

SPARSH JOHARI

Entry No. 2016CEZ8424

RESEARCH SCHOLAR
INDIAN INSTITUTE OF TECHNOLOGY DELHI

ORCID id: <https://orcid.org/0000-0002-1396-0188>

Email id: sparshjohari@yahoo.co.in

Contact No.: +91-7827060976

Thesis Title

Effect of socioemotional, cognitive, and technical competencies of workers on construction labor productivity

ABSTRACT

A construction worker is a worker employed in manual labor of the physical construction of the built environment and its infrastructure. In terms of working hierarchy, construction workers belong to the lowest most strata of the construction industry. They are directly involved in performing the tasks at site, and thus their level of competency plays an important role in defining construction labor productivity. The construction labor productivity (CLP) is a single-factor productivity, where labor hours are used as the input unit and the quantity of finished work as output. Therefore, to enhance the performance of the workers by improving their specific competencies, workplace training systems have been developed. In such training systems, workers learn working methodologies, new technologies, and the way to work at site. These training systems have fixed training curriculum and training time. However, these training systems have one major constraint, that is, the outcome of such trainings in terms of the percentage of increase in workers' performance is not generally measured. This lack of measurement causes two issues. First, the contractors are not able to recognize the importance of training in enhancing workers' performance and second, the training providers do not receive constructive feedback on the efficacy of their training sessions.

This study therefore attempts to bridge this gap by conducting a nationwide survey of 598 industrial professionals in India, to identify six, nine, and thirteen competencies for unskilled, semi-skilled, and skilled categories of workers, respectively, which affect their performance at site. These competencies included behavioral attributes, motivation, and physical strength for unskilled workers; self-confidence, and technical knowledge for semi-skilled workers; and writing, reading, mathematical, and problem-solving competencies for skilled workers. Further, the author quantified each of these competencies of the workers at construction site using survey instruments, which were identified through literature. Along with the measurement of the competencies, the productivity of the same workers was also measured via direct observation at sites. By applying various best-fit curve models to the collected data (measured competencies and productivity), best-fit curves were developed between each of the competencies and observed productivity. Subsequently, a regression model was developed by considering all the measured competencies as explanatory variables and productivity as dependent variable. Thereafter, the author visited four training centers in India and measured all the identified competencies of 137 trainee workers periodically (every 2 days of a 90-day training). This periodical data on competencies of the workers was fed into the developed regression model to compute their performance increment during their training. Subsequently, a learning curve was drawn between the performance increment of the workers and their training time. In addition, the competencies versus training time curves were also plotted to understand how competencies of the workers were enhancing during their training.

The results indicate that workers' performance after training was far below the desired level of employers; the reason for this emerges from competencies versus training time curves, where it was found that training does not focus on enhancing socioemotional and cognitive competencies. Therefore, the study recommends that training providers incorporate these

competencies in training curriculum to achieve more desirable outputs from the training. This will help in designing and implementing an effective workers' training program.

Keywords: Construction labor productivity, correlation analysis, path analysis, regression analysis, skill development training, worker skills