Motivational Climate of Construction Apprentice

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Abstract: A survey of construction apprentices was conducted in a midwestern city using the expectancy model as a framework. The findings indicated a need for an improved motivational climate for apprentices. Their overall motivational score was low. The study suggests that contractors are not providing a variety of rewards to apprentices. It also indicates that little is done to help the apprentice in learning and staying in the trade. As a result, it provides researchers with a starting point in studying how to maintain a balanced motivational climate for an apprentice.

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Introduction

One of the issues confronting constructors and owners of construction projects is how to improve construction productivity. Stated in another way, how can construction projects be completed cost effectively? Although, there are several components that make up total construction cost, labor accounts for 10–50% of total project cost (Russell 1999). Because of the magnitude of labor, there have been several studies that have focused on how to motivate construction workers so as to improve construction productivity. It is believed that increasing construction worker productivity through improved motivation would result in significant savings in construction costs.

Motivation has been defined by several people in different ways. Atkinson (1964) defines it as the contemporary immediate influence on the direction, vigor, and persistence of action. Vroom (1964), however, defines it as a process governing choice made by persons among alternative forms of voluntary activity. Campbell and Pritchard (1976) defines motivation as a set of independent and dependent relationships that explain the direction, amplitude, and persistence of an individual's behavior holding constant the effects of aptitude, skills, understanding of a task and the constraints operating in the work environment. What all these definitions have in common is that they are primarily concerned with what energizes human behavior, what directs or channels such behavior and how the behavior is maintained or sustained.

Each of these issues is important in the study of worker motivation. First, they show the forces within individuals that drive them to engage in certain behavior and the conditions within the environment that trigger those drives. Second, they view motivation as a system. That is, they consider those forces in the individual and in the environment that either reinforce or dissuade the individual to engage in that behavior. Third is that they assume that individuals are goal oriented. That is, they have something they hope to attain.

Motivation of construction labor was studied in the early 1970s by Schrader (1972) and then in the later part of 1970 by Borcherding (1981). However, it was Maloney and McFillen (1984) that studied construction worker motivation extensively using the expectancy theory as the framework in the mid-1980s.

Much of the research work on motivation in construction prior to the study by Maloney and McFillen (1984) focused on satisfaction, dissatisfaction with job and the corresponding motivational level of craftsmen or foremen. Therefore, there was a need to study the motivation of construction workers, the climate, how to improve productivity, and provide workers with satisfying and rewarding work experiences.

There has been no study on the motivation of the construction apprentice. Because apprentices are the future of the construction workforce, there is a need to evaluate the perceptions of apprentices about the dimensions of their work and how they can be motivated. This paper focuses on the motivational climate of the construction apprentice.

Motivational Theories

There are many theories describing different aspects of motivation. Maslow's hierarchy of needs (1954) was the first major theory of motivation applied to an individual at work. According to this theory, people are motivated to satisfy important personal needs. These needs are hierarchical in nature, ranging from simplest to complex such as physiological (food, shelter, water, and air), safety, social, ego, and self-actualization. According to Maslow, lower-level needs must be satisfied before higher-level needs can influence behavior. Also, satisfied needs do not motivate whereas unsatisfied needs can influence behavior.

Herzberg's motivator-hygiene theory (1966) describes motivational behavior by "motivators" and "hygiene" factors. Motivators such as achievement, recognition, responsibility, advancement, and growth result in satisfaction, whereas hygiene factors such as company policies, salary, co-worker relationship, working conditions, money and benefits result in dissatisfaction.

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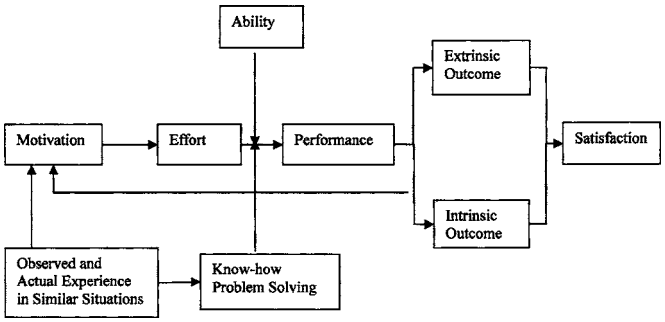

Fig. 1. Simplified expectancy—theory model of behavior

Further, the theory states that eliminating the causes of dissatisfaction would not cause satisfaction.

Schrader (1972) analyzed the motivation of construction craftsmen using Maslow's hierarchy of needs. He summarized that the physiological needs of most craftsmen are satisfied through sufficient earnings and that workers are motivated by higher needs such as belonging, status, or security. Implementing Herzberg's motivator-hygiene theory in an empirical study, Borcherding (1981) concluded that factors such as the nature of work, co-worker relationships, good orientation, good safety programs, pay, overtime, and recognition act as motivators whereas factors like rework, work delays, crew interference, and a foreman's incompetence cause dissatisfaction among construction workers.

Cognitive theories of motivation explain motivational behavior as a function of expectancies and valances. Expectancy is defined as an individual's belief that a particular action will lead to a certain outcome. Valence is the positive or negative value attached to the expected outcome by the individual. Vroom (1964) developed an expectancy model specifically for work situations. According to Vroom, employees will apply effort to those tasks they find attractive and that they believe they can perform. Vroom defined effort to performance ($E \rightarrow P$) expectancy as an individual's subjective probability that effort will lead to the successful performance of some job or task. He also defined performance to outcome ($P \rightarrow O$) expectancy as an individual's belief that a particular level of performance will result in a set of outcomes.

Valence was defined as the extent to which the task outcome appears attractive or unattractive to the individual. According to the theory, $E \rightarrow P$ expectancies, $P \rightarrow O$ expectancies and valences of various outcomes influence an individual's level of motivation. In this multiplicative model these three factors need to be high for the motivational level of an individual to be high. Vroom's expectancy model presents the amount of effort an individual expends on any task, but it does not define the meaning of effort completely. Vroom's theory tends to ignore habitual behavior and subconscious motivation.

Porter and Lawler (1968) redefined Vroom's expectancy model contending that effort as portrayed by Vroom may not necessarily result in performance because an individual may not have the ability to perform the task or clear understanding of how to do the task at hand. Also, the relationship between valences and expectancies and effort or motivation is more complicated than that mentioned in the Vroom's expectancy model. The model states that performance and satisfaction may not necessarily be related to each other and depend on several factors.

A conceptual model of the expectancy theory of worker motivation, performance, and satisfaction as developed by Porter and Lawler (1968) is presented in Fig. 1.

People engage in work primarily to accomplish something for themselves. This they do by getting their task done with the hope of receiving rewards. The rewards they get or the work outcomes serve as the means of satisfying their needs. There are three major variables that are at the core of expectancy theory. The variables are expectancy, instrumentality, and valence. A detailed discussion on expectancy theory can be found in Maloney and McFillen (1984).

Expectancy is the link between an individual's expenditure of effort and his performance of a task. This is a subjective probability that if an individual exerts effort, it will lead to the performance of the specified task ($E \rightarrow P$). As a result, an expectancy of 0 indicates that the individual perceives no chance of being able to perform the task. On the other hand an expectancy of 1 indicates that the worker believes that by exerting effort he will perform the task.

Instrumentality is the relationship of the performance of the task to the potential outcomes that the worker expects to receive as a result of performing the specific task. It is defined as the worker's subjective probability that performance will lead to the desired outcomes ($P \rightarrow O$). Thus, when it is 0, it indicates that the worker believes that there is no chance of receiving that specific reward. An instrumentality of 1 on the other hand indicates that the reward will be received every time the task is performed.

The other variable is valence (V). This is the anticipated satisfaction associated with a specific outcome. Because actual satisfaction can only be determined after an outcome has been received, it is prospective satisfaction. Its value ranges from -1 to 1. A valence of -1 is perceived as eliminating current and preventing future satisfaction. If an outcome has a valence 0, it is neutral. That means it does not have the ability to either enhance or prevent further satisfaction. A valence of $+1$ indicates that the outcome has a great ability to satisfy needs.

Maloney and McFillen (1984) studied the performance of construction workers using expectancy theory and model as developed by Vroom (1964) and Porter and Lawler (1968). Research conducted by them confirmed that the expectancy model of worker performance and satisfaction is valid and is applicable to construction industry. With this background on motivation and relevant work done in construction industry, this paper describes motivation, satisfaction, and performance of the construction apprentice using the expectancy model.

Data Collection

Data was collected using a comprehensive questionnaire developed based on the expectancy model. The study instrument used by Maloney and McFillen (1984) was adopted and modified for this study by including a section on construction worker safety. A unionized Midwestern Building Trades Council and their members were contacted to distribute the survey instrument. Out of 600 questionnaires, 319 (53.17%) were returned. This response rate was deemed adequate for a study of this nature. We received 30 incomplete surveys and they were discarded, thus, leaving 289 valid responses for the analysis. Of this number, 201 (33.5%) respondents indicated that they were apprentices. It is the response of this group that is the basis for this paper.

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Table 1. Primary Trade of the Respondent

Trade	Number	Percent
Asbestos workers	18	9.0
Electric workers	118	58.7
Painters	10	5.0
Roofers	15	7.5
Others[a]	26	12.8
Missing	14	7.0
Total	201	100.0

[a]Includes brick layers, carpenters, cement masons, plasterers, and tile marble and terrazzo helpers.

Table 2. Effort by Primary Trade of the Respondent

Trade	Mean
Asbestos workers	0.90
Electric workers	0.89
Painters	0.97
Roofers	0.91
Others[a]	0.95
Average	0.92

[a]Includes brick layers, carpenters, cement masons, plasterers, and tile marble and terrazzo helpers.

Demographics

From the data, the demographics for a construction apprentice were analyzed by gender, age group, ethnicity, primary trade, schooling, technical education, and number of years in the trade. There were 16 respondents that did not indicate their gender, 13 responses came from female apprentices, and 172 from male apprentices. The ethnic background of the majority of the apprentices was white (76.61%). Considering the primary trade of the respondents, 118 apprentices (58.7%) were electrical workers. Although, the majority of the apprentices belonged to electrical trade, apprentices from other trades were also included in the study. The age of the respondents varied from 18 to 60 with a mean age of 26.99 years. The majority of the apprentices (89.6%) have been in the trade for 1–5 years. A breakdown of the apprentices by trade is shown in Table 1.

Data Analysis

There are two types of concepts that are recorded in this study. First is the record of the single item such as quality of performance. The respondent's score was recorded on a single item scale. As a result, a person's score on such a scale was simply the response they chose. The second type is the more complicated concepts that were measured on multiple-item scales. In this case, several related items were combined statistically to form a single scale in which the items were weighed to represent their relative importance to the scale. Thus, a respondent's score on the multiple-item scale is not represented by the respondent's responses to the individual items, but instead is a composite score which is computed by multiplying the respondent's response to an item score by that item's mathematical weight on the scale and then summing those products for all items comprising that specific scale.

The statistical procedure that makes it possible to create composite scales is called factor analysis. It is because of this that we used factor analysis to do all our analysis. This procedure allows us to identify a scale by revealing the items that combine to make up the scale and the weightings to be used in constructing the respondent's score on that composite scale.

Means and correlations are reported in this analysis. Because of limitation of sample size, no statistical conclusions are drawn based on gender as out of 201; only 13 respondents indicated their gender as female. ANOVA is not performed on gender-based and ethnic-based analyses as sample distribution is not strong enough to draw conclusions based on these comparisons and hence the mean values are reported as findings and no conclusions are drawn based on these comparisons. No attempt was made to seek relationships between variables as it was not necessary to conduct regression analysis.

Sample Limitations

A limitation of this study is that the responses from the various trades that were contacted are not evenly distributed. The electrical trade accounted for 58.76% of the responses whereas the other trades (asbestos workers, painters, roofers, brick layers, carpenters, cement masons, plasterers, and tile marble and terrazzo helpers) combined accounted for 41.24%. No attempt was made to compare the responses from the various trades. As a result, we are reporting the responses from each trade.

Findings

Effort

The amount of effort expended on a job by an individual was measured by the worker's agreement or disagreement with the statement, "I work hard." Workers were asked to answer the same on a scale of 1–7, with 7 being "strongly agree" and 1 being "strongly disagree." The level of effort reported was higher, 0.904 out of 1. The mean for effort reported by female apprentices is 0.96 whereas that of male apprentices is 0.90. The mean value of effort for "white" workers was 0.90 whereas it was 0.63 for "black." The mean values for effort were 0.90 for workers in the age group of 18–29, 0.92 for those in the age group of 30–39, and 0.93 for workers in the age group of 40–49. It was observed that there was not much difference in the mean values for effort with age.

Effort was strongly correlated to general job satisfaction. ($r=0.79$ and $p<0.01$), and weakly correlated to intrinsic satisfaction ($r=0.28$ and $p<0.01$), and negative expectancy ($r=0.22$ and $p<0.00$). Effort also was significantly correlated to quality of work ($r=0.16$ and $p<0.03$) but was not significantly correlated to quantity of work. The data on effort is as expected. Apprentices are more interested in learning the trade and producing quality work. With time, they will begin to produce a large quantity of work. They seem to be satisfied with the level of effort they are exhibiting. Table 2 shows mean values of effort by primary trade of the respondent.

Performance

In order to measure the performance of a construction apprentice, workers were asked to respond to two questions, i.e., "In general, do you do large quantities of work?" and "In general, do you do quite high quality work?" The responses ranged from a 1, meaning "no, I don't" to a 7, meaning "yes, I do." The mean values of the two measures of performance, quality and quantity as re-

corded are 0.85 and 0.81 out of 1.0, respectively. The mean values for quality and quantity for female apprentices were 0.86 and 0.78 whereas these values for male apprentices were 0.85 and 0.81, respectively. There was no difference between mean values for performance by female and male apprentices. However, the values differed significantly by ethnic background. Mean values of quality and quantity for black were 0.81 and 0.77. For white the mean values for quality and quantity were 0.87 and 0.81, respectively.

Quality and quantity are strongly correlated ($r=0.50$ and $p<0.01$). Quality of work was also correlated to general job satisfaction and positive intrinsic instrumentalities ($r=0.22$, $p<0.00$ and $r=0.25$, $p<0.00$, respectively). Quantity of work was correlated with intrinsic satisfaction ($r=0.22$ and $p<0.00$), and positive intrinsic instrumentality ($r=0.19$ and $p<0.01$). Quality of work and quantity of work were weakly correlated to motivational score.

Expectancy

Expectancy was measured with a set of questions designed to find out if working hard leads to better performance. Responses were recorded on a 1–7 Likert scale with, 1 indicating "never" and 7 indicating "always." The items loading the expectancy factor are listed in Table 3. Using factor analysis we obtained means for expectancy as 0.78. The range for expectancy was from 0.35 to 1. Expectancy varied by gender. For female apprentices, mean expectancy was 0.85 whereas for male apprentices it was 0.77. Expectancy did not vary much by education, and it is almost the same irrespective of whether the respondent attended college or technical school. Table 4 is the breakdown of expectancy by primary trade of respondent. Expectancy was correlated with intrinsic satisfaction ($r=0.20$ and $p<0.00$) positive and negative instrumentalities and job clarity.

Instrumentality

Participants were asked questions about the likelihood that they would receive a particular job outcome if they did their work exceptionally well or exceptionally poor. The respondents were asked to respond to these questions on a 1–7 Likert scale, with 1 implying "not at all likely" and 7 implying "extremely likely." Five factors were identified from the factor analysis: positive intrinsic, positive extrinsic, positive opportunity, negative intrinsic, and negative extrinsic instrumentalities.

From the means, it was observed that apprentices reported higher positive intrinsic, moderate opportunity, and low positive extrinsic instrumentalities. The mean values varied significantly by gender of the respondent, ethnic background, primary trade of the respondent, age group and number of hours worked per week. As the age of the respondent increased the mean values for positive extrinsic and positive opportunity instrumentalities decreased.

Further, positive extrinsic instrumentalities were correlated to positive intrinsic instrumentalities ($r=0.23$ and $p<0.00$), positive opportunity instrumentalities ($r=0.54$ and $p<0.01$), individual growth need strength ($r=0.22$ and $p<0.00$), and motivational score ($r=0.53$ and $p<0.01$). Positive extrinsic instrumentalities were negatively correlated with the age of the respondent ($r=-0.23$ and $p<0.03$).

Positive intrinsic instrumentalities were correlated to quality and quantity of work. It was also correlated to general job satisfaction, intrinsic satisfaction, positive expectancy, and positive opportunity instrumentalities. Positive intrinsic instrumentalities were related to growth need strength ($r=0.41$ and $p<0.01$), and motivational score ($r=0.65$ and $P<0.01$). It was negatively correlated to the age of the respondent ($r=-0.23$ and $p<0.00$). Positive opportunity instrumentalities were correlated to intrinsic satisfaction, positive, and negative instrumentalities. It was weakly correlated to growth need strength ($r=0.24$ and $p<0.00$), and strongly correlated to motivational score ($r=0.70$ and $p<0.01$), and was negatively correlated to the age of the respondent ($r=-0.27$ and $p<0.01$). Table 5 shows means of positive instrumentalities by different demographic variables.

Negative Instrumentalities

During the analysis of negative instrumentalities, it was observed that the mean for negative extrinsic instrumentalities was 0.71 and the negative intrinsic instrumentalities were 0.67. It differed by the gender of the respondent, ethnic background, primary trade of the respondent, and age group. Mean values for negative instrumentalities decreased as number of years in trade increased.

Negative extrinsic instrumentalities were correlated to intrinsic satisfaction ($r=0.23$ and $p<0.00$), positive expectancy ($r=0.25$ and $p<0.00$), positive intrinsic instrumentalities ($r=0.39$ and $p<0.01$), positive opportunity instrumentalities ($r=0.30$ and $p<0.01$), and negative intrinsic instrumentalities ($r=0.74$ and $p<0.01$). A weak correlation was found between negative extrinsic instrumentalities and growth need strength ($r=0.25$ and $p<0.00$), and also between negative extrinsic instrumentalities and motivational score ($r=0.42$ and $p<0.01$). Negative intrinsic instrumentalities were correlated to factors such as growth need strength ($r=0.25$ and $p<0.01$), and motivational score ($r=0.36$ and $p<0.01$). Table 6 shows negative instrumentalities by different demographics.

Satisfaction

Overall satisfaction was measured using general job satisfaction and intrinsic satisfaction, i.e., satisfaction with work. The questions were scaled from 1–7 with 1 indicating strongly disagree and 7 indicating strongly agree. The mean for general satisfaction was 0.87 and for intrinsic satisfaction it was found to be 0.77. It did not differ significantly by gender. General job satisfaction increased as number of hours worked per week increased. It varied significantly by primary trade of the respondent. General job satisfaction was highly correlated to effort ($r=0.79$ and $p<0.01$), and weakly correlated to quality of work ($r=0.22$ and $p<0.00$). It was not significantly correlated to quality of work ($r=0.16$ and $p=0.03$). This appears to be the rational for an apprentice since they would focus on quality rather than quantity of the output. As experience is gained performance will result in higher quantity of output. It was also correlated to intrinsic job satisfaction.

Intrinsic job satisfaction was correlated to effort ($r=0.28$ and $p<0.01$), and quantity of work ($r=0.22$ and $p<0.00$). It was not as strongly correlated to quality as quantity ($r=0.15$ and $p<0.05$). It was correlated to positive expectancy and positive instrumentalities. Intrinsic satisfaction was also correlated to individual growth-needs strength and motivational score. Table 7 shows a breakdown of general job satisfaction and intrinsic satisfaction by demographic variables.

Motivational Effects

The level of motivation of apprentices is calculated using three parameters: Expectancy, instrumentality, and valance. The score was computed by combining the expectancy score that was obtained for each worker with a score representing the degree to which workers perceived that they were receiving important out-

Table 3. Significant Loadings for Factor Scales

Scale and determinant items	Mean	Weight
Expectancy		
Working hard leads to good job performance	5.74	0.29
Working hard leads to gaining respect from co-workers	5.42	0.18
Working hard leads to doing my work well	5.54	0.16
Working hard leads to better treatment by co-workers	4.98	0.19
Working hard leads to better treatment by foremen	5.60	0.17
Working hard leads to high productivity	5.57	0.10
Working hard leads to friendliness from co-workers	4.66	0.09
Negative expectancy		
Working hard leads to losing friends at work	5.37	0.59
Working hard leads to pressure from co-workers not to work so hard	5.08	0.36
Positive opportunity instrumentalities		
You will have more freedom in your work	4.91	0.29
You will have better job security with the contractor	5.21	0.16
You will get a better work assignment	4.70	0.21
You will be given chances to learn new things	5.42	0.18
You will have more employment opportunities with other contractors	4.82	0.13
Positive intrinsic instrumentalities		
You will feel better about yourself as a person	5.64	0.26
You will have an opportunity to develop your skills and abilities	5.63	0.55
You will get a feeling that you have accomplished something worthwhile	5.58	0.19
Positive extrinsic instrumentalities		
You will get a bonus or pay increase	3.06	0.35
You will be praised	4.08	0.25
You will be promoted	3.82	0.25
You will work yourself out of a job	3.28	0.11
Negative extrinsic instrumentalities		
You will get poorer work assignments	5.14	0.27
You will be among the first to be laid off	5.37	0.25
You will not be given more freedom in the future	4.91	0.15
You will be criticized	5.27	0.09
You will be fired	4.43	0.09
You will not be given the opportunity to learn new things in the future	4.53	0.13
You will have fewer employment opportunities with other contractors	4.87	0.09
Negative intrinsic instrumentalities		
You will work longer on a project	3.87	0.03
You will not be given the opportunity to develop your skills and abilities	4.64	0.39
You will not feel good about yourself as a person	4.99	0.27
You will not get a bonus or a pay increase	4.26	0.12
You will not get promoted	4.74	0.15
General job satisfaction		
I get a feeling of personal satisfaction from doing my job well	6.35	0.15
All in all, I am satisfied with working in my trade	5.88	0.25
Doing my work well gives me a good feeling	6.33	0.23
In general, I like working at my trade	6.07	0.37
I feel bad when I do poor work	6.06	0.06
In general, I do not like my trade (reverse coded)	6.02	0.04
Intrinsic satisfaction		
I very much like the type of work I am doing	5.48	0.47
My work gives me a chance to do the things that I do the best	5.28	0.35
My work gives me a feeling of pride in having done the job well	5.48	0.08
My work is my most rewarding experience	4.86	0.05
Job clarity		
My work has been clearly explained to me	5.11	0.48
I feel certain about how much authority I have in my work	4.85	0.16
I know exactly what is expected of me in my work	5.28	0.06

Table 4. Expectancy by Primary Trade of the Respondent

Trade	Expectancy
Asbestos workers	0.83
Electric workers	0.76
Painters	0.92
Roofers	0.79
Others[a]	0.78
Average	0.78

[a]Includes brick layers, carpenters, cement masons, plasterers, and tile marble and terrazzo helpers.

comes as a result of performance. The items describing consequence of good performance are multiplied by the workers reported importance of the outcome. The composite valance-instrumentality (*V-I*) scores were summed for each worker and multiplied by the workers' expectancy score. The resulting motivation score reflected the net effect of the expectancies, instrumentalities and valances reported for each worker.

The level of motivation, 0.47, was low among apprentices. The mean motivational score for female apprentices is 0.57 and that of male apprentices is 0.46. It was observed that motivational level decreased as age of the apprentice increased. The values of motivational score for age groups are shown in Table 8.

Motivation was significantly correlated to a number of factors. It was correlated to intrinsic satisfaction ($r=0.32$, $p<0.00$), and expectancy ($r=0.72$, $p<0.00$). It showed significant correlation with positive and negative instrumentalities. Motivation was correlated to individual growth-needs strength ($r=0.33$, $p<0.00$), and negatively correlated to the age of the respondent ($r=-0.32$, $p<0.00$). Table 9 shows motivational score by demographics.

Discussion

This study is beneficial to both researchers and professionals in the construction industry. The motivational climate provides researchers with a framework on which they can conduct an in-depth study of motivational climate of construction workforce.

Table 5. Positive Instrumentalities by Demographics

Demographics	Positive extrinsic	Positive intrinsic	Positive opportunity
Gender			
Male	0.51	0.80	0.72
Female	0.57	0.90	0.72
Ethnicity			
Black	0.49	0.74	0.64
White	0.52	0.82	0.73
Other	0.43	0.69	0.62
Trade			
Asbestos workers	0.62	0.80	0.78
Electric workers	0.49	0.82	0.71
Painters	0.55	0.85	0.71
Roofers	0.51	0.70	0.70
Others[a]	0.54	0.80	0.70

[a]Others include brick layers, carpenters, cement masons, plasterers, and tile marble and terrazzo helpers.

Table 6. Negative Instrumentalities by Demographics

Demographics	Negative extrinsic instrumentalities	Negative intrinsic instrumentalities
Gender		
Male	0.70	0.66
Female	0.84	0.79
Ethnicity		
Black	0.76	0.67
White	0.70	0.67
Other	0.62	0.65
Trade		
Asbestos workers	0.68	0.65
Electric workers	0.73	0.68
Painters	0.76	0.74
Roofers	0.61	0.61
Others[a]	0.71	0.67

[a]Others brick layers, carpenters, cement masons, plasterers, and tile marble and terrazzo helpers.

Findings from such a study will be useful for constructors in their quest to maintain motivated workforce in particular, apprentices.

This study demonstrated that the expectancy theory is applicable in the construction industry. Our findings generally support what the theory predicts. The expectancy theory suggests that expectancy should have a stronger relationship with effort and performance. However, we found that negative expectancy was strongly correlated with effort. The possible explanation to this could be because we were studying construction apprentices. Our findings make it imperative that we should select individuals who are interested in the construction trade and define the task they are to perform clearly.

Instrumentality, according to the theory, should have a strong relationship with performance and satisfaction. We found this to be the case. However, we observed that effort was not correlated with instrumentalities. The theory also suggests that the valance-instrumentality score should be correlated with satisfaction. This is proven to be true in this study.

The generalized measure of motivation was found to be cor-

Table 7. Satisfaction Variables by Demographics

Demographics	General job satisfaction	Intrinsic satisfaction
Gender		
Male	0.87	0.77
Female	0.90	0.79
Ethnicity		
Black	0.88	084
White	0.87	0.75
Other	0.87	0.79
Trade		
Asbestos	0.85	0.81
Electric workers	0.88	0.76
Painters	0.92	0.74
Roofers	0.84	0.74
Others[a]	0.89	0.77

[a]Others include brick layers, carpenters, cement masons, plasterers, and tile marble and terrazzo helpers.

Table 8. Motivational Score by Worker Age Group

Age group	Mean
18–29	0.50
30–39	0.41
40–49	0.39
50–60	0.22
Total	0.47

Table 9. Motivational Score by Demographics

Demographics	Motivational score
Gender	
Male	0.46
Female	0.57
Ethnicity	
Black	0.42
White	0.47
Other	0.31
Trade	
Asbestos workers	0.52
Electric workers	0.45
Painters	0.55
Roofers	0.42
Others[a]	0.51

[a]Others include brick layers, carpenters, cement masons, plasterers, and tile marble and terrazzo helpers.

related to quantity and quality of performance. The more motivated apprentices (as evidenced by higher motivational scores) reported higher scores on effort and performance. What needs to be done is to develop a mechanism for selecting those apprentices that are interested in the trade. The image campaign going on by the industry may help in attracting individuals who are interested in construction trades.

There has been interest in the industry in recruiting women into the crafts. Although our study is limited, and hence our findings may not be generalized, it is nonetheless noteworthy to state that the few women in the study reported higher quantity and quality of work. There was no basis to conduct further investigations about the significance of the response from the few women in the study because they accounted for 6.34% of the sample. Rather, it may be interesting to conduct an in-depth study on women apprentices. Such a study will help shed light on how to motivate more women and their perceptions of the industry when in training.

From our study of apprentices using the expectancy theory, we believe that three issues need further researched study in the industry. The first is what energizes behavior, second is what directs behavior, and third is what sustains behavior. Because we are studying apprentices, it is important that they are energized with good directions that involve clarification of what they are expected to do and providing the environment that sustains that behavior.

The apprentices come to the industry with some level of expectation. This is generally to complete their apprentice program and move into journeyman status. Because of this, it is our view that industry should find ways to energize the apprentice as they learn their various trades. The apprentice can be energized by providing them with tasks that are challenging and establishing clear and achievable expectations from them.

To direct the behavior of an apprentice such that they engage in the desired behavior implies that their foreman must be able to provide clear directions to them when they are assigned a new task. They may be included in the discussion of the scope of work, the reasons why they are expected to perform the task in a certain way and the safety implications. By involving them in the scope of work, it is expected that it will motivate them to perform well.

Finally, sustaining the desired behavior implies that the foreman must ensure that the environment is conducive for the desired behavior. For example, the foreman must ensure that the apprentice is not ridiculed for trying or scolded publicly. Their co-workers and other journeymen with whom they work must be encouraged to be sensitive to the apprentice as they learn their trade. Simple praise by the journeymen and the foremen will go a long way in encouraging the apprentice to engage in the desired behavior.

The things that can be done to help improve the motivation of the apprentice are not all expensive. Praises for jobs well done, involvement of apprentices in discussing next assignments, and providing them with the current equipment are all simple things that can help improve the motivational score which is low at this time.

Thus, in summary, expectancy theory provides a more in-depth model of workers for managers to work with. The model has been demonstrated to be effective in the understanding of motivation of individuals and the design of organizational systems. It makes a critical demand on management to determine relevant forces in the individual and in the environment that will lead to specific worker behavior.

Conclusions

The performance of the apprentice is an important issue in developing a quality workforce. To influence apprentice behavior and performance, then, management must have an understanding of their motivation, the factors which influence them to come to work, to work hard, and to work well. It is a complex model like the expectancy theory that offers promise to understanding the nature of behavior. The findings from this study should form the basis for a more comprehensive study of the construction apprentice. An in-depth study that will focus on both union and nonunion sectors is needed. Such a study will help in designing programs and strategies to enhance the experiences of construction apprentices. This is particularly important as the apprentices are the pipe line for the future workforce.

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