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Managerial Workforce Development and Economic Competitiveness

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Abstract

Major transportation companies invest millions of dollars in an attempt to improve the competencies and overall job performance of managers and company leaders in an effort to enhance economic competitiveness and to provide a greater return on investment (ROI) to shareholders and stakeholders. The present research investigated a managerial development training program designed to improve managerial effectiveness. Following a review of the literature it was determined that there are a number of different approaches that are in use today to enhance managerial effectives. However, few if any metrics or assessment tools exist to measure and ultimately quantify the impact of these interventions on overall job performance and ultimately ROI. A performance measure and assessment tool calibrated with increasing levels of managerial effectiveness was also developed for industry wide use. The assessment tool was developed with the intention of being able to be used in various organizations to assess managerial effectiveness. Scores of the measure could also be used as a metric for estimating performance effectiveness and performance. The measurement tool for assessment managerial effectiveness and competency was devised for and implemented with a sample of directors for a large transportation company. Based on analysis of the data it was determined that a corresponding indicator of job performance, annual salary, was appropriate as a metric to establish job performance and ROI outcome data. Analytics for human resource utility analyses of job performance were approximated and calibrated and a standardized metric derived. Subsequent analyses revealed performance improvement of nearly half a million dollars in annual salary. Thus the return on investment was estimated at 17% improved performance.

The study design and analytical techniques utilized demonstrate an effective method for estimating the return on investment for managerial effectiveness training using appropriate metrics, measurement tools and analytical algorithms.

Table of Contents

List of Figures

List of Tables

Managerial Workforce Development
and Economic Competitiveness

1   Introduction

Previous work has identified a set of managerial and leadership competencies needed for success in the transportation industry. These leadership competencies are extremely relevant to overall economic competitiveness. Since, in the transportation industry all of the players are using the same basic tools and techniques the importance of successfully managing, motivating and leading the personnel that are assigned to them is extremely critical. Consequently, when it comes to making significant economic improvements that will drive competitiveness across the industry the essential component that is often overlooked is the role of leadership.

It seems companies are spending more time and money today than ever on leadership development systems to place themselves ahead of the competition and establish a competitive advantage through highly effective leadership (Boyatzis & Saatcioglu, 2007). The use of managerial and/or leadership competency systems has become the gold standard design to improve leadership performance (Boyatzis & Saatcioglu, 2007). Most organizations rely on competency-based assessment tools to select, train, promote, and reward managers (Boyatzis, 2007).

Recent research also showed that the specific core competencies essential for successful performance are partially influenced by industry context (Brownell, 2008). This conclusion comes following years of leadership and management research that has failed to agree upon one essential set of core competencies that ensure success across industry lines (Brownell, 2008). As a result, more studies are beginning to emerge that focused exclusively on applying general managerial/leadership competency research to the development of sophisticated assessment instruments for specific industries (Calhoun et al., 2008). This is a relatively recent trend, and despite widespread use of competencies as performance

criteria, certain key industries remain without psychometrically sound managerial competency scales. Many industries rely on outdated and invalid instruments (Tett et al., 2000). Transportation is one industry lacking a sophisticated and accurate managerial competency scale, while also facing increased need for services amidst workforce development shortages at all levels of management (Vogel, 2001). Few studies, if any, have focused exclusively on the development of a psychometrically sound managerial competency scale for transportation outside of corporate America. There are several reasons why transportation is an ideal industry for such a project.

As the demand for transportation continues to increase dramatically amidst the current population boom and reliance on transportation services grows, an estimated 40 to 50 % of the existing local, state, and federal transportation workforce near retirement (Martin, 2001). These baby boomers lead at all levels of the transportation industry and little workforce development planning has been done to prepare for the future shortage of competent managers (CTC & Associates LLC). Sen. George Voinovich, R-Ohio estimated that by 2010 approximately 600, 000 employees will retire (U.S. Dept. of Transportation). Further, the Federal Highway Administration (FHWA) reported that 45 % of its workforce will be eligible to retire in 2010 (Martin, 2001). Despite workforce development challenges amidst increasing demand for services, the transportation industry remains without a valid managerial competency scale. A psychometrically sound behavioral competency instrument tailored to transportation could help the industry establish training, recruiting, and managing practices that meet the demands of these future shortages of competent leaders at all levels of management. Establishment of a competency assessment tool for transportation managers that is based on newer approaches to scale development would greatly increase the likelihood of a smooth transition from the current aging management body by validly identifying the core competencies responsible for successful leadership in transportation. Using advanced methodology and analysis in scale development, the purpose of this study was to develop a core managerial competency scale that lists leadership competencies in terms of difficulty so that it can be used to effectively recruit, select, train and reward transportation leaders by identifying leader abilities.

There are several societal and economic reasons to focus on leadership performance (Levenson et al., 2006), especially in transportation. Indeed, one does not have to look too far to see how costly poor selection and training procedures can be to organizations and the nation as a whole. The press is quick to announce executive scams and failures, which have been regularly seen in recent years. In the transportation industry, the cost of safety mishaps has led to the downfall of transportation agencies and entire modes of transportation, as well as eroded the trust

of the public while leading to substantial loss in revenue. Examples are the recent rail accidents in California and Washington D.C. Many immediately questioned selection and training procedures and if the rail industry is selecting the best people to do the job.

Durr & Sherry (2010) surveyed over 350 managers of a state DOT to develop a competency model for use in transportation. Based on their research they identified a series of key competencies that a manager of intermodal transportation should possess in order to be competitive. The main competencies identified were: 1. Emotional Competence ; 2. Safety Culture; 3. Motivation; 4. Innovation; 5. Communication ; 6. Credibility/Integrity; 7. Conflict Resolution; 8. Decision-Making. These key competencies were significantly linked to ratings of job performance by managers overall. Thus, they were demonstrated to have a definite relationship to overall success.

Reports from managers in the field indicate that significant amounts of money are invested each year in providing training and coaching to managers throughout the intermodal industry with the intent of improving performance and increasing competitiveness. In fact, one of the major railroads just invested several millions of dollars in the attempt to improve the competencies of its middle managers. However, little evidence exists to support such expenditures. Questions remain as to what type of managerial training and development is effective. More importantly, the question remains as to how we can measure the change in behavior that persons being trained are expected to demonstrate. The present study was designed to identify tools and methods for evaluating the effects of training on the economic outcomes of a transportation organization.

1.1   Best Practices in Training and Development

According to the American Society for Training and Development by the mid 1940's most companies and organizations had determined that training and development was a fundamental organizational tool. Training seminars that originally were developed in response to national crises became routine organizational programs with a strategy working toward improving corporate   performance and the bottom line. A number of different techniques were used including, in the mid1950s, gaming simulations and then in the 1960s the use of assessment centers increased dramatically. In addition, training laboratories, sensitivity training, programmed instruction, performance appraisal and evaluation, needs assessments, management training, and organizational development were also developed. (ASTD, 2006).

By the 1970s the ASTD had produced the Professional Development Manual for Trainers. Also, the advent of technology began to be felt with the introduction o f training programs that used videotapes, and computers. e IN the 1980s and early 1990s the effects of globalization began to be felt int that business looked to training to maintain competitiveness worldwide. In addition, the impact of new government regulations was felt in the need for diversity training, harassment awareness as well as technical training on such topics as hazardous materials, asbestos and the like, As computers became faster and a more integral part of everyday business activity technical training on the use of software, computers and other office based technology began to be commonplace. knowledge of computers was being taught in the high schools and was considered an essential business skill for many workers. In addition, companies used computers in training and promoted "computer-based training", using automated computer programs to disseminate content and teach skills.

A few training methods have proven highly effective in improving existing and teaching new skills. The most popular are on-the-job training, role playing, self-instruction, team building and simulations, computer-based training, mentoring, and job rotation.

1.2   ON-THE-JOB TRAINING.

On-the-job training (OJT) is the process of teaching new skills while working. According to ASTD, employees acquire approximately 80 percent of their work-related knowledge and skills on the job. The structured forms of OJT relying on a planned process to impart the necessary skills. employers design the training programs so that new employees gain knowledge and experience that will facilitate the performance of these tasks at the appropriate time. trainers assist with the training program as needed.

In the transportation industry on the job training is standard practice for many operating employees. For CSX railroad workers there is four weeks of classroom training at the Railroad Education & Development Institute (REDI) in Atlanta, GA. Then and addition additional 8-22 weeks of on-the-job training at your assigned location.

1.3   ROLE PLAYING.

In role playing (RP) students assume various roles and to practice ways of handling different situations. A trainer will prepare a vignette or scenario that is to be acted out by the participants and guided by the trainer. While the situation might be contrived, the interpersonal relations are genuine. Participants

receive immediate feedback from the trainer and the other participants to enhance their learning and understanding.

1.4   SELF-INSTRUCTION.

In self-instruction employees in training utilize   individual learning approaches and take ownership of their own learning. Self-instruction allows trainees to work at their own speed and receive immediate feedback. This method also benefits companies that have to train only a few people at a time or have a need to be flexible and offer the course at various times throughout the year. .

1.5   TEAM BUILDING.

Team building is the active creation and maintenance of effective work groups with similar goals and objectives. Team building is a formal process following a pre-defined methodology that is designed to building work teams with clear goals and objectives. Team building focuses on the interpersonal skills and processes that facilitate effective work group functioning. Training in communication skills, goals setting, clarifications, summarization, consensus seeking and other skills are essential to the development of high performing teams.

1.6   SIMULATIONS.

Games and simulations are structured competitions and operational models used as training situations to emulate real-life scenarios. An example of the use of simulations is provided by Union Pacific Railroad based in Omaha, Nebraska. UPRR has built a fleet of mobile classrooms to bring state-of-the-art operations and safety training to locomotive engineer and conductor locations across its 23-state system. Housed in four 50-foot-long and one 48-foot-long mobile classrooms and equipped with communication capabilities to sync with UPRRS's mainframe computer network, the remote sites area able to access the most current instructional sessions and federal training documentation. Locomotive Engineer Assist Display/Event Recorder (LEADER) or Trip Optimizer – LEADER assists locomotive engineers in reducing fuel consumption while

effectively managing trip time and minimizing in-train forces, while Trip Optimizer reduces consumption by automatically controlling the throttle to minimize fuel usage; (UPRR, 2015).

Throughout the years, Union Pacific has used existing or rented training facilities across most its network to prepare employees for their railroad career, introduce them to new technology and provide them with refresher courses. The new mobile classrooms will supplement ongoing training conducted at leading-edge facilities across the Union Pacific network, where employees are introduced to new technology and provided refresher certification courses.

Other railroads also use simulators. For example, BNSF Railway Co.'s Technical Training Center in Overland Park, Kan., has been using simulartors for some time. Recently the company reported that they had trained and evaluated over 5,000 engineers this year, using one of the railroad's 48 network simulators. Last year, the center set a record by training 4,000 engineers.

Locomotive simulators are placed at terminals across BNSF's system in addition to the training

center. Each simulator is controlled from the center by an instructor who evaluates the engineer's performance by providing scores and feedback on a completed run.

The simulators have helped BNSF improve safety because engineers can practice handling trains in a variety of situations. On average, more than half of all engineers complete simulator training each year since they are required by law to recertify at least every two years. (Progressive Railroading, 2009).

1.7 COMPUTER-BASED TRAINING.

In computer-based training (CBT), are used to structure and present instructional materials and to facilitate the learning process for the student. Effectiveness is improved through standardization and individualization. In recent years, videodisc and CD-ROM have been successfully integrated into PC platforms allowing low-cost personal computers to serve as multimedia machines, increasing the flexibility and possibilities of CBT.

1.8 MENTORING.

Mentoring is increasingly popular with man companies. For example, Research (Sherry, 2011) suggests that female employees with mentors are likely to be more successful in transportation companies. Mentoring includes the use of senior or more experienced employees serving in the rol of advisers, counselors, and role models—for trainees or new hires. Mentors can offer advice on how to perform specific tasks, but also on how to succeed in the company, how the company's corporate culture and politics work.

1.9 JOB ROTATION.

An essential training program for persons aspiring to develop more general management skills includes job rotation. ,Companies can create a flexible workforce capable of performing a variety of tasks and working for multiple departments or teams if needed. Even in the manufacturing sector the practice of cross training employees on several different tasks within in department or foundation contributes significantly to the ability of the employees to be effective and work

together. Companies use training and development programs to develop both specific and general skills and will offer training in technical areas, sales training, clerical training, computer training, communications training, organizational development, career development, supervisory development, and management development. Communications training concentrates on the improvement of interpersonal communication skills, including writing, oral presentation, listening, and reading.

1.10 MANAGEMENT AND SUPERVISORY DEVELOPMENT.

Management and supervisory development provides managers and supervisors with the skills needed to effectively lead and work with a variety of individuals in a number of different jobs, positions and functions. Managers typically focus on the effective management of their employee resources, and use planning, decision making, and careful utilization of resources to apply and direct their personnel to the accomplishment of a a specific goal. As person become more senior they lear additional skills to boaden their scope and ability. Management training typically involves individuals above the first two levels of supervision and below senior executive management. Management development may also include programs that teach decision-making skills, creating and managing successful work teams, allocating resources effectively, budgeting, communication skills, business planning, and goal setting.

1.11 Determining the Value of Training

Based on a survey by Price Waterhouse Consulting 61% of CEOs have yet to take any action to revise their recruitment strategies, despite 93% of those same CEOs acknowledging the need to do so. (PWC, 2014) Furthermore, according to PWC in 2013, 77% of CEOs reported planning to change their strategy for managing talent but, over the past seven years of CEO surveys by PWC, talent management was identified as the main target for strategic change in every year, and their concerns about availability of talent have also increased. However, it is unclear what CEOs are doing to address these concerns. Interestingly, one report indicated that when talent decisions are poorly made, mostly with respect to hiring, can cost two to three times the salary level of the position.

1.12 EVALUATING TRAINING PROGRAMS

Because of the great investment in training over the last 50+ years it has become important to evaluate a training the program's success. Often the first question is whether the trainees have learned what they need to from the training. Other times, companies simply want to make sure that employees have attended the training to ensure that they have met the minimum requirements for certain government regulations. Then they are also interested in determining if the trainees have acquired the desired skills and knowledge. Evaluation of training programs can also lead to determine whether the are things that need to be done to improve training

In order to evaluate training programs, companies must collect that should be easily measurable and quantifiable such as costs, output, quality, and time, according to Jack J. Phillips in *Recruiting, Training, and Retraining New Employees.*

1. Costs: budget changes, unit costs, project cost variations, and sales expenses.
2. Output: Units produced, units assembled, productivity per hour, and applications reviewed.
3. Quality: Error rates, waste, defective products, customer complaints, and shortages.
4. Time: On-time shipments, production or processing time, overtime, training time, efficiency, and meeting deadlines.

Companies can use qualitative data such as work habits, attitudes, development, adaptability, and initiative to evaluate training programs. Additionally, companies can look at efficiency, reactions to learning, behavior change, performance change, and overall satisfaction. Most companies, however, prefer to place more weight on the quantitative data previously outlined.

Furthermore, according to Phillips, companies tend to evaluate training and development programs on four levels: behavior, learning, reaction, and results. Businesses examine employee behavior after training programs in order to determine if the programs helped employees adjust to their environment; also, companies can obtain evidence on employee behavior via observation and interviews. Throughout the training process, employers monitor how well trainees are learning about the company, the atmosphere, and their jobs.

To evaluate training and development programs effectively, employers also gauge employee reactions to the programs. This feedback from trainees provides companies with crucial information on how employees perceive their programs. Using questionnaires and

interviews, companies can identify employee attitudes toward various aspects of the training programs. Finally, employers attempt to determine the results of their training programs by studying the quantifiable data addressed earlier as well as by considering the **employee turnover** rate and job performance of workers who recently completed a training and development program.

Return on investment (ROI) is a standard way of looking at the impact of training programs. The calculation of ROI is a relatively simple process, however, obtaining the inputs into the equations is fairly complex. The calculations for ROI are as follows:

$$\% \ R \ O \ I = (benefits/costs) \ x \ 100$$

Determining the costs of training is likely to include design and development of the training program itself in terms of amount of time, and therefore cost of deseing, and materials. In addition, the cost of materials, faculty, supplies and facilities should also be included. Any costs for time involving students or participants also needs to be included. The cost could simply be the payroll or hours costs. Another way to calculate ROI is to look at how long it will take before the benefits of the training are recouped.

It may not be readily apparent what the costs are and what the savings might be. Another way of looking at the impact of training is to check on the impact of the training using some kind of measurement device. In some cases, where mastery and achievement are considered a desirable outcome, the use of a before and after assessment is employed. In this case the overall change scores can be used as an estimate of growth or impact.

An important development in the assessment of the overall utility of measuring devices was offered by Schmidt & Hunter (1998). In their analysis they determined that one way of assessing the out put of an employee is to look at their productivity. One method of assessing productivity of employees relative to each other is to use salary as a relative measure of value to the organization. While there are many factors that affect salary decisions, taken on the whole a person's salary is a rough indicator of their value to the company.

Stipulating that assumption , Schmidt and Hunter (1998) argued that a ones salary can an indicator of relative performance. For example if a person is a top performer in an organization, then it is reasonable to assume that they have a greater level of output than a non-superior

worker. Further, if a superior worker is defined as one whose performance is at the 84th percentile level, (that is 1 standard deviation above the mean) then an average output worker in a similar job would have a lower level of performance and most likely be at the 50th percentile. Hunter identified that persons in various jobs have different standard deviations of output.   The average standard deviation for unskilled and semi-skilled jobs is 19%, for skilled work it is 32% and for managerial and professional jobs it is 48%. Thus, if a superior worked is defined as one who is one standard deviation above then their output in a lower level job produces 19% more output than an average worker, or a superior skilled worker produces 32% more output, and a superior manger on the other had produces 48% more output than the average manager.

When looking at how training is contributing to the bottom line, then we may be able to estimate productivity and output by showing a relationship between improved test scores and estimated increases in productivity. Put another way, the impact of training on economic outcomes and competitiveness may be estimated from performance on tests which measure underlying constructs and therefore allow us to algebraically compute the impact on monetary value. Performance on standardized measures of performance which are used to tap performance on key constructs being addressed in training and development seminars and the like should be directly related to job performance and the value proposition from that performance can be directly derived as a function of the change in performance. The purpose of this study will be to demonstrate the use of standardized measures for estimating the change in economic value and the return on investment as a result of training.

2   *Method*

2.1   Participants

A measure of managerial competence was developed and administered to a sample of mid-level managers in the intermodal transportation industry. The participants were mostly male with approximately 5 to 15 years of experience.

2.2   Training and Development Program

A training and development program was designed for mid-level operating managers responsible for manager transportation terminals. The terminals were located in several different metropolitan areas of the Western United States.   The managers supervised a number of employees ranging from 25 to 333.   Managers were responsible for budgets, personnel, regulatory compliance, customer relationships, and management of different functions and duties at their locations. Managers were expected to attend a two-day workshop that would focus on the key leadership competencies recently identified by the organization as critical to success. A trainer and a facilitator conducted the workshop and engaged the participants in key discussions and exercises.

2.3   Measures

In order to measure the outcome of the leadership development workshop a measure of leadership competency was developed. The purpose of the measuring device was to accurately assess the level at which the participants were responding relative to he key leadership competencies identified.

The leadership measurement tool was developed with a focus on providing an accurate assessment of behavior relative to the competences. Accordingly situational examples of actual real on the job situations were identified for each of the key competencies that were identified for the project. In addition, examples of excellent performance and substandard performance were also generated. In other words, based on the idea leadership competency model it was thought that there were in fact correct responses and ways in which a leader knowledgeable and well trained in these skills would behave.

In order to fully develop the scenarios that would be used as stimulus items and the appropriate responses to each in depth interviews and focus groups were conducted with several scenario managers who were deemed knowledgeable and expert in responding to typical managerial situations. The research team met with these individuals and made detailed notes of examples of how to respond to the vignettes. The responses to the vignettes were arranged in a hierarchical order going from "Company Leader," meaning high performance or high performer, to "Unacceptable" performance. A total of 28 scenarios were created with five responses to each

scenario. The vignettes were grouped into six main categories reflective of the key leadership competencies deemed to be desirable and contributing to the success of the organization. These were: Change Management, Decision Making, Handling Adversity, Managing Conflict, Relationship Skills, and Team Leadership.

In order to establish the validity of these vignettes and responses the material was presented to another set of expert managers who reviewed the scenarios and responses and determined that they were in fact relevant, real world and that the sequence of responses was acceptable and reflective of high to low levels of performance.

2.4   Procedure

Once the scenarios and their responses were developed and established they were administered to the participants of the training seminar. Respondents completed the instruments online and the data were collected centrally. Responses to the scenarios were completed on a five point scale in which the 5 was equal to the highest possible correct score for a "Leader" ; a 4 was assigned to a "Cross-Functional" leader and a 3 was assigned to an "Effective Leader" and a 2 was assigned to a "Developing" response, 1 was assigned to an "Unacceptable" score.

3   Results

3.1   Descriptive Analyses

A total of 71 useable responses were obtained from the study participants.   The respondents were predominantly male   The sponsoring company would not permit the assessment of age, gender, or race of the respondents due to concerns about confidentiality, possible EEOC issues and other sensitivities in the workplace.

The mean responses to each of the categories was tabulated and presented in Table 1.

Table 1. Means and Standard Deviations of Training Sample

	Mean	SD
Team Leadership	3.88	0.5
Relationships & Influence	4.04	0.4
Managing Conflict	4.26	0.6
Handling Adversity	4.21	0.6
Decision Making	3.58	0.6
Adaptability & Change Management	4.29	0.4
Composite Score	4.04	0.23

Plotting the results of the assessment of the participants we can see that there is a range of scores ranging from needing remediation to being adequate on the dimension of decision making. Similar results were obtained on the other dimensions which are plotted in the Appendix.
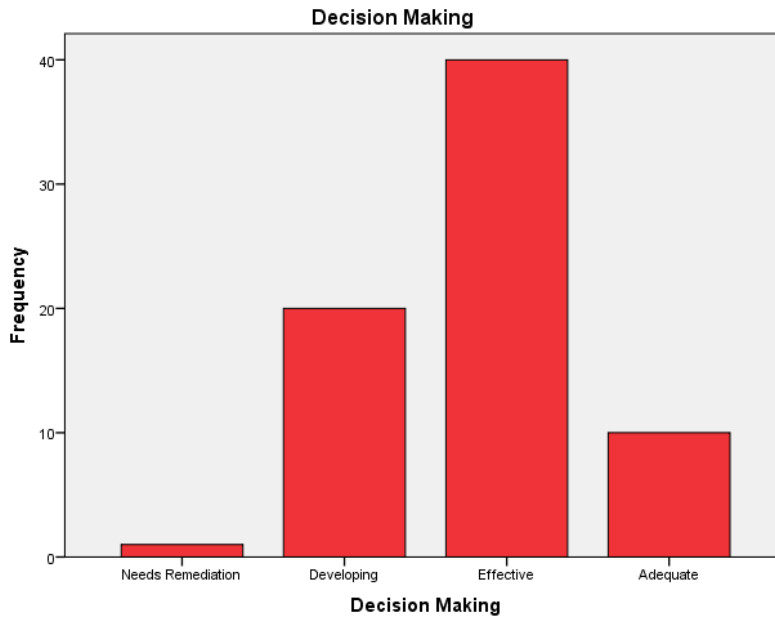
Figure 1. Decision making competency frequency deistirubtion.

The main point from this graph is that the overall performance on this dimension is weak. As an operating leader this would seem to be an area that is in need of considerable improvement. Consequently, the purpose of the training would be to increase the performance and raise the bar.

Table 2. Decision Making

	Frequency	Percent	Cumulative
Needs Remediation	1	1.4	1.4
Developing	20	28.2	29.6
Effective	40	56.3	85.9
Adequate	10	14.1	100.0
Total	71	100.0	

As can be seen from the previous slides there is a range and that just under 30% of the sample respondents performed at a developing level or less. Taken together this suggests that the

average performance of the work group is the below average level as determined by the subject matter experts responsible for developing and establishing the anchors for this scale. In other words, assuming that the behavioral examples established for the measurements are followed it is apparent that the performance of the sample is in need of improvement. The practical question then is what would the training or improvement add to the overall performance of the work being performed. Threrfore, in order to estimate the overall economic benefit for the training and development program it would be useful to know the economic impact of moving the performance of the below average group up to an average level

Based on information provided it was determined that the average salary of the group is approximately $95,000 to $149,000 per year according to GlassDoor (2016). Consequently, we estimated that the then the average performance is worth about $100,000. Based on these data then we can estimate, with the mean now being equivalent to 100,000 and we can estimate that the standard deviation of the sample would remain approximately the same. However, for discussion purposes, and to take into account the range specified in the salary survey we will set the standard deviation on a monetary level to be equal to $15000. Using the excel @standardize function we can create a standardized equivalent of the salaries of the participants in the study.

Based on the results of the analysis we can see that there are 21 people who are at the "Remedial" or "Developing Leader" level. If the training is successful then we would expect that the developing leaders would raise their score by at least one point and the "remedial" leaders by two points. This would move them to the "Effective" leader level. Based on our analysis earlier, and consistent with Schmidt and Hunter, an increase of one standard deviation can be translated into a monetary equivalent. Thus, taking 20 people and moving them up one level would bring their job performance up to that of effective leader.

Based on our assumptions then, since we have set the salary equivalent of the standard deviation at $15000 we can assume that the performance equivalent of a raise in their job performance by one standard deviation would be the equivalent of a $15,000 dollar increase in value. Thus, 20 x $15,000 would be worth approximately $300,000 dollars in value. Assuming that the training would have an equal effect on all of the participants in the program we would expect all 71

participants to increase their performance for a value of $15,000 x 71 = 1,065,000. However, it is unlikely that the top performers would increase their scores since they are already at the ceiling. Thus, a realistic expectation would be that only (71-11= 60) and since we cannot expect a perfect result from the program lets say that about half of the people actually do improve. That would be a total of (30 x $15000 = $450,000) improvement in outcome. The various benefit scenarios are presented in Figure 2.

Figure 2. Salary benefits of training program.

One caveat is needed. These estimates assume that the training program resulted in an *overall improvement in job performance.* In other words, if the competency improved is not directly related to overll job performance then these number would have to be adjusted by a factor appropriate to the contribution that the competency training was able to address. For example, if the training were on some legal or compliance matter which probably is only minimally related to overall performance then the analyses presented here would be less applicable. In this case however, developing a competency such as decision making or conflict resolution, which we would expect to be a major part of the job performance of a Director level manager or above, then we could expect decision making to be directly related to performance and thus the analyses presented here would be quite appropriate.

3.2   Costs of Program

What were the costs of the program? According to information shared by the company, the program staff consisted of one consultant, a portion of two full-time staff, a manager, plus the cost associated with the time spent by the participants in the program. A total cost for 71 participants in a two programs plus travel was estimated at $384,423.

Table 3. Itemized costs of training prgram.

Item	Cost
consultant	$25,000
staff	100,000
participants	81923.08
travel	177500
	$384,423

3.3   Cost Benefit Analysis

What are the benefits to costs of training? Having calculated the anticipated costs and benefits of the program we can attempt to estimate the cost- benefit ratio of undertaking a program. Clearly the key issue is whether there will be benefit and whether the benefits will exceeds the costs. To the extent that the benefits do in fact relate to the overall performance then a key criteria of the program is met. The overall benefit of the training increases linearly in conjunction with the number of employees participating in the training.
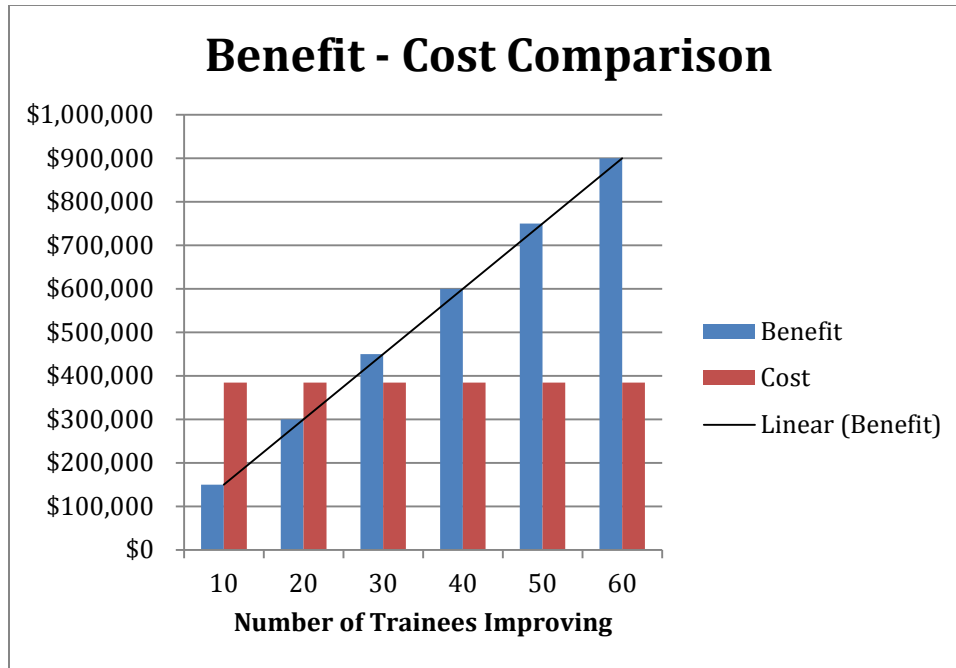
Figure 3. Benefit Cost COmparion

Examining the total costs of the program ($384,000) and the total benefits expected conservatively ($450,000) we determined that a residual of approximately $65,577 was realized after all the costs and the improvements in job performance were estimated. This cost benefit comparison resulted in approximately an overall 17% improvement in job performance.

3.4   Summary

These analyses have demonstrated that the beenfits of a managerial leadership training program can be quantified and that the average cost of improvement can be estimated ased on the number of participants in the program. For the present program the expected improvement in overall performance was estimated to be a 17% improvement in job performance as measured by annual salary.

4   Summary and Conclusions

As noted earlier major railroads and other intermodal transportation companies invest millions of dollars in an attempt to improve the competencies and overall job performance of managers and company leaders in an effort to enhance economic competitiveness and to provide a greater return on investment (ROI) to shareholders and stakeholders. The present research investigated a managerial development training program and developed a performance metric to assess managerial effectiveness that could be used to determine the cost benefits and return on investment of the program. Following a review of the literature it was determined that there are are a number of different approaches that are in use today to enhance managerial effectives. However, few if any metrics or assessment tools exist to measure and ultimately quantify the impact of these interventions on overall job performance and ultimately ROI. A measurement tool for assessment managerial effectiveness and competency was devised for and implemented with a sample of directors for a large transportation company. Based on analysis of the data it was determined that a corresponding indicator of job performance, annual salary was appropriate as a metric to establish job performance and ROI outcome data. Using standard utility analysis technology developed for the human resources industry an approximation to the measurement of job performance was calibrated and a standardized metric derived. Subsequent analyses revealed performance improvement of nearly half a million dollars in annual salary. Thus the return on investment was estimated at 17% improved performance.

The study design and analytical techniques utilized demonstrate an effective method for estimating the return on investment for managerial effectiveness training using approapriate metrics, measurement tools and analytical algorithms.

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13. Phillips. J. Recruiting, Training, and Retraining New Employees.
14. Schmidt & Hunter, 1998
15. Tett et al., 2000
16. Vogel, 2001

6   Appendix 1- Individual Feedback Report

Transportation Company, Inc.

Operating Leadership Self-Assessment
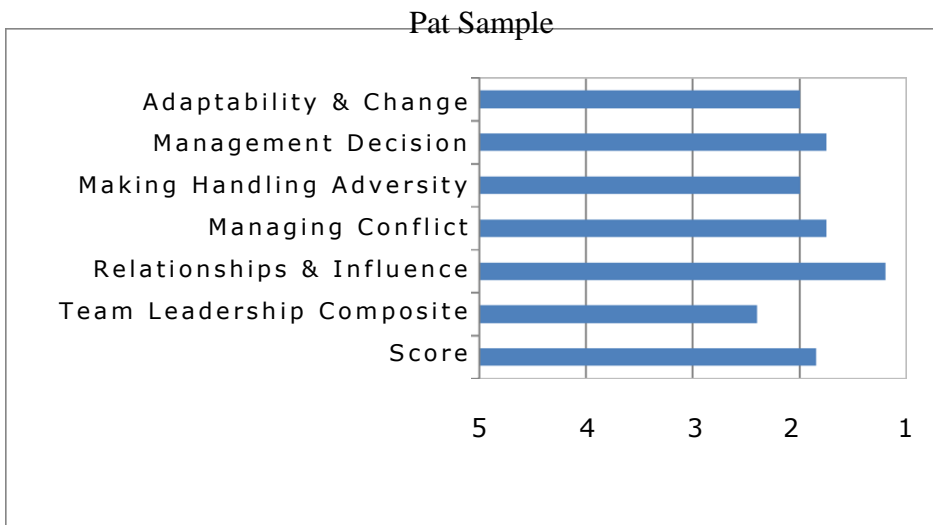
Report

For

Mr. Pat Sample

October 23 2015

31

This report was generated as a result of participation in the Operating Leadership Self-Assessment (OLSA). The results contained within this report are confidential and are intended for training and developmental purposes only. The Union Pacific Operating Department created this self-assessment tool to help guide you with your personal development. The purpose of the tool is to help you develop your leadership skills. Operating will not use the assessment for employment decisions. There are no penalties associated with using this tool.

Purpose

The OLSA tool is designed to measure your leadership competencies and provide information about how you view your leadership and managerial skills and behaviors. A leadership competency is a measurable, behavioral characteristic of a person that is related to effective performance in a specific job, organization, or culture. Competencies are distinct sets of behaviors applied to reliably complete a task that is directly linked to a critical outcome. These characteristics are defined in terms of specific leadership behaviors, and therefore can be developed. The feedback provided in this report can help you identify the core competencies that you have mastered and also offer insight on those you may wish to further develop.

Pat Sample

Subcompetency Scores	Andrew Steinkamp
Adaptability/Change Management	**2.0**
Handling Ambiguity	**3.0**
Agility	**1.5**
Leading Change	**2.0**
Decision Making	**1.8**
Self Aware	**1.0**
Sense of Urgency	**4.0**
Data Driven	**1.0**
Judgement	**1.0**
Handling Adversity	**2.0**
Tenacity	**3.0**
Courage	**1.0**
Composure	**2.0**
Managing Conflict	**1.8**
Listening	**2.0**
Objective Assessment	**1.0**
Responsiveness	**3.0**
Prevention	**1.0**
Relationships & Influence	**1.2**
Trust	**1.0**
Compassion	**1.0**
Teamwork	**1.0**
Organizational Savvy	**2.0**
Team Leadership	**2.4**
Team Commitment	**4.0**
Team Achievement	**4.0**
Employee Engagement	**1.0**
Team Talent Management	**2.0**

7   Appendix 2 - Group Report

Transportation Company, Inc.

Operating Leadership Self-Assessment

Report

For

Class Participants

October 23 2015

This report was generated as a result of participation in the Operating Leadership Self-Assessment (OLSA). The results contained within this report are confidential and are intended for training and developmental purposes only. The Transportation Company Operating Department created this self-assessment tool to help guide you with your personal development. The purpose of the tool is to help you develop your leadership skills. Operating will not use the assessment for employment decisions. There are no penalties associated with using this tool.

Purpose

The OLSA tool is designed to measure your leadership competencies and provide information about how you view your leadership and managerial skills and behaviors. A leadership competency is a measurable, behavioral characteristic of a person that is related to effective performance in a specific job, organization, or culture. Competencies are distinct sets of behaviors applied to reliably complete a task that is directly linked to a critical outcome. These characteristics are defined in terms of specific leadership behaviors, and therefore can be developed. The feedback provided in this report can help you identify the core competencies that you have mastered and also offer insight on those you may wish to further develop.

10/23/14 --- Class Average (N=15)

Oct 23 Class - Mean

Operating Leadership Self-Assessment Group
Report

10/23/15 -Class Average (N=15)

Adaptability & Change
Management Decision
Making Handling Adversity
Managing Conflict
Relationships & Influence
Team Leadership
Composite Score

5   4   3   2   1

Oct 23 Class - Mean   Grand Mean (N=7)
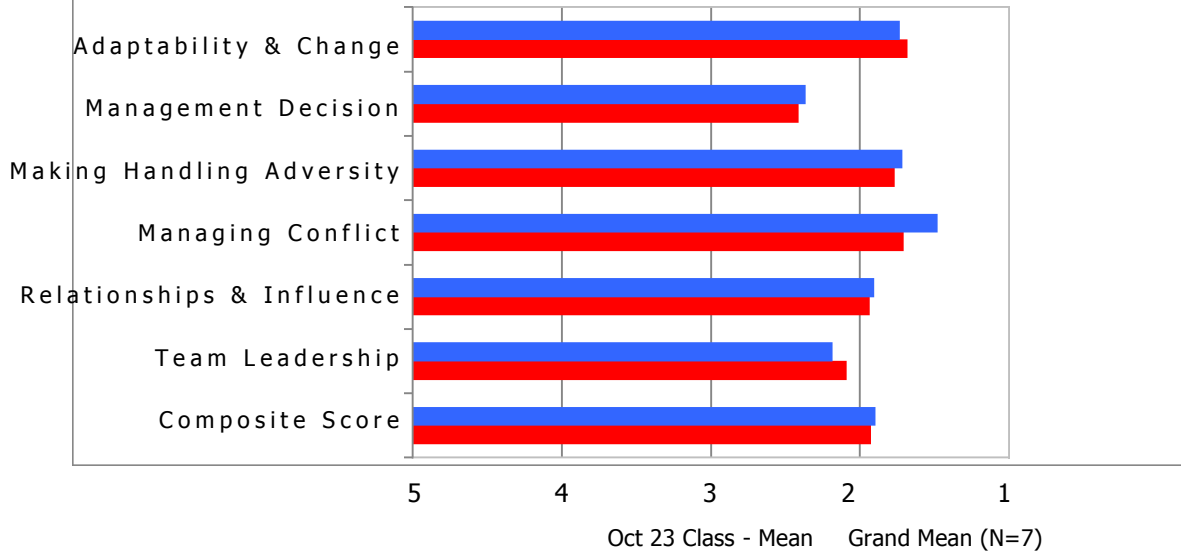
8   Appendix 3 - Plots of Effectiveness Scores
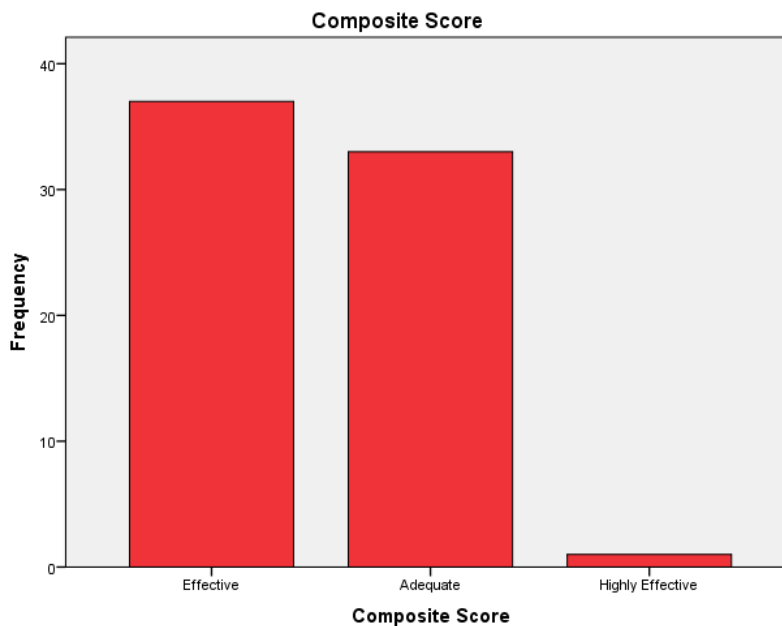
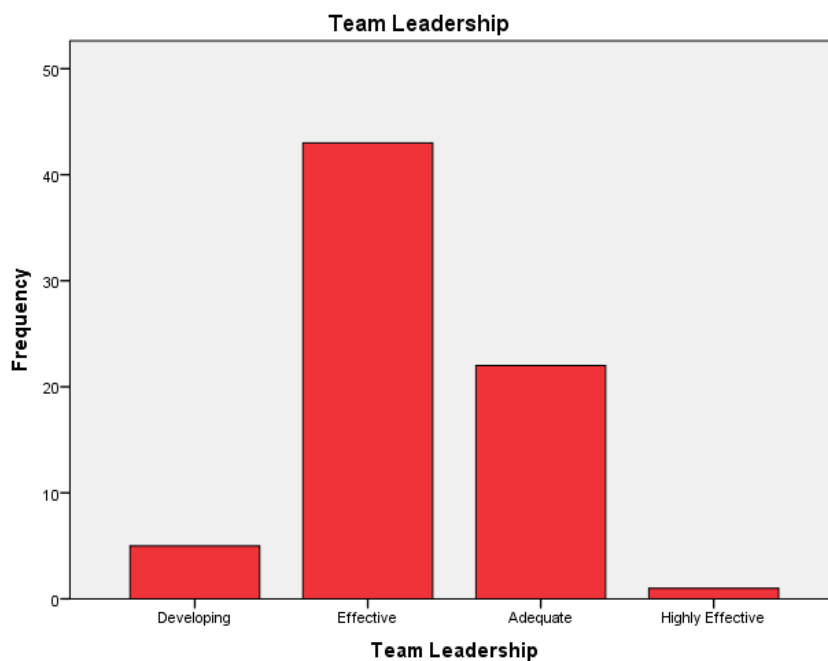**Figure 4. Composite Scores of managerial effectivness measure.**
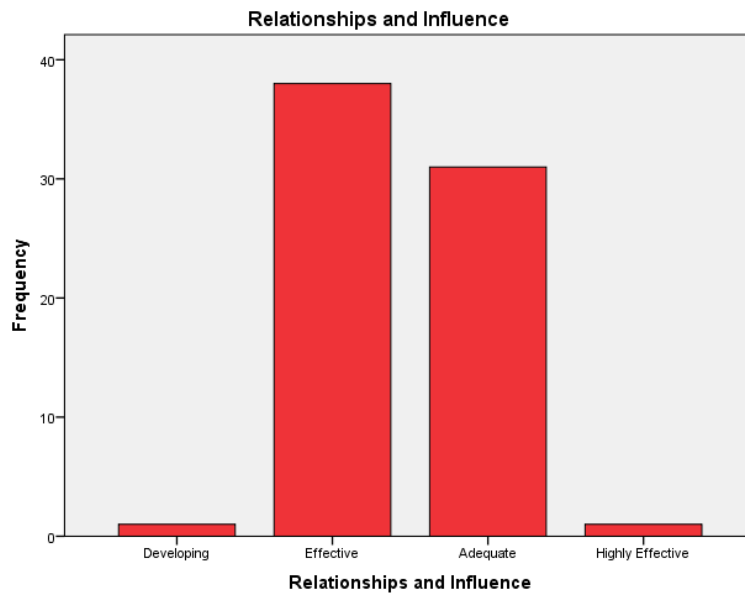

Figure 5. Team Leadership scores of managerial effectivness measure.

Figure 6. Relationship and influence scores of managerial effectivness measure.
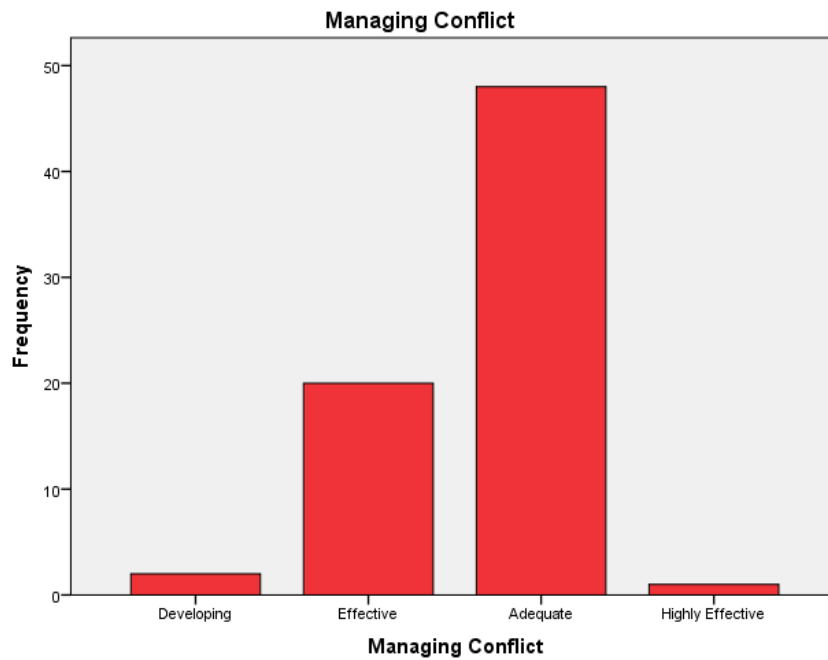
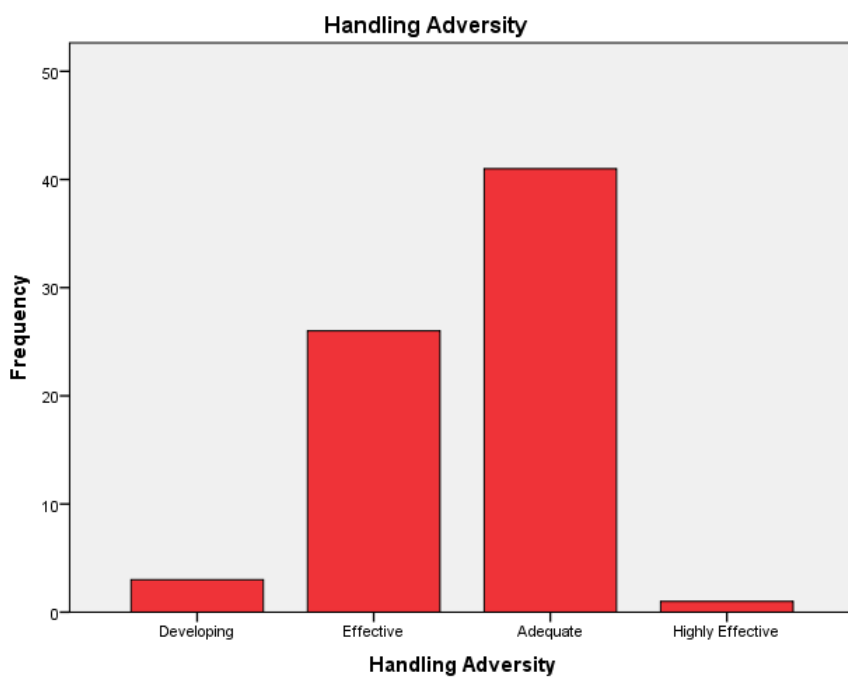**Figure 7. Managing conflict scores of managerial effectivness measure.**

Figure 8. Handling adversity scores of managerial effectivness measure.
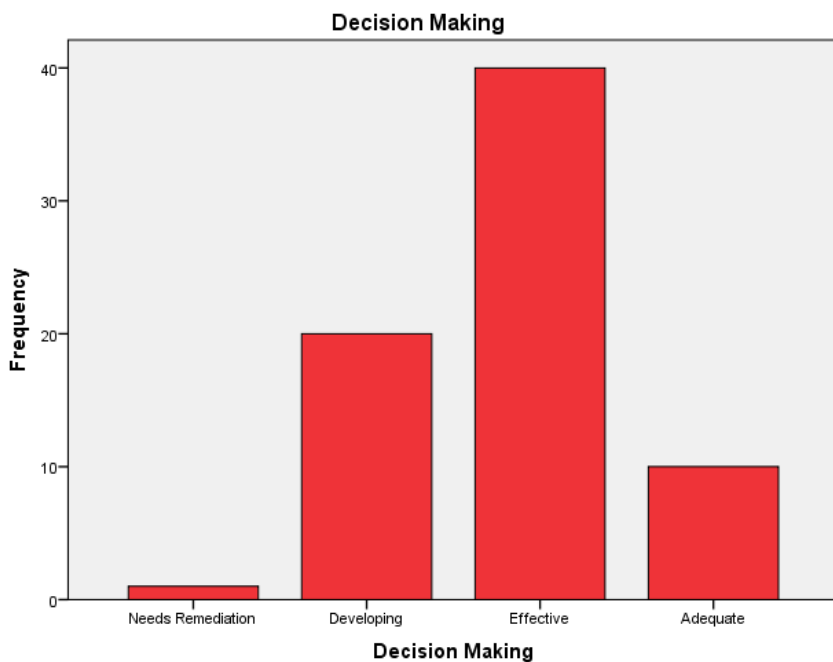

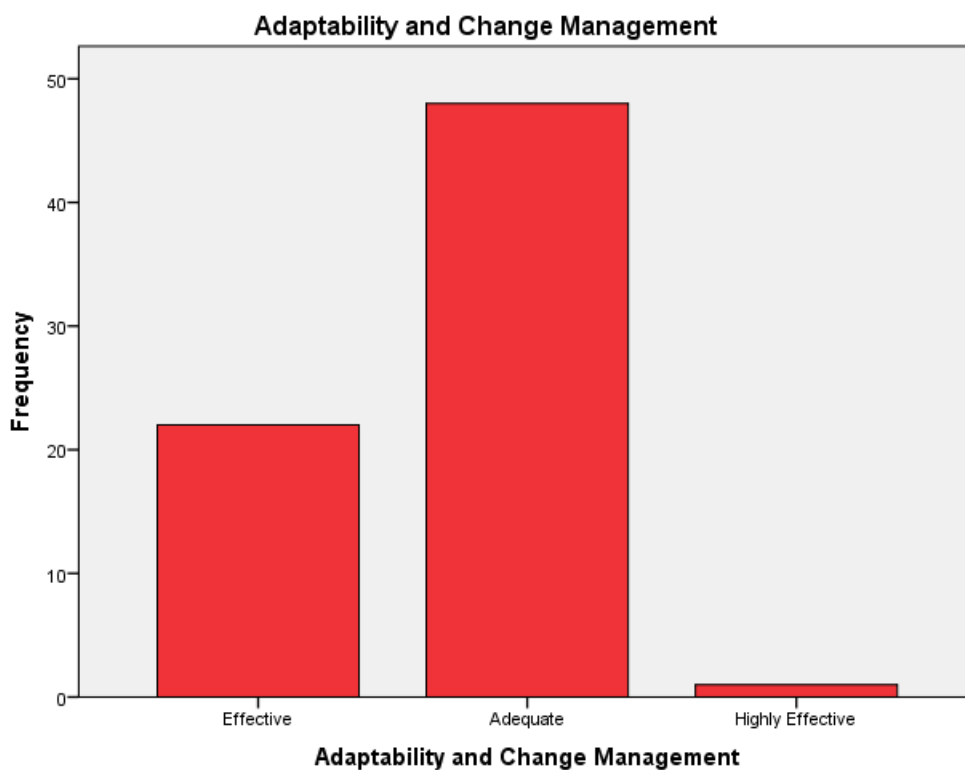**Figure 9. Decision making scores of managerial effectivness measure.**

Figure 10. Adaptability and change scores of managerial effectivness measure.