

**CONSTRUCTION SAFETY TRAINING Via E - LEARNING IN NIGERIAN  
CONSTRUCTION INDUSTRY IN ABUJA**

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**Abstract**

*E – Learning is the learning ways conducted through electronic media, such as CD, auxiliary software, interactive TV. E – Learning safety and health education and training helps to protect workers and prevent property loss caused by occupational disaster. E-learning for safety training and instruction in Nigeria has not been adopted widely in the construction industry. The aim of this paper is to understand the feasibility and current state of application of e – Learning for construction safety training in the Nigeria construction industry and identify its potentials. Therefore, this paper employed interview, test, questionnaire, observation, and document analysis to investigate learning effectiveness. Case studies of five construction organization with e – learning knowledge was conducted. The five construction organizations were selected through snowball sampling techniques. Content analysis was used in other to make effective inference from document content. Significant numbers of people do not have adequate internet services at the moment. Also small organization hurdles includes high quality online safety training services as it is expensive to implement and maintain. It is clear that such IT based e-learning is suitable for many aspects of safety training either as a standalone tool or in a blended approach, but more effort is required to fully utilize its potential. If e-learning is to succeed across the construction industry, there is need to assists small and medium size companies to access site induction and task specific on line training materials.*

**Keywords:** construction, e – learning, safety, training.

**Introduction**

The developments through the application of new technologies and innovations within the construction industries have increased the incidence of occupational injury. Domestic safety and health education helps to protect workers and prevent property loss caused by occupational disaster. Carrying out related occupation education and training will enhance workers skill and advance operation safety. According to Chung – Ling & Ren – Jye, (2010), that in Taiwan safety education training was instrumental in reducing the rate of accidents per thousand workers from 4.12% in 2001–3.61% in 2008, a reduction of 14.568%. Developed countries, including US, EU, Japan, and Taiwan have recently begun promoting e-learning to reduce the costs of educational training. Also, E – learning are the learning ways conducted through electronic media, such as CD, auxiliary software, interactive TV etc. The online learning is conducted through the Internet to achieve the interaction among learner, course, and teacher. E-learning indeed is a form of online learning. Therefore, the online learning is called e-learning or web-based learning at present. E-learning for safety training and instruction in Nigeria has not been adopted widely in the construction industry. E-learning has advantages such as flexibility to access the courses from remote construction sites at convenient times and ability for it to self-pace and interrupt the course to suit individual attention spans. Elke & Patrick, (2010), some of the disadvantages of e – learning includes high implementation cost and limited IT familiarities are issues for a large part of the construction industry. Also, availability of appropriate internet access, the need for computer literacy and a willingness to accept e-learning are issues for the learners. The aim of this research is to understand the feasibility and current state of application of e –



Learning for construction safety training in the Nigeria construction industry and identify its potentials, that is the effectiveness of e – learning.

### Literature Review

The "National Code of Practice for Induction for Construction Work" developed by the Department of Occupational Safety and Health (DOSH) of Ministry of Labor and Productivity sets a national standard for different types of induction required on construction sites. It specifies the following 3 modes of delivery:

- (i) General induction: 6 hours face-to-face training delivered by Registered Training Organizations (RTOs). Assessment is required.
- (ii) Site induction: There is no nominal duration; training should be delivered by a competent person. No requirement for assessment.
- (iii) Task-specific induction: Same requirements as for site induction.

Safety and education training must be provided onsite because construction machines and tools differ as most construction types requires onsite training. Occupational safety and health training embodies instructing workers in recognizing known hazards and using available methods for protection (Alexander & Michael, 1998). According to Chun – Ling & Ren – Jye (2010) that factors such as geographic conditions, time and cost determine whether constructors adopt simpler methods such as video teaching, to achieve a declaration of education training. The e-learning mode can often minimize training time and cost by delivering teaching materials and platform functions via Internet at any time and place (Chun – Ling & Ren – Jye 2010). Bostrom, *et al.*, (1990) argued that assessment of e-learning effectiveness must consider not only actual effectiveness in learning content, but also the attitude of the learner in the network learning environment. Gorman (1995) proposed that e-learning is technology-based training that can increase learning effectiveness.

### Research Methodology

This study tested the effectiveness of e-learning for delivering construction safety education training and how to assess its effectiveness. Holcomb (1993) proposed seven methods of assessing learning effectiveness, including interview, test, questionnaire, observation, document analysis, scenario analysis and action plan etc. Therefore, this paper employed interview, test, questionnaire, observation, and document analysis to investigate learning effectiveness. Telephone interviews were undertaken with DOSH representative, registered training organizations and safety professional institute all within Abuja. Case studies of five construction organization with e – learning knowledge was conducted. The five construction organizations were selected through snowball sampling techniques. The key issues investigated in the case study through content analysis included literacy, poor learning, computer literacy, effectiveness of delivery, flexibility, engagement and competency test, In content analysis method numerous materials can be analyzed and explained systematically and statistically. Kerlinger (1985) described content analysis as a systematic, objective, and quantitative research method, its purpose is to measure examine the parameters upon propagating. Weber and Specht (1997) also argued that "the content analysis method is a research methodology, namely a group of procedure to make effective inference for document content.

### Results and Discussion

#### Government Departments' Perspective and Practice of e-learning versus Face-to-Face Training



Recently, Department of Occupational Safety and Health (DOSH) have accepted online delivery as an accredited method for their general induction courses. But most construction companies insist on face-to-face training which is often combined with a video screening or power point presentation delivered by the trainer. Representatives from DOSH stated that the reason for the introduction of online delivery for the general induction safety course was the possibility to get workers through the certification process faster. But DOSH is unable to determine what percentage of general induction cards issued is obtained via e-learning.

**Registered Training Organizations (RTO's) E-learning Perspective and Practice**

RTOs include training companies and industry associations and group training providers. Telephone interviews were conducted with 5 RTOs delivering general induction training in Abuja in relation to their mode of delivery as shown in Table 1. The largest training company interviewed offer online training courses. Their online packages are well received by their clients. Also, two small training providers prefer face-to-face training. RTOs believe that face-to-face situations are better due to poor internet network and level of workers understanding. Also another, group of training provider and an industry association on't offer online training for general induction, as they believe face-to-face training is more appropriate and provides a better outcome. No blended approach is offered by any provider, which is very successful for applicants with poor English language skills or learning difficulties.

**Table1 Interview Summary of RTOs providing General Induction Training**

RTO	Type of Organization	size of Training Organization	Course options offered			Application using online courses	Comments by training provider
			online	Face - face	blended		
RTO1	Training company	Large	•			100%	Online training is better than face-to-face because the learner can interrupt the online course according to attention span.
RTO2	Industry Association	Medium		•			- There is insufficient internet coverage, - Face-to-face provides a better result than online.
RTO3	Training company	Small		*			Don't know enough about online course to comment
RTO4	Training company	Small		*			Face-to-face is better option because: - Learners can get better assistance if they have questions. - People with learning difficulties can get better help;
RTO5	Group Training Provider	Small		*			Face-to-face is better because, - Learners can get better assistance if they have questions. - People with learning difficulties can get better help, - Better knowledge verification

Source: Researcher Analysis, (2018)



### **Institute Perspective and Practice**

In Abuja, Institute of Safety Professional of Nigeria (ISPoN), play a major part in safety training of apprentices. They provide certified general induction as well as task specific induction. Information on the acceptance of e-learning for task specific safety training by ISPoN teachers and students is difficult to determine as safety is integrated in the overall course. When a teacher in the institute was contacted, the comment was that all the teaching is face – face because most of the teachers are not familiar with e – learning technology. Also, there is resistance to the use of e – learning by the management due to lack of adequate fund and poor internet by serviced provider. The institute was of the opinion that students/apprentices will respond well to e – learning and teaching could be made effective by using a blended approach.

### **Employer's Perspective**

Five (5) construction companies were contacted to gain an understanding of the level of online safety training undertaken by their company. To what extent e-learning is used for site and task specific induction is unclear. Only two large construction companies' has embraced the use of the internet. Lack of response from the rest has resulted in a literature review. A survey by Bloom (2003) on e-learning in Canada lists the use of e-learning for OH&S as the second lowest of 7 categories used in 570 organizations surveyed. Mack Consulting Group (2007, cited in Callan and Fergusson, 2009) investigated the uptake of e-learning in the small business. They found that on-the-job informal training is predominant in the small business sector. Key factors discouraging the uptake of e-learning by small business include the time, cost, concerns about effectiveness and a perceived lack of relevance to their business.

### **Conclusion and Recommendation**

It is clear that such IT based e-learning is suitable for many aspects of safety training either as a standalone tool or in a blended approach, but more effort is required to fully utilize its potential. As a significant number of people do not have adequate internet services at the moment. Also small organization hurdles includes high quality online safety training services as it is expensive to implement and maintain. Construction training via e-learning can make a valuable contribution to construction safety. If e-learning is to succeed across the construction industry, there is need to assist small and medium size companies to access site induction and task specific on line training materials. The institute of safety professionals needs to look more closely at the possibilities of overcoming shortcomings of current e-learning approaches for general induction safety.

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