scores ranging from 0.433 to 0.558. Seven competencies were correlated, with scores ranging from 0.433 to 0.492. Business Acumen was related at 0.433 followed by Taking Responsibility at 0.441. Customer Focus and Innovation scored at 0.463 followed

by Developing Self and Others at 0.474, Results at 0.488, and Decision Making at 0.492. Two competencies had higher correlation with this competency. Collaboration and Teamwork at 0.531 was next to the highest with Strategic Perspective at the highest correlation at 0.558.

Taking Responsibility had nine companion competencies. Statistical scores ranged between 0.400 and 0.625. Five competencies were correlated with scores ranging from 0.400 to 0.449. Developing Self and Others correlated at 0.400, Strategic Perspective at 0.426, and then Dealing with Change at 0.441. Customer Focus correlated at 0.447 followed by Innovation at 0.449. Communication at 0.516 and Decision Making at 0.565 had higher statistical correlation. Collaboration and Teamwork at 0.620 and Diversity and Inclusion at 0.625 scored at the highest correlation level.

Decision Making had eleven companion competencies, with scores ranging between 0.428 and 0.610. Six competencies were correlated, with scores between 0.428 and 0.494. Diversity and Inclusion was correlated at 0.428, followed by Building Relationships at 0.437. Communication correlated at 0.470 and Dealing with Change and Developing Self and Others at 0.492, followed by 0.494 for Customer Focus. Four competencies had higher correlations, ranging between 0.500 and 0.577. Collaboration and Teamwork correlated at 0.500, Business Acumen at 0.503, and Taking Responsibility at 0.565, followed by Innovation at 0.577. Strategic Perspective had the highest correlation, at 0.610.

Survey results highlight correlations between all competencies within the Leadership category. Developing Self and Others had six companion competencies with scores ranging from 0.400 to 0.625. Five competencies were within the 0.400 to 0.492 range. Taking Responsibility correlated at 0.400, followed by Strategic Perspective at 0.421. Dealing with Change correlated at 0.474, Diversity and Inclusion at 0.488, and Decision Making at 0.492. Collaboration and Teamwork had the highest correlation at 0.625.

Building Relationships had six companion competencies, with correlations ranging between 0.437 and 0.499. Decision Making correlated at 0.437, followed by Results at 0.445. Collaboration and Teamwork correlated at 0.452, followed by Business Acumen at 0.460 and Innovation at 0.473. Strategic Perspective had the highest correlation at 0.499.

The Collaboration and Teamwork competency had strong correlations between all the other competencies per statistical results ranging from 0.405 to 0.633. Five competencies were within the 0.405 to 0.483 range. Business Acumen correlated at 0.405. Results at 0.444 was closely followed by Building Relationships at 0.452, Sandia Values at 0.463, and Innovation at 0.483. Five competencies had higher statistical scores, ranging between 0.500 to 0.544. Decision Making correlated at 0.500, Strategic Perspective at 0.515, Customer Focus at 0.517, Dealing with Change at 0.531, and then Communication at 0.544. Three competencies had the highest correlation of 0.600 or above. Taking Responsibility at 0.620 was followed by Developing Self and Others at 0.625. Diversity and Inclusion had the highest correlation at 0.633.

Diversity and Inclusion had five companion competencies per statistical result, ranging from 0.428 to 0.633. Decision Making correlated at 0.428, Communication at 0.472, and Developing Self and Others at 0.492. Two competencies had the highest correlation of 0.600 and above. Taking Responsibility correlated at 0.625, with Collaboration and Teamwork at 0.633.

Communication had five companion competencies. Statistical scores ranged between 0.404 to 0.544. Customer Focus correlated at 0.404 and Decision Making at 0.470, followed by Diversity and Inclusion at 0.472. Two competencies had the highest correlation. Taking Responsibility scored at 0.516 and Collaboration and Teamwork at 0.544.

Sandia Values had one companion competency. Collaboration and Teamwork correlated at 0.463.

Hypothesis 2 – Research Question #3 Analysis

The third research question associated with Hypothesis 2, for leaders with competency scores at or above the 90th percentile, contrasted results in the Mission Success and Interpersonal Skills categories. Zenger & Folkman's 2002 research concluded that leaders with a relationship between these two categories are the most successful ones in their organizations. Having good interpersonal skills reinforces technical capabilities as these leaders tend to reinforce their technical skills through mentoring and enhanced communication. They also found that individuals with strengths in these two categories performed their work in a manner that contributed to the overall organization through maximizing their networking and getting work done through others. Zenger & Folkman stated that "having strong interpersonal skills facilitates the sharing of knowledge, the persuasion of others to a new position, and positive interactions in terms of solving problems" (2002, p. 187).

There are five competencies under the Mission Success category. They are Results, Strategic Perspective, Innovation, Business Acumen, and Customer Focus. The Interpersonal Skills category has four competencies. The four related competencies are Building Relationships, Diversity and Inclusion, Collaboration and Teamwork, and Communication.

To determine results in the Mission Success and Interpersonal Skills categories, the 529 individuals with at least one competency at or above 90th percentile were assessed. The scatter plot cited in Figure 20a compares scores for these two categories. Each scatter plot has a line drawn at $y=x$. Data values above the line represent individuals with final scores that were larger than their initial scores. Data values below the line represent individuals with final scores that were less than their initial scores. The mean score for the Mission Success category was 83.7 and 84.6 for the Interpersonal Skills category. Figure 20b is a histogram highlighting the comparison differences between these two categories.

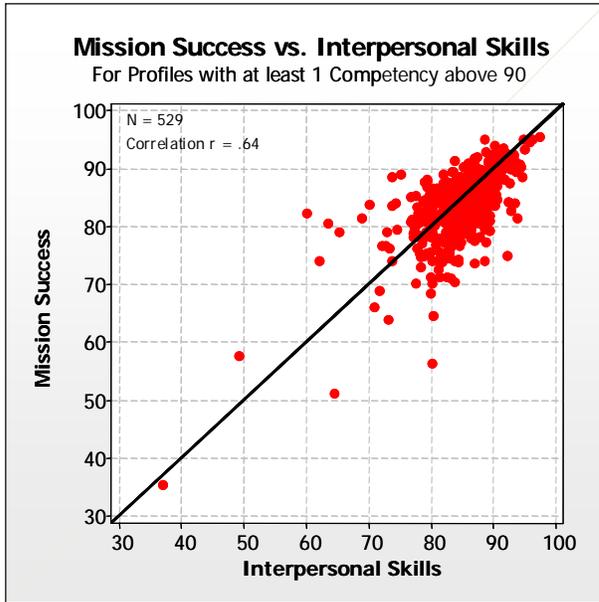


Figure 20a. Comparison Scatter Plot of Mission Success and Interpersonal Skills Categories



Figure 20b. Comparison Histogram of Mission Success and Interpersonal Skills Categories

A Pearson correlation coefficient analysis identifies the degree of relationship between two variables with the value ranging from -1 to $+1$. A -1 demonstrates a perfect negative correlation and $+1$ demonstrates a perfect positive correlation. Values near zero indicate little relationship, either negative or positive, between the two variables. A correlation p -score of .4 or higher was used to define a relationship between the two categories. The strong correlation of $p=0.64$ between these two categories supports the hypothesis that individuals who scored high for Mission Success also tended to score high in the Interpersonal Skill category.

Recommendations for Future Study

There are several potential future studies derived from this study. This study highlighted the existence of limited documentation for leader indicators at Sandia. Further work needs to be done to ascertain those leader indicators that logically fit with future organizational needs.

This study highlighted limited documentation on employee retention, engagement, and commitment in relation to the 360-degree success profile assessment. It would be interesting to conduct an analysis of those leaders who scored at or above the 90th percentile and then compare them for potential relationships to organizational effectiveness as evidenced by keeping and retaining staff, having a strong strategic focus, better communication, a clear future vision, and effective delivery of organizational results. This study focused on 14 competencies of the 15 Success Profile Competency set. The Professional/Technical Expertise competency was excluded due because sufficient data were not available since it came into existence in 2002. Future study consideration would be to conduct this study again once data exist on this Success Profile Competency.

Another good question for further investigation would be to ascertain if a statistical significance exists between those competencies that leaders choose to include on their action plans and the overall initial-to-final results for the Success Profile Competencies.

Business Acumen is considered an important organizational competency, as evidenced by the statistically significant difference on the initial-to-final scores on the success profile assessment tool. A future study consideration would be to explore what might be the cause of why this competency had only 52 individuals at or above the 90th percentile score range.

SUMMARY

Sandia is in the forefront for leadership development as it continues to focus on making connections between mission success, leadership, interpersonal skills and what is core to the organization and its people. The data in this study support that the 360-degree Success Profile Competency set has made an organizational difference. The data indicate that leadership capabilities have improved from the initial to the final assessment scores. Based on 360-degree feedback, the presence of high performing leaders is shown to statistically exist at Sandia.

Today is truly an exciting time for leaders as the world continues to undergo change. Sandia's life-long-learning philosophy is essential to support change. The use of a 360-degree assessment and associated action plan can assist leaders in understanding and connecting from where they are to where they need to be in terms of what is important to the organization. Goldsmith (1996, p. 229) says it well by stating, "The leader who cannot keep learning and growing will soon become obsolete in tomorrow's ever-changing world."

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