

Training Needs Analysis (TNA) for Construction Projects: A Review

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Abstract:- Training needs analysis (TNA) determines the gap between 'what is' and 'what should be' situations. Construction industry is very important for progress, development and economic growth of a country and therefore the task of analysing training needs in construction projects is very important aspect in the present scenario of construction industry. Literature was referred to study the training needs analysis in construction projects. TNA has become very important branch in almost every field. As for as construction projects are concerned a lot of work has been carried out internationally but in India TNA has not been applied much in building construction sector. In this study forty seven papers, published between year 1993 and 2015, have been surveyed. These papers are further classified in five sections. Papers based on past theoretical studies are presented under review papers section. TNA based on data collection by questionnaire, through interview, by particular case studies and remaining other methods are other classifications.

Key Words:- Training needs analysis, Construction project, Ethical issues, Relative Importance Index (R.I.I.), Spearman's rank correlation, 5- point Likert scale, Variables, Anova / Independent t-tests.

1. INTRODUCTION

A need assessment is a systematic exploration of gap between what things are currently in place and what they should be. A need analysis is a process in which needs are identified and broken into their component parts to determine the solutions of the problem. Construction industry is very important for progress, development and economic growth of a country and therefore the task of analyzing training needs in construction projects is very important aspect in the present scenario of Indian construction industry. It is felt that construction industry is facing the problem of time overrun as well as cost overrun. Also persons related to construction work e.g. engineers, architects, contractors need to be provided training in the field they are lacking in knowledge. Literature was referred to study the training needs analysis in construction projects. Having studied various articles it can be said that training need analysis (TNA) is very important branch in almost every field. A lot of work has been carried out

internationally but in India TNA has not been applied much in building construction industry. In this study literature review of TNA of construction projects have been carried out under following head: -

(A) REVIEW PAPERS

This section comprises of papers where study of past literature have been conducted by authors. The paper written by Dahiya and Jha (2011) describes the importance of TNA and defines the term training needs assessment by quoting various views expressed by different authors. It says that needs assessment is an exploration of what is and what should be and thus to find out gap area where training can be given. Key areas, phases and levels are also discussed. It also explains various models of training needs assessment suggested by different authors. The paper also highlights the limitations and barriers to TNA stating that absence of training analysis is due to lack of expertise, not having a clear HRD plan, policy of section to handle employee's training and development. The study depicts that if needs analysis tied exclusively to training it could often be ineffective. The goal of article by Arthur et. al. (2003) is to address the gap of training effectiveness literature by conducting a meta-analysis of the relationship between specified design and evaluation features and the effectiveness of training in organization. Meta analysis quantitatively aggregates the results of primary studies to arrive at overall conclusion or summary across these studies. For this study, they reviewed the published training and development literature from 1960 to 2000. The paper identifies that the training methods used and the choice of training evaluation criteria are related to the observed effective programs but the limitation to meta-analysis of this study is that only those features over which researchers have reasonable control have been taken into consideration. Colquitt et. al. (2000) meta-analytically summarized the literature on training motivation, its antecedents and its relationship with training outcomes and defined training motivation as the direction, intensity and persistence of learning directed behaviour in training context. The purpose

of this article is to review and integrate this burgeoning literature by taking a first step towards an integrative theory of training motivation. As this study is based on the results of small sample sizes there is scope for further study in this direction which could be based on higher sample sizes. The aim of the article by Rodrigo and Abbad (2013) is to systematically review TNA scientific literature and to point out some possible developments. Database, website, wiley online library and 51 articles ranging from 1978 to 2010 were consulted. The paper reveals this fact that there is little concern with building concepts related to TNA and it suggests that TNA research should be based on measurable human competences gaps. Pollack (2007) analysed project management literature in order to identify paradigms associated with project management research. The hard paradigm is characterised by predefined project goals, realist philosophies and quantitative measures. The soft paradigm is characterised by ill-defined goals and qualitative measures. He argues that most of the current research is deeply rooted in the hard paradigm and there is more scope of research work in soft paradigms. Daniel Kelly and Isabel White (2004) accessed 266 nursing articles published between 1982 and 2002 via a number of databases. The outcome showed that trainings have the greatest potential for influencing service delivery and improving quality of care. Garavan et. al. (1993) reviewing some of the literature on 'power and influence' have highlighted a number of difficulties that confront the training and development function in using power and influence successfully in organizations.

(B) PAPER BASED ON QUESTIONNAIRES

This part deals with the papers where data were collected through questionnaire survey from various respondents and results were established. According to Chang et. al. (2012) training is a method to increase the working ability of employees. Training is one of the methods to solve organizational problems. In this study questionnaires were sent to actual HRD practitioners of Taiwan and 193 valid questionnaires were received back. HRD personnel were explained the necessity of TNA and factor influencing assessment were taught to them to find out real problems and their solutions. 193 HRD practitioners were regarded as research samples. The study used questionnaires and influential factor analysis of TNA was done. F-value significance etc. were calculated and a TNA model was developed. It was found that "mastering organizational development" was significantly related to organizational scale, and "capability for intervention" was significantly related to training performance. The paper by Teixeira et. al.

(2006) shows that a survey was conducted in 4 European countries i.e. Portugal, Poland, Spain and Lithuania on the needs of training in management of construction projects. A questionnaire was circulated and data were collected and analyzed. Training needs were assessed. The participants showed strong interest in the following area :-

1. Project conception development.
2. Planning and scheduling .
3. Cost estimation and management
4. Quality management
5. Procurement and tendering process.
6. Health and safety management.

The research was conducted by Akhavan and Abu Bakar (2009), sending 120 sets of question to the nominated companies of Mashhad, Iran. 52 sets were returned. Dependent variables were the quality of construction and independent variables were the factors related to training and motivation. A quantitative research approach was adopted. The research exposes some barriers like lack of experts, less support from the government in the training & development of the construction workers. Future research should be undertaken to address how companies and government adopt to shape the environmental and organizational settings in such a way that the context optimally stimulates workers motivation and participation in training courses and effects on increasing the quality of construction.

The aim of the paper by Odusami et.al. (2007) is to examine the specific training needs of construction site managers working in construction projects in Lagos State of Nigeria. A structured questionnaire survey was conducted. Out of 80 questionnaires, 36 were returned filled-up by participants. The data were analyzed using descriptive statistics. Mean score, weighted average, t-distribution were calculated. the study reveals that training of site managers should address more on human relations and project management. A questionnaire survey of 1000 top companies in Malaysia was conducted by Jamil and Md. Som (2007) to identify the methods to determine training needs. 278 questionnaires were sent and 84 were returned back. It states that due to rapid changes in today's environment and global competition there is urgent need to constantly train human resources. Jahange (2013) conducted a field survey to

identify causes of delay in construction projects in Baghdad city which contained a questionnaire with 58 causes of delay, categorized in 10 groups of causes. Participation were 78 engineers out of which 60 responded. The most serious causes of delay identified were- mistakes in design and ineffective planning and scheduling .As for as data analysis was concerned Relative Importance Index (RII) and Spearman's Rank Correlation was calculated to find out the causes of delay. The paper presented by Brown and McCracken (2009) deals with the issues related to barriers which managers face in respect of their participation in training programmes in Canada. Survey data from 137 canadian employees were collected. The findings show that lack of time and unsupportive culture was barriers in performing duties. The research by Castellanos and Martin (2011) was focused on Spanish business of more than 50 employees to study the effect of training on business results and to analyse the existing relationship between training and business strategies. It reveals that training has become one of the sources of competitive advantages for any business.

The study by Altarawneh (2010) describes the current HRIS (Human Resource Information System), uses, benefits and barriers in Jordanian Universities. A questionnaire survey was conducted and 174 participants were asked to indicate responses using five point Likert scale although 230 participants were targeted. F value, mean square, significance were calculated. The study shows that access to information was the main benefit of HRIS implementation.

Choo and Bowley (2007) collected data from 135 employees working at one of the largest bakery franchises of Australia. They found out that the effectiveness of a training program depends on training quality, learning experience of staff, course design and satisfaction of employees is influenced by company values, job responsibilities and work environment.

Al- Kazemi and Ali (2002) presented a study regarding managerial problems in Kuwait in which 762 managers participated. They found-out that favouritism at work, subjectivity in promotion, forcefully distribution of responsibilities, rigid administrative systems and multiplicity of rules and regulation were the most important problems in performing managerial duties. Solomon Bopape (2005) conducted a questionnaire based survey in South Africa to establish training and development needs of managers in academic libraries in performing human resource management activities and the respondent showed a need for training and development on activities related to

managing labour and employment relations. Wadalksr and Pimplikar (2012) by conducting a questionnaire based survey suggested an equation for competency required by project manager in the Indian construction companies so that areas of improvement can be served more efficiently.

Edum-Fotwe and McCaffer (2000) conducted a questionnaire survey in the U.K., 170 questionnaires were returned filled-in, out of 500. Questions related to scheduling cost estimating, plan execution were included. Results show that general knowledge and skill elements are essential for developing project management competency.

The paper by Rattray and Jones (2007) deals with the issue of raising awareness in respect of questionnaire design and development and present a series of decision making strategies at each stage of design steps. Through questionnaires data were collected in standardized manner from a representative sample of a defined population.

Duveml i. Ikediashi et. al. (2012) used structured questionnaire to collect data from two categories of respondents namely, the technical and managerial personnel in Nigeria. Findings reveal among others that there is a disparity in the training policies of most companies regarding different categories of staff and companies do not favour the technical personnel.

(C) PAPER BASED ON INTERVIEWS

In this section research work done by interview methods have been presented. The study by Pratiwi and Niam (2012) aims to get appropriate strategies to reduce the amount of unskilled workers in Indonesia. The data were collected through in-depth interviews and were validated by Delphi method and analyzed descriptively. The strategies that must, mainly, be implemented to improve the skills of construction labours are certification, standards and training and research.

(D) Papers based on case studies

This section shows the outcome of various case studies done previously on TNA. Bartel (1995) studied the relationship between on-the-job training and wage growth. For this study database was generated utilising the personnel records of a large manufacturing company in U.S.A. Record of employees for all branches of a company like engineering, finance, marketing, staff services, were studied . The result of this study shows that there is a positive and significant effect of training on wage growth

and a training leads to an important in job performance as measured by performance rating scores. Castro et. al. (2010) presented a conceptual framework and methodology and data analytic procedures for conducting research studies. It also presented illustrative examples from the ongoing integrative mixed methods research studies.

Ribeiro (2006) identified knowledge management processes and supporting technologies within a construction organization based on three case studies in Canada i.e. commercial mall project, subway station project, housing project using Effective Knowledge Management Systems. The paper emphasises that construction companies all over the world are increasingly being challenged by high cost pressure, shortened project cycles and increasing competition. It further states that a knowledge base is a dynamic resource that may itself have the capacity to learn, as part of an Artificial Intelligence (AI) .

Brandenburg et. al. (2006) proposed a two tier approach to workforce management in the United States. Tier-I is designed to improve the effectiveness and productivity of construction workforce through effective supervision and project management. An analysis of 19 on site project visits of industrial construction projects was done including surveys collected from craft workers and supervisors.

Toor and Ofori (2008) in their article presented the research agenda for leadership development in the construction industries of developing countries. It defines leadership, and the need for leadership in construction industries of developing countries. There is much need for leadership in construction industry development. It highlights the potential of leadership with respect to different research topics.

Atiyyah (1993) suggests that management development firms should adopt a growth strategy to tackle with major problems in management development programmes, design and implementation. The paper by Mselle and Manis (2007) describes necessity of training of site managers, as lack of leadership, accountability, training and knowledge creates problems during construction. Site managers, construction companies, consulting firms and clients suffer as a result of these problems. Emphasizing the need for training, the paper suggests objectives, structure and benefits of training programme. Training need assessment report was prepared on solid waste management (SWM) learning programme in India, by World Bank Institute (2006) and it was felt that there was need to improve the present system of solid waste management in the country. TNA was conducted in four

states i.e. Tamilnadu, Rajasthan, Gujrat and Madhya Pradesh through consultation with municipal officials. TNA objectives and methodology were consulted with Municipal & State Government officials, NGOs and HSMI officials. A questionnaire survey was also conducted, gaps were identified and the result was validated.

Udayakumar and Karthikethan (2014) presented a paper on career up-gradation of civil engineers through training and development at M/s URC construction (P) Ltd. India which describes BIM (Building Information Module), a concept for project planning, designing, analysis, monitoring, costing and data management in construction. The personnel were grouped in to 4 categories - fresher, 1 to 3 years, 4 to 7 years and more than 7 years experienced persons. On the job & of the job training module was designed. The paper states that all the construction industries should focus on their people development for their continuous career up-gradation.S EI-Sabaa (2001) presented a paper on the skills and career path of an effective project manager, which reveals the facts that project managers and functional managers differ in respect of experiences & skills. In this paper a conceptual framework is put forward for enhancing the performance of project manager.

Ebrahim Hemmtania (2005) presented a case study on "A project manager specialist in management or specialist in a topic area". This study expresses that project manager skills can be elaborated in three different categories: human, conceptual and organizational with technical skills. This case study describes crisis management through advanced geo information technology.

Rebeka Sultana Liza et. al. (2011) presented a case study on training needs analysis of banking sector in Bangladesh. Authors feel that appropriate tools must be used to identify training needs systematically to design training programme. Questionnaire and performance appraisal methods were used to collect data. Although performance appraisal method is less effective as it focuses only on present performance needs thus neglecting future organizational demands.

Okuntade Tope Femi (2014) explains in detail the rejection of null hypothesis & acceptance of alternative hypothesis pointing out that building construction technicians must be encouraged to undertake training and sufficient funds should be provided by the organizations. Also the techniques of training should be simple and plain.

Mahmood Asad and Joma Mahfod (2015) conducted a questionnaire survey in which 37 questionnaires were sent and 31 were received back. Cronbach's Alpha was calculated. The paper recommends that the company must pay more attention to training strategies and also need to focus on the modern technology.

Paul S. Chinowsky (2001) introduces a comparative study of the current strategic management practices in public & private organization that are responsible for constricting the built environment. The paper also introduces the areas that organizations must address to compete in the face of changing customer & competitor conditions.

Kazimierz et. al. (2006) stated in their paper that management qualification of construction staff is essential. The findings of the inquiries are an evidence that there is a gap between current educational profiles of civil engineers in respect of professionals need in the management field.

Robert K. Yin (2009) presented a case study on research designs and methods in which he stated that a case study is a strategy where "how" and "why" questions are asked and when the focus is on some real life phenomenon.

Marie C. Hoepfl (1997) stated that quantitative researchers seek causal determination, prediction, and generalization of findings, whereas qualitative researchers seek instead illumination, understanding, and extrapolation to similar situations.

Pilar jerez Gomez (2004) in his paper provides an in-depth study of the relationship between the company's training strategy and its learning capability on a sample of 111 Spanish companies from the chemical industry, tests a set of hypotheses which link four different training strategies with the learning capability dimensions.

Kelly Menzel and Sharon messina (2011) have focussed only on the initial stages of the needs analysis process: identifying the needs, identifying the gaps, drafting an educational resources development timetable.

Laskar and Murty (2004) in their paper have emphasized the need to employ innovative technologies and skilled project handling strategies to the Indian construction industry.

(E) PAPER BASED ON OTHER METHODS

In this section TNA methods other than that mentioned above have been included. Rabeb Mbarek and Ferid Zaddem (2013) stated that e-learning is advantageous for trainees as well as for organisations. The purpose of this research was to discover determinants of effective online training in Tunisia. However in India many people are not familiar with e-process hence e-training may be of less use but as awareness is increasing day by day e-learning can be proved very fruitful in near future. Anderson (1994) stated that the focus of training needs analysis is directly related to job performance. Anything which is lacking to perform a job successfully is a need.

II. CONCLUSION

The review of literature on training needs analysis enables us to take a view on the situation so prevailing in all sectors in general and construction industry in particular in the international scenario. It appears that all over the world the present scenario of construction industry is not satisfactory. Projects are being delayed resulting in the enormous increase in the cost. There are new challenges in assigned duties. New technologies are giving a tuff competition to co-op with. Environment is asking for the inclusion of new skill learning in training programs. There is a big gap between 'What is' and 'What should be' situation. In such scenario training needs analysis seems to be the only solution. It also appears from the literature review that questionnaire survey is a preferred method for data collection. In India nothing much has been done so far and there is an utmost need that training needs analysis must be done in respect of construction industry of India.

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