

# Leadership Skills Valued by Project Engineers

Mark Gillaspie, MaryEllen C. Nobe, Ph.D., and Rodolfo Valdes-Vasquez, Ph.D.  
Colorado State University  
Fort Collins, CO

Many companies are struggling with finding enough employees to meet their demand while also retaining the employees they currently have. The purpose of this study is to identify if there is a correlation between the application of the 12 Pillars of Effective Supervision (Rojas, 2013) and employee retention rates. A survey was developed for this study based on the 12 Pillars of Effective Supervision identified by Rojas (2013) and was administered to the employees of a large commercial construction company. This study found a significant correlation between the 12 pillars of effective supervision and the 2-year career intentions of Project Engineers; however, not all of the correlations were in the direction expected. 'Humility', 'commitment', 'effectiveness', and 'willingness' were negatively correlated with employees' 2-year career intentions, although only 'humility' and 'effectiveness' were statistically significant. These results suggest that these elements of the 12 pillars have a negative impact on employee retention, which contradicts the assumption that effective leadership will be positively correlated with employee retention rates. Due to the small sample size of this study, further investigation is needed to fully understand the complexity of Rojas' 12 Pillars and employee retention in the commercial sector.

**Key Words:** Leadership, Project Engineer, Career Intentions, Job Site Management, Retention

## Introduction

Employee retention is not a new problem in the construction industry (Miodonski, 2004; Brandenburg, Haas & Byrom, 2006); however, it has taken on a new significance in the years since the recession (Schultz, 2013). As construction has recovered from its lows during the recession, many companies are struggling with finding enough employees to meet their demand. This has resulted in ample opportunities for construction professionals to move between companies, creating a challenge for companies that are struggling to remain competitive. Employees' supervisors have an impact on retention rates of employees and provide a possible solution to addressing retention issues.

The construction industry is very competitive and demanding; keeping workers employed is vital to a company's success (Nkomo & Thwala, 2009). Poor retention rates not only impact employee turnover, but also impact productivity and client retention while increasing the costs for recruiting, hiring, and training new employees (Smither, 2003). The result is a decrease in profitability. To increase employee retention, it has been suggested that construction managers need to evolve past merely overseeing from a distance to become facilitators, even going so far as to view workers as supervisors' clients instead of as their employees (Rojas, 2013). Others have stressed the importance cultivating autonomy by giving workers and junior managers more creative control while still ensuring that company and job site objectives are met (Forni, 2013). In a related study, it was found that construction employees often perceive their employers as lacking in terms of communication skills, providing feedback, developing learning cultures, providing mentoring and/or employee engagement (Nkomo & Thwala, 2009). As a result, the authors of this study suggest that employees will be more likely to leave their current employer for one that they perceive as doing a better job in these areas (Nkomo & Thwala, 2009). This trend has been noted in the U.S. by staffing who are seeing an increase in the amount of clients that are already employed but who are seeking new opportunities (Schultz, 2013). The purpose of this study is to investigate what impact supervisors have on retention rates by investigating correlations between employees' perceptions of their supervisors and their career intentions.

### *Research Questions*

The purpose of this study is to identify if there is a correlation between the application of the 12 Pillars of Effective Supervision (Rojas, 2013) and retention rates. The research questions guiding this study are:

1. Does a correlation exist between the 12 Pillars of Successful Supervision and Project Engineer retention rates?
2. Which of the 12 Pillars of Successful Supervision has the highest correlation with retention rates?

A positive correlation is expected to exist between Project Engineers' perceptions of their supervisor and their intention to remain employed with their current company.

### **Literature Review**

Retaining good employees is vital to a company's long-term success. This fact is specifically important in the construction industry where there are tight job markets and fierce competition for uniquely skilled and knowledgeable workers (Nkomo & Thwala, 2009). For a construction company, two things primarily make the company what it is: the product it puts out, and the people it employs. Miodonski (2004) notes that in any field, a company's competition can copy everything including equipment, advertising, job location, etc., but the one thing that they don't have is the people; a company's people are what make the difference.

Human interaction is an important part of any business; especially in the construction industry where the face-to-face relationships between owner, contractor, and employee are vital to not only ensuring an impressive final product, but also ensuring relationships between managers and employees stays positive and beneficial to both parties. This is known as balancing organizational development (what benefits the company) with workforce development (what benefits the employees) (Margolis, 2012). Organizational development is defined as building the capacity of the company, or the business side of the things. Workforce development is defined as building the employees up as a part of the company, or the human element of a business. The question is, what should development professionals focus on, organizational or workforce development? According to Margolis (2012), is not possible to have one without the other. The important aspect to remember here is that there cannot be a successful company without successful employee / employer relations and retaining employees through proper management is key to this effort. High employee turnover will stifle workforce development and the success of the company will be marginal at best. Margolis explains that a good leader will employ his workers' fundamental motivation to improve and develop personally while simultaneously aiding in the progression of the organization's goals and efforts. Margolis uses the residential construction as an example. The goals and efforts are to build an efficient, impressive home that fits the exact needs of the owner while also building a name for the contractor's company. If the contractor is successful, it is in part due to the success of the management of their employees and sub-contractors and if they are given credit for the success of the product, then their reputation builds as well. This combination of contractor / subcontractor only helps to improve their working relationship is the best way to combine organizational and workforce development for both parties. A company that promotes a workforce that is encouraged, happy and open will most likely be successful (Margolis, 2012).

Nkomo and Thwala (2009) conducted a study to investigate the experiences, challenges, and problems contributing to the retention of employees within various construction companies. The objective of their research was to investigate the causes of the job hopping, identify current retention studies, determine the cost of job hopping to the employer, and to develop a retention strategy for the construction industry. Their study, conducted in South Africa, provided a special focus on human resource management and leadership. Their data was mainly qualitative and was based on content analysis, case studies and historical data. They also collected data from interviews with 20 employees who worked within the construction industry in Gauteng Province in South Africa. Although this study was conducted outside the United States, it is included in this review because of the similarities the two possess. Based on their study, Nkomo and Thwala identified the following costs of poor retention rates and the development of what they felt were strategies management could use to specifically mitigate poor retention and prevent those costs:

- Leaving costs – payroll personnel administration costs

- Direct cost of recruiting replacements (advertising, interviewing, testing, etc.)
- Direct cost of training replacements in the necessary skills
- Direct cost of introducing replacements (induction courses, costs of manuals, etc.)
- Opportunity cost of time spent by HR and line managers in recruitment
- Opportunity cost of time spent by HR and managers in introducing new starters
- Opportunity cost of time spent by line managers and other staff in providing training
- Loss of the input from those leaving before they are replaced in terms of contribution, output, sales, customer satisfaction and support, etc.
- Loss arising from reduced input from new starters until they are fully trained

Nkomo and Thwala (2009) also note that when employees move from one company to the next, it can also have a negative effect on the company's morale which can lead to poor productivity and lost profits. Individually, these costs may not seem to be much, but when all the little aspects are added up, they amount to large financial costs. Many of the costs can be quantified after the employee works for the company for a considerable amount of time and the company makes their "return" back from the work the employee completes (Nkomo et al, 2009). But when an employee leaves a company after only a short time, although it is difficult to assign a specific value to the loss, it is clear that the company's productivity has been impacted.

A study conducted by Rojas (2013) provides additional insight into key traits of successful supervisors and project managers. Rojas conducted a study of 52 individuals ranging from electricians, craftsmen, foreman, laborers, construction company owners, etc. They were brought together in focus groups and interviews in order to better understand issues related to recruitment and retention of field supervisors in the construction industry. The goal of the focus groups was to gain information on the ideal competencies a project manager should have and the goals of interviews were to better identify how those competencies could be applied to recruit and retain quality project managers. In order to get a diversity of opinions, the interviews were conducted in several cities ranging from Seattle, WA to Atlanta, GA. Open-ended questions were used to solicit subjects' views, opinions and comments regarding the issues. In this study, Rojas (2013) used an altered 360-degree performance evaluation to for data collection. A typical 360-degree performance evaluation means that evaluations of the employee come from their own ratings as well as the ratings of their supervisors, peers, and even subordinates. For this study, Rojas applied this approach to supervisor competencies. For example, in order to assess an electrical field supervisors' ideal competencies, individuals working in that position as well as their electrician employees, project manager, and company executives were all interviewed. During both the focus groups and interviews, several themes surfaced regarding the ideal competencies of the modern supervisor and project manager. These themes were then divided into 12 pillars (Rojas, 2013): Humility, Character, Leadership, Consistency, Commitment, Curiosity, Communication Skills, People Skills, Effectiveness, Knowledge, Experience, and Willing. Rojas' study focused primarily on the unionized electrical construction sector and, therefore, it is not directly generalizable to the construction industry. However, as pointed out by Rojas, the tools introduced in this research could help recruiters and career managers become more efficient in any construction field.

## **Methodology**

### *Research Design and Instrument Development*

This quantitative case study addresses the correlation between the 12 Pillars of Effective Supervision established by Rojas and Project Engineers' career intentions. This quantitative method offers several advantages to this exploratory study. Primarily, the data collected about the Project Engineer's perception of how effective their supervisor is at applying the strategies outlined in the 12 Pillars as well as the amount of time those Project Engineers plan on staying employed at their company can both be quantified and measured. The primary instrument for establishing this data was an internet-based survey. The survey was designed to take approximately 20 minutes to complete. The purpose of the survey was (1) to collect project engineers' perceptions of how effective their supervisors are at applying the 12 Pillars as identified by Rojas and (2) their future career intentions.

The survey was administered to employees of a large commercial construction company that were currently (or have been previously) employed as a field engineer. A link to the survey along with a recruitment script explaining the purpose of the study was sent to company employees by the company's human resource department. No personal

information that could be used to identify the participants was collected. Participation was completely voluntary and participants could stop participating at any time during the survey. Fifty-six completed surveys were returned.

### *Survey Development*

Rojas' 12 Pillars of Effective Supervision were used as the basis for the development of the Likert-scale questions that were used to determine Project Engineers' perception of how effective their supervisors are at applying the strategies outlined in the 12 Pillars.

The research team for this study took the information contained in each of the pillars from Rojas' article and first put them into bullet point form with an average of three to six bullets for each pillar (at the start some had two, some had seven). Because Rojas obtained the information in his article through interviews and focus groups in the unionized electrical construction sector, the research team had to pick out specific information from the article and tweak it slightly to fit the project engineer focus of this study. These 12 pillars, along with their bullet points, then began to form the basis for the section of the survey that would evaluate the project engineer's opinion of their supervisor's competency.

The final survey consisted of a total of 35 questions broken down into three separate sections plus a short block of instruction at the start. The instructions section had a couple components that were key to directing the participants as they took the survey. First, it instructed them to reference their current or most recent supervisor when responding to the questions. Secondly, if the participants were not currently in the role of project engineer but had been in the past, they were instructed to answer the questions as if they were still in that role. These specific instructions, along with some standard quantitative survey instructions, helped to narrow down the response to the specific niche that this study was focused on and prevented data from being unusable. For example, the data would be unusable if a participant was currently in the project manager role and chose to answer the questions in response to their construction manager supervisor. Or if a participant was currently in the project engineer role and chose to respond to the questions in regards to a manager they may have had a couple years past, those responses would not necessarily correlate with their current decisions to stay employed with that company. Although in both cases that information could be useful, it would not fit the specific needs of this survey, and therefore, would not be usable data.

The first section consisted of demographic questions to better identify the participant. The questions consisted of age, gender, level of education, race, current role and length of time in that role, as well as a question asking whether the participant had ever been in the project engineer role. This is important to know early in the survey because if the participant had not been in the project engineer role, then their responses would not be needed and the online survey was designed to end if they answered, "no" to this question.

The second section consisted of the bulk of questions regarding how well participant felt their supervisor was at applying key aspects of the 12 pillars of supervision established in the Rojas article. In order to break up this large block of questions, the section was divided into four parts. Three of those parts consisted of questions eliciting participant responses about four of the pillars each and the fourth part were additional questions relating to supervisor abilities created by the research team. The fourth part of section two also asked demographic questions about the participant's supervisor.

The final and third section consisted of questions regarding the participant's future employment plans. There was one section with Likert-scale questions gauging how satisfied the participant was about their current position. There were also several questions asking the participant to list (in order) what their top reasons would be for leaving their current company as well as the top reasons would be for remaining at their current company. The final two questions in the survey were designed to gauge exactly how long the participant planned on staying employed with their company and employed in the construction industry as a whole.

The overall goal of the survey was to help identify the correlation between the participant's opinion of how well their supervisor was at applying key aspects of the 12 pillars of effective supervision and their intention on staying employed with their company and in the construction industry in general. The hope was to see how the answers to the competency questions listed in section two related to the career goal questions in section three. For example, if a participant answered "strongly disagree" or "disagree" with many of the Likert-scale supervisors competency

questions, that would imply that they feel their supervisor is not effective at managing or is perhaps not a competent leader. This would then correlate with the participant answering questions in the career goal section that imply they are planning on leaving the company or the construction industry within a short period of time. The same correlation could go the other way as well. If the participant answered “strongly agree” or “agree” to many of the competency questions, then the hope was to see their answers in the career goal section would imply that they enjoy their current position and plan on staying with their current company for an extended period of time.

## Results

After opening up the online survey for a total of four weeks, 56 people opened the survey. Out of those 56, nine only previewed the survey but did not actually participate leaving a total of 47 participants. Out of those 47 participants, 39 answered, “yes” to the “Have you ever been in the Project Engineer Role?” question. In addition, one participant commented that their answers might be slightly skewed because they answered the questions from the supervisor role and not from the Project Engineer role. This is important because, for this survey, only the opinions of current or past Project Engineers were sought. The total sample size for the research was 39 participants. Table 1 provides demographic data for the population.

Out of the 38 participants who answered the gender question; there were 32 males and only six females, which is not surprising in the commercial construction industry. Ages ranged from 23 to 55 with an average age of 31. Sixty-seven percent were between 22 and 34 years old and 52% had been at the company less than two years, both of which are also not surprising due to the fact that being a Project Engineer is an entry level position and most employees are put in that position straight out of college. A total of 97% of the participants had, at least, a Bachelor’s degree with 15% of those also possessing a Master’s degree. Forty-one percent of the participants indicated that they had worked for three other companies.

Variables used to answer the research questions were the 12 Pillars Indexes and participants’ future career intention. The number of survey items used to create the indexes ranged from 3 to 5 survey items. Internal consistencies of the survey items for each scale were examined using Cronbach’s alpha reliability coefficients (Vaske, 2008; Nobe, 2007). Based on the reliability analysis, some questions were deleted from the scales. Regression analysis was used to analyze the data from the survey to help better understand the correlation between the 12 pillars of effective supervision and Project Engineer career intentions. Results of the regression analysis are provided in Table 1. Overall, the regression model was significant at the  $p < .10$  level, which was selected due to the small sample size (Vaske, 2008). Combined, the 12 Pillars are significant predictors of individuals’ 2-year career intentions. These results supports the assumption that employees have a lower perception of their supervisor’s management skills will be less likely to remain employed with their current company (Nkomo & Thwala, 2009).

Table 1

Regression analysis summary for 12 Pillars and Career Intentions

Variables	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
Humility	-0.79	0.27	-0.88	-2.95	0.01
Character	0.14	0.34	0.11	0.42	0.68
Knowledge	0.28	0.37	0.20	0.75	0.46
Leadership	0.48	0.47	0.38	1.01	0.33
Consistency	0.27	0.30	0.26	0.91	0.38
Commitment	-0.25	0.33	-0.20	-0.77	0.45
Curious	0.57	0.20	0.73	2.87	0.01
Communication	0.38	0.25	0.38	1.48	0.16
People Skills	0.01	0.30	0.01	0.02	0.99
Effectiveness	-0.82	0.36	-0.70	-2.29	0.04
Experience	0.18	0.16	0.24	1.16	0.26
Willingness	-0.11	0.41	-0.08	-0.27	0.79

Note.  $R^2 = .61$  ( $p < .10$ )

The pillars that have the largest correlation with employees' 2-year career intentions are 'humility', 'curious', and 'effectiveness'. An unexpected finding was that some of the pillars (humility, commitment, effectiveness, and willingness) were negatively correlated with employee's 2-year career intentions. Even though not all of these relationships were statistically significant, these results warrant further investigation to better understand the reason for the negative relationship. It is particularly interesting that 'humility' ( $\beta = -0.88, p < .10$ ), which is generally considered to be an admirable trait, and that has the largest statistically significant beta is negatively correlated with individuals' 2-year career intention. This result suggests that the higher the Project Engineers rated their supervisor on humility, the less likely they are to remain with their current employer. 'Curious' ( $\beta = 0.73, p < .01$ ) and 'effectiveness' ( $\beta = -0.70, p < .05$ ) are the other two pillars that also have a statistically significant predictors of employees' 2-year career intention. Again, it is worth noting that 'effectiveness' is negatively correlated with career intention. In contrast to 'humility' and 'effectiveness', 'curiosity' also had a significant impact on career intentions but its impact was positive meaning that higher the participants ranked their supervisor on 'curiosity', the more likely they were to stay employed with their current company. These results warrant further investigation to validate these findings. If validated, these findings would support the assumption that 'humility', and 'effectiveness' are significant predictors of 2-year career intentions, but not in the direction expected. The pillars that were the least significant and had the smallest correlations with employees' career intentions are 'character', 'people skills', and 'willingness'. Again, this is an unexpected finding as these are generally considered to be important traits for anyone in a management position.

In order to properly identify what reasons influence Project Engineers' decision to either leave or stay at their current place of employment, the participants were asked to rank the top ten reasons why they would either leave or stay at their current job. The mean responses are presented in Table 2.

Table 2

Reasons to leave or stay with their current employer	
Reasons for Leaving	Mean Response
Poor balance between work time and personal time	2.32
Don't feel engaged or appreciated	2.18
Lack of opportunity for advancement	2.11
Lack of job satisfaction	1.75
Poor corporate culture/work environment	1.71
Not enough pay	1.57
Poor working relationship with supervisor	1.39
Long drive time to work	0.93
Not enough benefits	0.50
Other	0.00
Reasons for Staying	Mean Response
Positive corporate culture/work environment	3.85
Job satisfaction	2.07
Always feel engaged or appreciated	1.89
Plenty of opportunity for advancement	1.67
Equal balance between work time and personal time	1.63
Satisfied with pay	1.37
Positive working relationship with supervisor	1.37
Good company benefits	0.78
Short drive time to work	0.37
Other	0.00

Based on these responses, the working relationship with their supervisor is one of the least important reasons for either staying or leaving their current employer. This result is likely due to the fact that in a large company there are ample opportunities for working with different supervisors.

## Discussion and Conclusions

This study found a significant correlation between the 12 pillars of effective supervision and the 2-year career intentions of Project Engineers, however, not all of the correlations were in the direction expected. 'Humility', 'commitment', 'effectiveness', and 'willingness' were negatively correlated with employees' 2-year career intentions, although only 'humility' and 'effectiveness' were statistically significant. These results suggest that these elements of the 12 pillars have a negative impact on employee retention, which contradicts the assumption that effective leadership will be positively correlated with employee retention rates. Due to the small sample size of this study, further investigation is needed to fully understand the complexity of Rojas' 12 Pillars and employee retention.

Rojas' research goal was to identify what characteristics make up a competent leader and his results were the 12 Pillars which, when looked at and even studied in depth, do seem to represent those competencies. In this study, however, this correlation only exists between four of the 12 pillars. A possible reason for this contradiction in findings could be that the information pulled from the Rojas article and used for the development of the Likert-scale questions was altered slightly to fit the concept of Project Engineers in the commercial construction industry.

Another possible explanation for the differences between this study and the study conducted by Rojas is that population was chosen for the research. Where this study was conducted specifically on current Project Engineers or those that had served in that position in the past in the commercial construction industry, the Rojas study was conducted on a wide variety of employees in the electrical construction industry to include workers, supervisors, managers, presidents, and owners. While the industry chosen may not necessarily affect the difference in results, the choice of participants might have had an impact. Because Rojas chose such a variety of participants at different levels of the supervisor chain, he was able to gather opinions of what makes a good supervisor from a broader scale, not just from a single group. What a worker feels on one end of the chain and what a company vice-president feels at the other end what qualities makes an effective supervisor may actually be in conflict. This difference in participant positions could have played a significant role in why there were only four out of 12 Pillars with direct correlation with employees' career intentions.

For the purpose of this study, the following limitations and assumptions were acknowledged. First, the participants of the survey used were limited to current and former project engineers at a specific commercial construction company. Second, the survey instruments used in this study were created solely by the research team based on literature reviews of similar topics as well as previous research conducted by the team on similar topics. Third, this study was limited by the degree of reliability and validity of the survey instrument. Fourth, it was assumed that the participants of the survey were honest in their responses and correctly understood the survey instrument itself. Fifth, it was assumed that participants based their responses on their own experiences.

## References

- Brandenburg, S. G, Haas, C. T. and Byrom, K. (2006). "Strategic Management of Human Resources in Construction." *Journal of Management in Engineering*, 22 (1), p7.
- Forni, A. (2013). "Finding your natural motivation." *Consulting-Specifying Engineer*, 50 (7), p1.
- Johnson, B. (2010). "Employee Retention During an Economic Downturn." from <http://www.constructionbusinessowner.com/topics/strategy/construction-company-management/employee-retention-during-economic-downturn>.
- Margolis, D. (2012). "See the Forest for the Trees." *Chief Learning Officer*. 11 (6), p3.

Miodonski, B. (2004). "Retaining good employees starts at the top." *Contractor Magazine*, 51 (10).

Nkomo, W., and Thwala, W. D. (2009). "Problems Facing Construction Companies in Retention of Employees in South Africa: A Case Study of Gauteng Province." *Construction Industry Development Board Paper 22*. Postgraduate Conference on Construction Industry, Development, Johannesburg.

Nobe, M. C. (2007). "Values and Construction Waste Recycling: An Application of the Cognitive Hierarchy to Construction Management Education (Doctoral Dissertation)." Colorado State University, ProQuest Dissertations Publishing.

Schultz, B. (2013). "Time to Focus on Worker Retention." from <http://www.forconstructionpros.com/blog/10857670/time-to-focus-on-worker-retention>.

Smither, L. (2003). "Managing Employee Life Cycles to Improve Labor Retention." *Leadership and Management in Engineering*, 3 (1), p5.

Rojas, E. M. (2013). "Identifying, Recruiting, and Retaining Quality Field Supervisors and Project Managers in the Electrical Construction Industry." *Journal of Management in Engineering*, 29 (6), p11.

Vaske, Jerry J. (2008). *Survey Research and Analysis: an Application in Parks, Recreation and Human Dimensions*. Venture Publishing, Inc., State College, PA.