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Framework for Craftsmen Training for Sustainable Development in the Construction Industry in Nigeria

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Abstract

Craftsmen find it difficult to perform, despite their involvement in project operations towards sustainable development in the construction industry, due to inadequate training needs. In order to sustain craftsmen rewarding operations to remain focused and relevant for better performance, this paper, examined and analyzed the existing training offered to the Nigerian construction craftsmen with a view to developing a craftsmen training needs framework for adequate and effective training of construction craftsmen for sustainable development in Nigeria. Methodology involves extensive review of related literature on craftsmen training, theories and training frameworks in construction industry. The findings of the study revealed that the efficient craftsmen training for the construction industry consist of seven critical areas. This is based on the level of importance placed by construction organizations in ensuring that adequate emphasis is placed on the appreciation and development of the workers to totally benefits from the training. This study further developed efficient framework needed for training of construction craftsmen towards achieving sustainable development in the construction industry in Nigeria. The practical implication reveals that, constructions organization trainers, managers, and educators should adopt this practical framework for adequate training of construction craftsmen. This will significantly promote better performance in the Nigerian construction industry for sustainable development.

Keywords: *Construction, Craftsmen, Training needs, Framework, Sustainable development.*

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Background to the Study

The construction activity is labour-intensive that requires continuous training and upgrading of craftsmen on the current technological advancements in order to remain relevant and effective in productivity for sustainable development of the construction industry (Jarkas, *et al.*, 2014)**.** Akpan (2022) views sustainable development as being associated with development that meets the needs of the present without compromising the future needs. Therefore, training in construction industry remain a central point in expanding the capacity of craftsmanship, through creation, maintenance and development of the construction craftsmen, which have contributed significantly to the achievement of construction project objectives for sustainability. Whereas, construction sector remains the highest employers of the nation's workforce beside agriculture, the industry is however, challenged in training needs that are core of expansion and upgrading of craftsmen's capacity thus resulting in sub-standard of workmanship, prolonged completion time and increased cost of the projects (Ade, *et al.*, 2015). Meeting the training needs of every workforce in the construction industry is a major challenge.

Nigerian craftsmen are skilfully gifted with numerous talents and manpower but mostly remain dormant, ineffective and unproductive due to inadequate training on current innovations in order to remain relevant and competitive in their respective field in today's construction world (digitalised world). World bank (2012) ranked Nigeria as the 5th largest infrastructural stock among the Africa countries with average capital growth rate of about 12% per annum but become unstable since year 2000. Nyoke **(**2007) and Ekanem, *et al.,* (2019) observed that, craftsmen services remain significant to the growth and development of any nation and this can only be acquired through grassroot efficient training and empowerment. Craftsmen training remain paramount because the construction activity is a continuous process rather than a one-time activity that take place once in the life cycle of the project (Ranasinghe, *et al.*, 2012).

What hindered good performance in Nigerian construction industry include: ineffective training needs schemes, poor working environment, lack of motivation, lack of health and safety measure, and poor site management (Robles *et al.*, 2014, Ho 2016., Raw'altigazl and Amman-Jordan (2021). Kaming *et al.,* (2015) study revealed that, the majority of our nation's youth no longer show interest and willingness in skill acquisition, due to low wages, absence of a clear-cut career path, and lack of apprenticeship training needs schemes. Also, the aged and retiring site operatives are not wishing their sibling would suffer this unfair treatment, rather, their children become consultants, managers and engineers. The unskilled labour affects project performance (costs and time) thereby jeopardy the expected economic benefits (Powl & Skitmore 2005). Improvement of quality productivity can only be achieved when craftsmen are trained and re-trained to become knowledgeable, skilled, sound mind and equipped with physical health and safety aids. Training promotes efficient and effective productivity, huge financial savings, more affordable housing with shorter construction periods, higher return on investment (ROI) and makes economic development become feasible (Iro *et al.,* 2016). Considering these enormous benefits, there is needs for training and re-training of the craftsmen in the construction industry. Undiyanadeye and Otu (2015) term such effort as a

mean of rescuing street and ghetto youth, especially the homeless and unemployed from drug abuse, gangsterism, kidnapping, crime/violence and other social vices for sustainability.

In Nigeria, there is a strong widespread crises of low construction craftsmen performance which have been traced to inadequate and substandard training and unfair treatment of craftsmen (Oseghale *et al.,* 2015). As a result of these negative dispositions toward craftsmanship, the younger generation deliberately avoid the hard-end construction trades in exchange for the lure of promising positions in the society; this drastically dropped in the strength of trained craftsmen in construction sector in Nigeria. Hence, the needs for training and re-training of craftsmen in construction industry becomes very essential in order to create enabling environment that stimulate required knowledge and competency for sustainable development.

A number of research gaps on the framework for training needs of craftsmen have been identified in the construction industry worldwide. For instance, Hassan (2008) developed best practice training framework for Malaysia construction workforce being the bedrock of this study. Odusami and Ene, (2011), Okoye and Chijioke, (2013), observed that, most of the craftsmen training framework were unstructured and unified. Others investigated the effect of short course and seminars as the training strategies on the performance of craftsmen in Tanzania (Rebecca, 2020). In Nigeria, Olatunji*, et al.*, (2015) investigated the effects of formal and informal training of craftsmen on productivity in southwestern Nigeria, in which an increased productivity was recorded through motivation and incentives to workers.

Aim and Objectives

Framework for training needs of craftsmen in Nigeria seem scarce, based on the aforementioned studies, this study therefore, aims at developing efficient framework for the training needs of craftsmen in the Nigerian construction industry with a view to promoting effective craftsmen performance. The objectives are to examine and analyses the existing training offered to the Nigerian construction craftsmen, and to develop effective framework for the training needs of craftsmen in the construction industry in Nigeria.

Craftsmen in Nigerian Construction Industry

Construction craftsmen are skillfully and manually operatives that contribute practically to the realization of a given construction projects (Namala & Saliku 2016). Construction is the best sector for stimulating employment for both higher and lower skilled workers who have relatively few alternative opportunities and dependent on construction jobs. Construction is not only immediate production; it is also investment which provide significant long-term economic and social benefits for the citizen. Griggs *et al.,* (2016) divide structured labour force in the construction sector into two categories: skilled and unskilled. Explaining further that, skilled men are of varying abilities ranging from apprentices to beginners who are willing and interested in learning a certain trade either in schools, training centers, workshops/ conferences, while the opposite are unskilled men. Industrial Training Fund, (2005) highlighted craftsmen to include tile fixers, brick- layers (mason), carpenters, iron-benders, electrician, painters to mention but a few, while this study focuses on only limited craftsmen discussed as follows:

i. **Tile fixers** are responsible for laying hard tile and marble to floors, decks, walls and roof according to specifications in construction projects. Tile fixer must have training to set their tiles properly, fast and efficient to ensure less risk of project running behind schedule. However, Ene (2010) observed that tile fixers are susceptible to a number of injuries, Constraint training and bending over a surface can lead to repetitive stress and injuries; and to minimize such vulnerability arose the requirement for training needs.
ii. **Bricklayers** build foundations walls, partitions, and other structures made of brick, and they also work with concrete and blocks, bricks, tiles, marbles, and terra cotta.
iii. **Plasterers** have been one of the oldest craftsmanship in construction trade which are responsible for applying stucco and plaster to building components for insulation, support, aesthetic and smooth background on walls both internally and externally.
iv. **Carpenters** remain the oldest craftsmanship right from time memorial, they are engaged to construct, erect, install or repair structures, fitting or furniture made of wood; building frameworks including partitions, joists, struts and rafters, wood staircase, window and door frames and hardwood floors using their skills and tools (Usman, *et al*. 2012). To achieve efficient services, all these responsibilities demand the training and re-training for effective productivity on their respective areas of specialization in the built environment.

Craftsmen Training Needs Analysis in the Construction Industry

For the craftsmen to be focus, relevant, and productive, most often, synergy in training and re-training must come to play. Hassan *et al.,* (2012) observed that the key to the effective training and sustainable development is formulating detailed intellectual ideas that give directive for measurement and evaluation of the impact of training. In order to develop the framework and achieved the training needs based on ideas, a clear understanding of the synergy between training, education and continuing professional development (CPD) become necessary.

Training is described as an event often conducted by specific organizations to meet a particular need which is often occupationally differentiated, which can be effectively conducted on-the job or through self-directed models, manual or curriculum. This form part of educational endeavor but may be equally comprise an element of an industry level or in-house management training. *Education* is frequently viewed as occurring primarily in the school and system of higher learning. While, *CPD* explained how members of professional associations maintain, improve and broaden their knowledge, skills and develop the personnel qualities required in their professional lives (Hassan *et al.,* 2012). CPD involves the conscious updating and improving professional knowledge and competence throughout a person's working life, seeking to improve and optimize a person's career opportunities. Judging from these explanations' education, and CPD are related and need no separation for efficiency. Appreciating on what is to be learnt, how learning can best take place and how the learning outcomes can be measured are the critical questions which educators, learners, and CPD providers should provide answers.

When deciding the needs for training, there is also a technology to polarize education, and CPD, especially when identifying parties and their provision. Today the processes, technology

and professional scope changes, distorting boundaries separating job and professions. Therefore, the educational, training and CPD programs can no more be adequately covered along the traditional mode. The complexity, quantity and quality of knowledge, technology, skills and competency required, especially of those in the upper-level categories of the construction workforce is changing rapidly (Hassan, 2011). This is complicated by the speed at which information is transferred and exchanged. This has a very significant impact on how the craftsmen can cope and learn. They must now cope simultaneously with large database, integrated management and information system, as well as traditional manual system not in separate entity.

Reid and Barrington (2004) are of the opinion that, training alone is not powerful enough to develop craftsmen or solve the challenges of ineffective trained employee who are not ready to learn improve or promote sustainable culture and willingness of participation in the job. Training must be an integral part of the organizational development strategy, thereby placing adequate emphasis on the appreciation and development of its people for maximum benefit from the training.

Training and developing craftsmen are essential if the optimum performance of workforce is to be attained. According to Adams (2010) training is the fundamental catalysts and stimulators for those who are interested and willing and would contribute positively to the attainment of set goals for sustainable development. Training has a limited scope; and it is job-oriented, while developing the mean for building knowledge, understanding and becoming competent for future challenges (Hassan, *et al.*, 2012). Umar (2014) identified various factors required to provide continuity in training provision to include: financing, appropriate recruitment, training and re-training strategies, availability of local and digital learning courses, financial incentive to trainers; workers and alternative recruitment option, including attracting craftsmen currently employed in other industries. Therefore, creating enabling environment that stimulate required knowledge and competency become pertinent for sustainable training.

Materials/Methodology

This paper focused on the critical analysis of the training available to the Nigerian construction craftsmen. Reviewing on the construction industry, craftsmen and training framework, simplifies the inter-relationships between education, training and continuing professional development (CPD). The challenges that can arise when these concepts are not holistically appreciated are also highlighted. Creativities taken by the study is to develop efficient framework for training as a provision to improve and promote adequate training of craftsmen in Nigerian construction industry for sustainable development.

Development of Framework for the Effective Training of Craftsmen in the Construction Industry

Construction organization is confronted with complex challenges, thereby requiring special attention on basic conceptual structure based on the outline that adopt different needs and practices in difference circumstances while keeping focus on learning and adoption of current

innovation into the training process. For proper functionality, the right paradigm in developing framework has to be in place. Framework is described as a detailed intellectual formulation of ideas that give directive of the study. It demonstrates the synergy between the dependent and independent variables to be portrayed from the analysis (Ekanem, *et al.,* 2019). In this context, training remains the dependent variable while independent variables were identified training needs that lead to efficient framework of craftsmen in construction organisation shown in Figure 1. Figure 1 shows the framework for craftsmen training needs to be conceived as an evolving cyclic practice comprising: (i) Training needs and training needs analysis (TNA) (ii). design training needs (iii) motivation training needs (iv) health and safety training needs (v) information communication technology (ICT) training needs (vi) training implementation needs and (vii) training evaluation needs.

(a) Training Needs Analysis (TNA): Training needs analysis becomes the starting point of the training process that endeavor to analyze the performance "gaps" of individuals on their job to spot-out what must be learnt (Umar 2014 and Amusan, *et al.,* 2021). This is a systematic approach for distinguishing which type of training is needed and supply the required blue-print associated with training requirement. In order to attain this stage, these three processes must be all-inclusive as capture in Figure 1: (i) distinguishing the diverge and extent of training desires from organizations; (ii) exactly specifying the needs; and (iii) analyzing how efficient training is administered at the structure level, job-level and personal level accuracy. TNAs approaches have to be fastidiously articulated. Lin, *et al.,* (2018) explained various approaches such as "*supply-led approach"* sometimes trainer-driven is inaccurate as trainers may lack management expertise or data on real operational issues; *"demand–led approach*" remain commonly too, business oriented and frequently emphasizes on bottom-line which regularly results in neglect of employee's needs. The "*process-led approach*" tends to be too localised for divisions or departments for the training processes to be introduced in a good manner; and "*trainee-centered approach"*, that depends on self-assessment, has drawn robust criticism as they typically replicate worker desires rather than needs. Associate degree integrated approach combining these strategies to annul out any weakness would be ideal but however may be expensive but last long for sustainable development.

(b) Training Design Needs*:* This stage comes after training need analysis. This stage focused on developing new training strategies, academic courses and lessons for the existing staff. It conjointly permits teamwork to grow their inner skills instead of turning into static in their roles. Dantong, *et al.,* (2011) observed that designing to be trained as a craftsman gives meaning. Sure, but how does it help advance and sustain one's career? *"*Training design needs efficient become the best; it refines what you do until recently, thus opening door for opportunities". Self-audit and identifying one's top skill remain the primary, by putting these questions that need answers as captured in Figure 1.

i. What skills do I have? (List them out and rank them based on competency).
ii. What skills do I want to enhance? (Align this with your long-term goals).
iii. What new skills do I want to add to my CV? (Based on #1 and #2, decide).

Once you have the answers, quietly ask yourself. What skill do I want to master? What skill do I want to hone day in, day out? What is the one skill I want to offer this world? What is my craft? Identify your core craft and then list all the complementary skills that are essential for you to learn so you can master that core skill. It is the deliberate daily practice of your core skill, combined with your complimentary skills, compounded over time, that will help you achieve mastery. Through the process: **Core Skill + Complementary Skills + Deliberate Practice + Time = Mastery.**

Therefore, mastering the training procedures must be within the hands of personnel who are able to apply a wide range of competences in flexible ways to merge with the organization's operational issues (culture, motivation styles). The decision to determine the suitable training strategy ought to be supported by expertise compatibility with the objectives, estimated chance of transfer of learning to the work scenario, obtainable resources and beginner related factors (Hamid *et al.,* 2017). From this, mastering the core and complimentary skills, can be designed to be on-the-job, planned organizational expertise, in-house programs, planned expertise outside the organization, external courses and self-managed learning or combination of these approaches. In contrast to traditional training, the design of efficient and competence-based trainings must be based on unambiguous and measurable performance for sustainable development, because it needs to reflect the actual expectation and performance in the job role and further accelerate the advancement of ones' career for sustainable development.

(c) Training Motivation Needs: Motivation of craftsmen in the construction industry remain one of the major training strategy needs for improving productivity. Figure 1 highlighted those catalysts that stimulate learning to proceed at faster rate. Motivation is the process of raising the morale of workers in order to realize ones 'or organizational goal (Namala & Salihu 2016). While Lam and Tang (2003) explained motivation as a force inserted on person that drives a him/her physiologically and psychologically to pursue one or more goals to fulfill their sustainable expectation. This statement affirmed craftsmen motivation as crucial as it establishes a substantial foundation for higher performance level and productive time. Human motivation is a key for achieving excellence training, therefore a worker who is motivated will input maximum efforts for higher reproductivity and self-fulfillment. Therefore, this study is in support of Reid and Barrington (2004), and Usman *et al*., (2012) that training alone can't be enough, craftsmen need to be appreciated to bring out their best and fulfillment.

Namala and Salihu (2016), and Mohammed and Mohd (2019), findings revealed that demotivation accounted for poor training and workers rate in construction firms and identified severe factors that influence the training and productivity of craftsmen to include; effective supervision, patronage, promotion and salary increment, teamwork, love, rewarding, good relationship, effective communication, job security, performance feedback and bonuses. Motivation as one of the training needs will re-awaked the skilled-man-ship in the workforce for sustainable development.

(d) Health and Safety Training Needs: Almost all employers of workforce paid less attention to the wellbeing of their craftsmen on construction site, whereas training of craftsmen on health and safety measure should be the number one aim in this Covid-19 era for sustainment and overcoming any risk and eventuality for sustainable development among the craftsmen and other workforce in construction sector (Ogunnusi, *et al.*, 2020; Berry, *et al.,* 2020; and Ramti, *et al.*, 2021). Even though health and safety issues on training ground and construction sites are global problem this has given rise to poor project delivery, cost, and quality performance, with numerous claims and disputes. The occurrence of accidents could lead to a temporary stoppage of work, which could result in delays, increase in operating cost, and quality issues.

Training of construction craftsmen on various signs and symbols of health and safety precautions on site is very paramount to achieve the overall goal of the project because they are the major victims of accidents that affect project performance negatively (Adeagbo, *et al.,* 2019). Provision, availability and accessibility of safety equipment on site during training for easy identification and becoming acquainted on the usage and application accelerate their interest in learning. It's only when workers are in a sound state of mind and are physically fit that training become efficient and effective. Adegboyega, *et al.,* (2019) established that, lack of workers' adaptability to safety training is the most reason for accidents on sites, training of workers on health and safety is key to efficient safety practices. Eze*, et al.,* (2020), affirmed that among the workers on construction site bricklayers, carpenters, steel benders and tilers are the most vulnerable trades groups to hazards and accidents. Therefore, advocating for adequate training on health and safety measures, free flow of communication and penalties for defaulters will be led to reduction of accident among the craftsmen on construction site, thus improving their performance for sustainable development in Nigeria.

(e) Information Communication Technology Training Needs (ICT): The construction industry is currently experiencing a paradigm shift from traditional paper-based to digitalize based information exchange, which other industries like manufacturing and banking to mention but few have adopted and benefited long ago (Rivard, *et al.*, 2004, Adebayo 2007). The question is. Can ICT improve craftsmen training skills and help to get new skills? the answer is capital *YES.* ICT opened opportunities for adequate and efficient training of craftsmen for better functionality and productivity in the construction industry. Moshood, *et al.,* (2020), explained ICT from the construction industry point of view that, the adoption process is considered as an interaction between technology and task, and condition a person being able to shifts from first awareness of innovation to developing an attitude toward new innovation, a decision to accept or reject the new concept. The researchers further identified five stages for adopting ICT efficient training needs to include; awareness of facts, opinion, commitment, implementation and certification. Originally, at the awareness level, the craftsmen got the information and the understanding of emerging technologies, then, he/she starts making decision to accept or not to accept new innovations. At opinion stage, here the craftsmen are persuaded and encouraged to develop adaptive mind of acceptance, commitment level is a judgements stage where the craftsman considers possible advantages and setback, and takes the final decision on refusal or adoption, while the implementation stage, a subset of final

commitment where the technologies is adopted, implemented and certified by the trainers or educators in the organization. The use of ICT can impact on the traditional processes of organization in construction and result in change in organization process, working methods and culture (Adebayo, 2007). Craftsmen used ICTs to associate and network with other craftsmen within and outside their domains. ICT training exposes craftsmen to time management, and equally improve construction skills for effective decision making, coordination and identification of risk at workplace and security purposes to enhance construction productivity and sustainability.

(f) Training Implementation Needs: This is putting the training design into practice. The traditional training approach has now been significantly modified, replaced with the current approach that emphasize more of teaching and facilitating as shown in Figure 1. The training spectrum may differ from highly extremely directive to free-learning, guided-learning, discussion, presentation, instruction and learning for person or as gang. The training may differ from person to person but however, become simultaneous with varieties of tasks they partake. In most cases, formal training entails deliberate and structured presentation of experiences and should be associated with its purpose. The policy set up should be the key reference for implementation. Task force exercise, case discussion, simulation and games; role-play exercise, word, individual exercise, presentation/lectures and behavior modelling area unit are the common training ways and should be executed through external or internal suppliers. The trainer should be committed and equipped with wide-ranging toolkit of concepts, techniques, and approaches which may be adopted for functionality.

On-the-job coaching is widely recommended has been effective, versatile and comparatively very cheap, however can be ineffective if it's too detached from the particular job-environment or, if it doesn't follow program guidelines of standard outlines (Hassan *et al.,* 2012). It should be taken under consideration activity constraints like convenience and accessibility of the training premises, availability of the target teams, possible needs for several programs and the atmosphere at the work location. The program must be authentic to the preferred learning designs of the target gang. The delivery of coaching or learning must be clearly focused on what happens at the workplace and not simply what happens throughout the training events for sustainability. Therefore, to crown it all, training as a construction craftsmen give you a sense of fulfillments, meaning "the outcome of doing something you are good at, in a domain that interest you, exercising philosophy you believe in all whiles positively impacting someone's life because of the work you do"

(g) Training Evaluation Needs: This is the postmortem assessment of the total value of a training system from the training needs to implementation needs in terms of the technical, socio-economic as well as financial assessment. Therefore, in order to ascertain the cost value and benefit of the training, the dimensions must cover a systematic collection of relevant data needs to suit the selection, adoption, modification of training and developmental activities. Equally, since training is dynamic, there must be an on-going process from which continuous corrective action can be introduced to ensure an ever-improving efficient training for sustainable development. Therefore, all key parties concerned such as: senior managers, line

managers, training managers, trainers and learners must be involved in the evaluation. It is imperative that pre-training evaluation must be carried out before the actual training kickoff, in order to measure and ascertain the post-training impact/responses. Post-training evaluation is very important as the training itself become wasted if the trainees cannot sustain what they have learned (Bee & Beea, 1998).

Training effectiveness is the sub-set of evaluation and a value judgment, which is contingent upon the context of coaching; the baseline criteria set as the explicit and implicit training goals; and the accomplishment of these goals. The explicit and implicit goals of training should be laid down in the cost and benefits analysis, followed by the criteria for determining the degree of direct and indirect social cost or benefit are very subjective. The professional way to regulate training effectiveness is often to validate training holistically by taking into account outcomes from both the organization and the individual for sustainable development. Training purpose is the outcome of doing something you are good at, in a domain that interests you, exercising the philosophy you believe in all while positively impacting someone's life because of the work you do. Like a craftsman and give meaning to what you do for sustainable development.

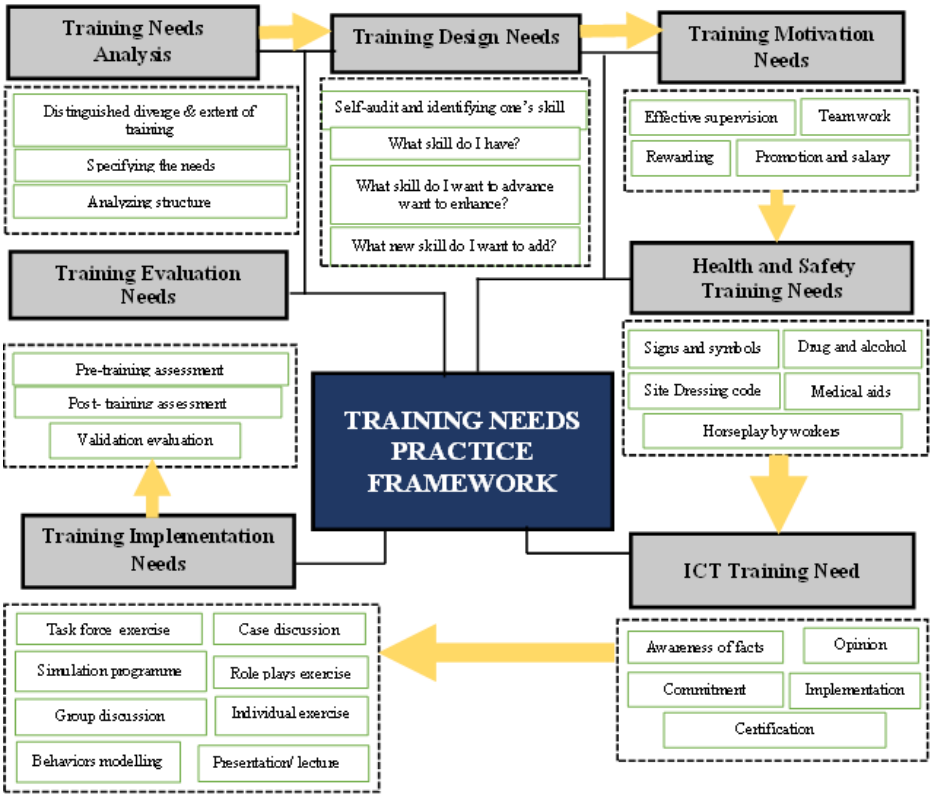

Fig 1: Framework for effective training of craftsmen in the construction industry (Adapted from Hassan, 2009)

Conclusion and Recommendations

In culminating the findings and discussions, this paper posits that a holistic approach to the provision of training to the construction craftsmen is key. Addressing the desires to efficiently train the construction craftsmen demand the appreciation of the continuous training within the context that the training is set and also the factors that impact the training process. The footing from which the training was built must be correct and, firm to sustain efficient performance for sustainability. Among the recommendations based on the findings of this study are: in order to improve and maintain high performance in productivity the trainers, managers in construction industry in Nigeria should adopt the developed framework for sustainable development. Investing in the seven components of the framework guaranteed alongside sincere gratitude of the contributions of the construction personnel to the trade, supply and to sustain an efficient career training for the craftsmen development.

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