Exploratory Factor Analysis of Green Innovative Skill Elements in Building Construction Programme for Economic Sustainability

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Abstract: ***Exploratory factor analysis (EFA) methodically simplify interrelated measures and explore the likely causal factor structure of a set of observed variables without striking a predetermined structure on the result. The purpose of this research is explore the elements of green innovative skills that are considered for integration in building construction courses at technical colleges for economic sustainability in Nigeria. In this study, Data was collected using quantitative approach using a sample of 308 respondents. The identified elements were analysed via descriptive statistics (mean and standard deviation) and Exploratory Factor analysis (EFA) which will greatly contribute to the body of knowledge. For the EFA, the recommended assumption were duly met and was conducted to test the factorial validity (construct) and to eliminate poor variables if found (observed variables) with a view to increasing the probability of Goodness-of-Fit for the results. In this analysis "Principal component analysis (PCA)" was the extraction method, "Varimax" was selected for factor rotation.In testing the construct validity; correlation matrix (>.3 and <.9) was calculated to confirm the inter-item correlation; "Kaiser-Meyer-Olkin KMO of (>.5) and anti-image correlations AIs diagonals' value of (>.5) were computed to test the sampling adequacy. "Barltts's test" (Significant at 0.000) was conducted to test whether the correlation between the variables are sufficiently large for factor analysis; and "communalities" were calculated to test the proportion of common variance within variables; and the percentage of the total variance explained (> 60%) were computed and shown. The findings for this study includeability to;plug into different networks across the globe and identify the nature of a problem your product or service will be solving. It is recommended that to achieve economic sustainability via the contribution of the building construction sector, there is need for proper utilization of these findings to enable BCT students acquire green innovation skills.***

Index Terms: ***Green skills, Innovative skills, Economic sustainability, Building construction trade.***

I. INTRODUCTION

Innovation skills are one of the essential skills needed for green jobs that identify opportunities and produce new approaches to respond to green challenges. Innovation skills are practically the categories of skills that enable individuals to become innovative in their actions. These are usually a combination of cognitive skills (think resourcefully and critically), behavioral skills (being able to solve problems, to manage risk), functional skills (basic skills such as writing, reading and mathematical ability) and technical skills (e.g. research techniques, project management, or IT engineering) (Wikipedia, 2016).

Innovation is very critical to the development of sectors like manufacturing, services, and education among others. Considering the education sector, Minghat and Yasin (2010) opined that additional teaching methods should also include problem-solving skills, creativity, and innovation skills and hence, the manufacture and industrial revolution that arose in the developed countries require skilled workers that made required innovation for achieving high living standards to be developed (King and Palmer, 2010). In view of the above, it is quite pertinent to note that innovation demands for skills significantly through direct government investment in infrastructure, which accelerate market demand mainly for renewable energy technologies (European Centre for the Development of Vocational Training CEDEFOP, 2012).

In Nigeria, at secondary school level, technical colleges are responsible for technology education under the active monitoring of National Board for Technical Education (NBTE). One of the core causes being offered at these technical colleges is the building construction trade (BCT). The BCT students are prepared to work in the building construction industries as technicians or craftsmen. Building construction industries are part and parcel for the economic development in Nigeria and other countries in world. To this end, it is pertinent to note that attaining economic sustenance via embedding green innovative skills in BCT curriculum could to a greater extent yield a positive response toward achieving economic sustainability.

II. LITERATURE REVIEW

Basically, aligning green innovative skills with building sector through educational setting of utmost importance. To this end, Organisation for Economic Co-Operation and Development OECD (2010) reported that priorities may involve support for institutional capacity building in terms of innovation skills through education and training, and public/private partnerships for technology and transfer of knowledge. Moreso, innovation skills is vital for the economic survival of every organization, this is because innovation "classifying, and evaluating, the innovation skills

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found in persons and needed by organizations is a powerful tool that helps workplaces and individuals to better match their innovation skills capacities with their innovation requirements" (The Conference Board of Canada, 2013). Similarly, O'Conor (2013) identified six innovation skills that could be used in industries including that of building construction for a successful innovation and these are:

1) **Implementation skills:** This skill entails coming up a good idea and knowing how to put this idea into practice and bringing it to market and also, knowing how to choose the right idea as well how to use that idea to capture value.
2) **Problem-solving skills:** This skill include the ability to identify the nature of the problem a product or service will tackle; creative problem-solving skills, which involve getting students to challenge and break their thinking patterns, so they can approach problems in different ways, and ask different questions.
3) **A curious mindset:** Innovators constantly need to be asking questions in order to come up with new ideas and ways of looking at problems and improving their products. Consequently, a curious mindset is at the heart of innovation. One way innovators can come up with incisive questions is by observing the world around them.
4) **Observational skills:** Innovators develop ways to solve problems by observing the world around them and noticing innovations in other industries that can be applied to a particular industry.
5) **Technology skills:** While it is possible to consider technology as innovation in itself, it should primarily be considered as a set of tools to facilitate further innovation.
6) **Collaborative skills:** Including the capability to set up global cross-functional teams to spot opportunities more easily by widening their net to more diverse inputs. Collaboration enables individual to be plugged into different networks across industries and across the globe. (O'Conor, 2013).

Critical look at the aforementioned innovation skills gives understanding that adopting innovations in industries like construction is challenging due to the fragmented and project-based nature of the industry, as construction innovation is a joint activity with a number of participants involved in the process, it is essential to consider the role of inter-organizational factors in applying fruitful innovations Ozorhon et al. (2013). These factors are likely to give more rise in embedding innovation skills in educational institutions especially TVET institutions with a view to preparing students to become innovative on successful graduation, which in turn, make them useful in societal, socio-economic and environmental sustainable development.

Accordingly, Dede (2010) pointed out that as much as students must to learn academic content' know how to retain what they have learnt and make effective and innovative use of what they know all through their lives. These learning and thinking skills are comprised of: critical-thinking and problem-solving skills, communication skills, creativity and innovation skills, collaboration skills, and media literacy skills. In line with the above, there is a need for individuals and workplaces identify, understand and assess the essential innovation skills measurements. In concise with this, The Conference Board of Canada (2013) suggested that the extent to which an individual demonstrates the desired innovation skill (and what it means to an organization and the individual). The importance of an innovation skill to a particular job or job function (and what it means to an organization or an individual); and the innovation skills gap that exists between individuals and their job functions (and what it means to an organization or an individual). In building construction industries, for example, ability to assessed innovation skills plays a vital role in the process of green building construction.

Supporting the above assertion Gunhan (2012b) noted that green buildings are expected to integrate renewable energy technologies into buildings, therefore, builders (construction firms) are expected to handle innovative technologies' integration during the construction project process. Furthermore, (Gunhan) further emphasized that In order to run a successful integration process, construction firms need to possess new skills; this is because construction firms which are involved with sustainable building projects will most likely deal with innovative green technologies' integration to buildings. In essence, innovation skills fall under the skills category, which can be required in almost every sector of human endeavours. Consequently, Oswald Beiler (2014) noted that as the field of civil engineering evolves to address twenty-first century challenges, the demand for creative and innovative thinking increases and as such engineering institutions should begin to integrate sustainability into the curriculum bearing in mind topics such as innovation and entrepreneurship as they are highly correlated with sustainability goals.

Integrating innovation skills into the curriculum will increase students' innovative knowledge and opportunities to work privately or in the construction industries. It was on the foregoing view Singh and Feuerriegel (2013) suggested that the "increased knowledge that educated individuals hold provides them with a greater resource from which to draw links to new data, thus creating new innovative opportunities" in the workplace (like construction industries). Though unlike other industries, construction involves the production of unique projects on site by a variety of teams that are brought together temporarily Ozorhon, et al. (2013).

In consequence of the above, adopting innovations in construction is challenging due to the fragmented and project-based nature of the industry; as construction innovation is a joint activity with a number of participants involved in the process, it is essential to consider the role of inter-organizational factors in implementing successful innovations. Similarly, Ozorhon (2012) noted that the primary source of the product, process, and organizational innovations have been agendas driven by environmental sustainability. In essence, the collaboration among team members and strong commitment proved to be the primary enablers of innovation; reluctance, inexperience, and cost were regarded as barriers to innovation.

III. OBJECTIVE

The purpose of the study is to identify the elements of green innovative skills that are suitable for integration into the curriculum of BCT at technical colleges for economic sustainability in Nigeria.

IV. METHODOLOGY

The main purpose of this study is to explore the important areas of green innovative skills elements considered appropriate for integration in BCT curriculum for technical colleges in North-western Nigeria. In this study, two categories of respondents viz: building construction professionals in the construction industries and teachers at technical colleges in Nigeria. The target population was 308 made up of 214 BCT teachers and 94 building construction professionals. In all, proportionate stratified random sampling was used to sample 209 respondents (136 teachers and 73 professionals) based on Kresjie and Morgan (1970) table for determining the sample size of a known population. Building on the above, in order to give every respondent equal chance to be selected the researcher uses simple random sampling to select from each category of the respondents.

A. Data Collection

Data collection is a very vital feature of any research in education. The basis for data collection I this research is its usefulness in allowing for the full range of possibilities for data gathering, and to systematize these procedures by their degree of predetermined nature, their focus for numeric versus non-numeric data analysis (Creswell, 2014). In this study, a quantitative instrument (structured questionnaire) was used in gathering information from the respondents. A quantitative data collection method bring breadth to a study by helping researchers collect data about different aspects of a phenomenon from many respondents. The 12-item structured questionnaire was developed from the literature reviewed based on the purpose of the research. Accordingly, the 12 items structured questionnaire was used in this for both categories of respondents. It comprises of two main sections "A" and "B". Section A implores information on demographic features of the respondents, while section B contained the 12 items structured questions on the areas of green innovative skills required for greening the BCT curriculum at technical colleges for economic sustainability in Nigeria.

B. Exploratory Factor Analysis (EFA) using SPSS

Basically, EFA according to DeCoster (1998) is carried out to determine the number of factors influencing variables and to analyze which variables are mutually correlated. For this study, the main reason of using EFA was to sort out which items of the questionnaire suitably defined individual variable scale, and to exempt which did not contribute to any variable scale. Precisely, EFA was applied to identify elements of green innovative skills by exploring and summarizing the underlying correlational structure for data collected using the 12-item questionnaire items (Williams et al., 2010). In this EFA, 308 raw data samples were used for the analysis and reduction method was conducted on the green innovative skills questionnaire items via SPSS 22.

For this research, in SPSS 22 for EFA, principal factor analysis with Kaiser-Meyer-Olkin KMO and Bartlett's test of sphericity; extraction correlation matrix with eigenvalues greater than 1 and maximum iterations for convergence at 25; varimax rotation, inter item correlation, anti-image AIs diagonal correlations, and total variance explained were considered in this analysis. The threshold value of KMO is >0.5 and Bartlett's test, when significant, is less than 0.05; if KMO is <0.5 it is not interpreted (Hair et al, 2006). Varimax rotation was suitable for the data that correlated to each other and value of factor loading (greater than 0.5) was accepted. According to Hair et al. (2006a) items which appeared in both or more factor's aspects with values greater than 0.5 and those appeared alone in a component were deleted.

C. Data Analysis and Findings

In determining outcomes of this research, suitable method and statistical tools were used in the data analysis. The data gathered from this research were screened using descriptive statistics (kurtosis and skewness) to test for the normality of the data which is value of 2 for kurtosis and 7 for skewness as recommended by (Kline, 2005). Similarly, the data was analyzed using EFA with the help of IBM-SPSS version 21 and IBM-SPSS. EFA was applied to identify appropriate areas of green innovative skills by exploring and summarizing the underlying correlational structure for data collected using the 12 questionnaire items (Williams et al., 2010).

V. RESULTS

In the following tables the results of EFA of green innovative skills, including estates of 12 items, INV1 to INV12 as no item was deleted in the test of normality and outliers and the overall Cronbach's Alpha coefficient of all the items is 8.15 greater than the threshold value of 0.6 recommended by (Hair *et al.*, 2006) (see Table 1).

The value of KMO was .831 which exceeded the factor analysis validity threshold value of 0.5 recommended by (Beavers et al., 2013; Hair et al., 2012a). This threshold value was supported by Bartlett's test of Sphericity which is significant at 0.000 which proven that the outcomes obtained were significant (Table 2.).

The inter-item correlation of all the 12 variables (Table 3) were greater than 0.3 with the exception of INV1 and INV2 which showed that there is a pattern relationship between items in the remaining data set (Yong and Pearce, 2013). Therefore, upon re-examining the contents of INV1 ("*engage others in making use of their skills, knowledge, and abilities*") and INV2 ("*provide constructive feedback and guidance in a constructive manner.")* were omitted in EFA.

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Table 1: Results of the Normality and Reliability Tests

Item	Cronbach's Alpha Value	N	Mean	Std. Dev	Skewness		Kurtosis	
		Statistic	Statistic	Statistic	Statistic	Std. Err	Statistic	Std. Err
INV1	8.15	308	5.0332	.64893	-.829	.128	2.801	.256
INV2		308	5.0332	.91530	-1.115	.128	1.919	.256
INV3		308	4.9584	.83062	-1.209	.128	2.607	.256
INV4		308	4.9889	.79225	-.991	.128	1.807	.256
INV5		308	5.0886	.69355	-.924	.128	2.431	.256
INV6		308	5.0803	.72009	-.884	.128	1.930	.256
INV7		308	5.0277	.71826	-.855	.128	1.875	.256
INV8		308	4.6316	.70809	-.858	.128	1.751	.256
INV9		308	5.3934	.74562	-1.268	.128	1.997	.256
INV10		308	5.0526	.70317	-.893	.128	2.190	.256
INV11		308	5.0609	.68852	-.901	.128	2.428	.256
INV12		308	5.0194	.72046	-.880	.128	1.920	.256
Valid		308						

Table 2: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		**.831**
Bartlett's Test of Sphericity	Approx. Chi-Square	1485.786
	df	66
	Sig.	**.000**

Table 3: Correlation Matrix

	Comp.	INV 1	INV 2	INV3	INV 4	INV 5	INV 6	INV 7	INV 8	INV9	INV 10	INV 11	INV 12
Correlation	INV1	1.000	.218	.234	.141	.201	.204	.356	.175	.111	.216	.175	.232
	INV2	.218	1.000	.170	.238	.188	.143	.227	.001	-.007	.166	.151	.184
	INV3	.234	.170	1.000	.291	.440	.284	.705	.318	.094	.356	.315	.247
	INV4	.141	.238	.291	1.000	.472	.430	.386	.310	.130	.430	.398	.302
	INV5	.201	.188	.440	.472	1.000	.553	.430	.287	.131	.452	.419	.436
	INV6	.204	.143	.284	.430	.553	1.000	.393	.161	.194	.447	.416	.399
	INV7	.356	.227	.705	.386	.430	.393	1.000	.156	.140	.591	.474	.396
	INV8	.175	.001	.318	.310	.287	.161	.156	1.000	.018	.154	.130	.114
	INV9	.111	-.007	.094	.130	.131	.194	.140	.018	1.000	.204	.278	.430
	INV10	.216	.166	.356	.430	.452	.447	.591	.154	.204	1.000	.584	.420
	INV11	.175	.151	.315	.398	.419	.416	.474	.130	.278	.584	1.000	.524
	INV12	.232	.184	.247	.302	.436	.399	.396	.114	.430	.420	.524	1.000

More so, the AIs anti-image correlation diagonals (measure of sampling adequacy MSA) value of all the items were greater than the threshold value of 0.5 which implied the adequacy of the data sample in EFA (Table 4). These outcomes established that all the EFA assumptions were confirmed (Comrey and Lee, 2013).

Table 5 indicated that there were two components with initial eigenvalues greater than 1. These components collectively accounted for **67.588**% of the variation in the actual variables which is greater than the minimum accepted variance explained of 60% recommended by (Hair *et al.*, 2012b). This suggested that only two extracted factors had associative relationships. Similarly, the cumulative value of extraction and Rotation Sums of Squared Loadings were also equaled to **67.588**%. Hence, the variation explained by the initial solution has not been lost because of the latent factors which implied the suitability of the extraction method.

Table 6 of communalities presents the variance proportion observed in every item in contrast to the other items and the matrixes of green innovative skills. All the extraction values obtained were greater than >0.4 and closer to 1 which signifies that the extraction communalities obtained through principal component analysis were satisfactory.

Table 4: Measure of Sampling Adequacy of Green Innovative Skills

		INV1	INV2	INV3	INV4	INV5	INV6	INV7	INV8	INV9	INV10	INV11	INV12
Anti-image Correlation	INV1	.913[a]	-.102	.043	-.049	-.072	-.134	-.047	-.072	.090	-.119	-.032	-.216
	INV2	-.102	.829[a]	-.040	-.155	-.024	.029	-.056	.109	.084	.021	.019	-.081
	INV3	.043	-.040	.694[a]	.074	-.234	.044	-.646	-.277	-.050	.135	-.013	.090
	INV4	-.049	-.155	.074	.889[a]	-.178	-.141	-.094	-.229	-.031	-.095	-.109	.052
	INV5	-.072	-.024	-.234	-.178	.872[a]	-.318	.084	-.092	.088	-.097	-.031	-.183
	INV6	-.134	.029	.044	-.141	-.318	.902[a]	-.065	.030	-.064	-.081	-.058	-.043
	INV7	-.047	-.056	-.646	-.094	.084	-.065	.758[a]	.164	.066	-.353	-.070	-.124
	INV8	-.072	.109	-.277	-.229	-.092	.030	.164	.691[a]	.034	-.021	.027	-.010
	INV9	.090	.084	-.050	-.031	.088	-.064	.066	.034	.697[a]	-.046	-.072	-.371
	INV10	-.119	.021	.135	-.095	-.097	-.081	-.353	-.021	-.046	.869[a]	-.304	.015
	INV11	-.032	.019	-.013	-.109	-.031	-.058	-.070	.027	-.072	-.304	.903[a]	-.250
	INV12	-.216	-.081	.090	.052	-.183	-.043	-.124	-.010	-.371	.015	-.250	.829[a]

Table 5: Total Variance Explained of Innovative Skills

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.128	51.600	51.600	4.128	51.600	51.600	3.570	44.625	44.625
2	1.279	15.988	67.588	1.279	15.988	**67.588**	1.937	22.963	**67.588**
3	.683	8.538	76.126						
4	.589	7.363	83.489						
5	.543	6.788	90.277						
6	.356	4.450	94.727						
7	.229	2.863	97.590						
8	.193	2.410	100.000						

Table 6: Communalities and Rotated Component Matrix of Innovative Skills

Communalities			Rotated Component Matrix					
			1st Analysis			2nd Analysis		
Item	Initial	Extraction		1	2		1	2
INV1	1.000	.420	INV3	.763		INV3	.790	
INV2	1.000	.693	INV7	.700		INV7	.719	
INV3	1.000	.585	INV5	.660		INV5	.675	
INV4	1.000	.455	INV8	.612		INV4	.621	
INV5	1.000	.567	INV4	.607		INV8	.615	
INV6	1.000	.473	INV12		.776	INV12		.791
INV7	1.000	.610	INV9		.732	INV9		.783
INV8	1.000	.656	INV11		.669	INV11		.641
INV9	1.000	.656	INV10	.527	.545			
INV10	1.000	.570	INV6	.483	.487			
INV11	1.000	.585						
INV12	1.000	.659						

Consequently, in the first analysis, the remaining 10 items of innovative skills were loaded into two factors (Table 6.0) excluding INV10 ("*know how and where to utilize the skills of team members, and get the best out of them.")* and INV6 ("*observe the world around and approach problems in different ways*") as each appeared in two factors. Upon re-examining their contents were not involved in CFA. In the second analysis, the remaining 8 items of green innovative skills were loaded into two factors (Table 6).

From Table 6, factor 1 consisted of five items which were INV8 ("*observe how customers use products to come up with ways to make their lives easier*."); INV4 ("identify the nature of a problem your product or service will be solving."), INV5 ("*put a good idea into practice and bring it to market*."), INV7 ("*notice innovations in other industries that can be applied to building industries*"); and INV3 ("*build and maintain relationships inside and outside organization with people*."). Factor 2 consisted of three items which were INV11 ("*understand what a business is about and have an effective business mission*."); INV9 ("*plug into different networks across industries and across the globe*."); and INV12 ("*design and implement a solid business plan with concrete financial targets*"). Therefore, the findings of this research are presented in the framework as shown in Figure 1 below.

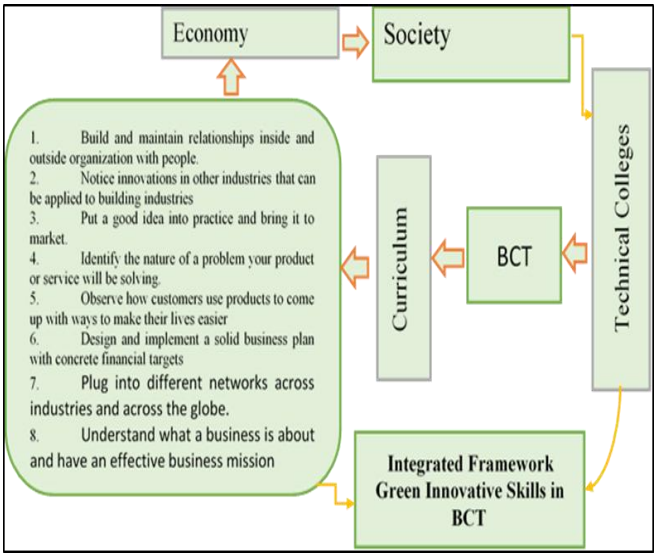

Fig. 1: Conceptual Framework of Innovative Green Skills for BCT

VI. DISCUSSION

In this segment of the research, respondents were in consensus for the inclusion of the ability to build and maintain relationships inside and outside organization with people into the BCT curriculum. This finding is in line with the recommendation made by Garavan *et al.* (2014) that the relationships and strength of stakeholder connections are critical for attaining sustained economic growth. Additionally, The modules proposed by Pavlova (2012) is aimed at increasing students' understanding of the idea of sustainability, of the relationships between sustainable development, a green economy and citizenship, ability to analyses and plan greening activities at the workplace, awareness of interrelationships between different issues of sustainable development. Also, UNESCO-UNEP (2016)reported that the norms and networks that allow combined action includes institutions, relationships, and customs that shape the quality and quantity of a society's social interactions. This indicated that such research evidences indicated that social capital is critical for societies to prosper economically and for development to be sustainable. This indicated that BCT students need to learn how to build and maintain relationships inside and outside organization as a prerequisite for the award of a job offer in most of the construction industries.

It was also revealed in the findings of this study that participants agreed upon to the embedding the ability to plug into different networks across the globe. This finding is in line with the recommendation made by Organisation for Economic Co-operation Development OECD (2015) that in order to stimulate green construction and consequent improvement of skills in the sector it will be necessary to develop an integrated strategy covering not only skills and employment issues, but also issues such as design, innovation, use of materials, and waste disposal. Also, the finding in concise with that of Dayue ((2016)) that the impact of sustainability changes has already reflected the students, advancing their skills for protecting the environment as this change brings about cognitive competence improvement among the students. Similarly, Azis *et al.* (2012) recommended that sustainable construction can be characterized by progressive improvements that help in increasing project efficiency; reduce construction waste and save energy. Additionally, O'Conor (2013) recommended that collaboration allows individual to be plugged into different networks across industries and across the globe. This will help in managing different personality types in order to get more diverse inputs from any team.

The findings in this study also include the ability to put a good idea into practice and bring it to market. This finding corresponds with UNESCO-UNEVOC (2014) report that the five regional forums of the UNEVOC network were held in Africa, in the Arab States, in Asia and in the Pacific, in Europe and North America, in Latin America and in the Caribbean. on "Advancement of TVET for Youth Employability and Sustainable Development" provided a platform for sharing examples based on evidence of Promising Practices in TVET greening and contributed to the advancement of programs and projects to integrate relevant green competences for a sustainable economy. Also, for Zolkifli *et al.* (2016) the implementation and green practices in industry exemplifies that knowing how to implement and practice generic green skills which include green innovative skills are more significant and crucial, and are required to perform the green practices, including recycling, reusing and reducing. More so, green innovation skills tends to also require open-mindedness and critical questioning well recognized thoughts or practices (Hoidn and Kärkkäinen, 2014), This indicated that integrating sustainability into the BCT curriculum through innovative activities that enable sustainable economy to prosper is really crucial.

The findings also involved the inclusion of the ability to identify the nature of a problem a product or service will solve. This finding is in line with the recommendation of Oluwale *et al.* (2013), that without the development of native technologies and implementation of introduced technologies, it is challenging to imagine how the problems of economic development can be resolved within a reasonable span of time. Moreover, according to Pavlova (2009) a number of problem-solving approaches can be utilized to expedite a specifically 'green design'. As argued by Turner (in press) ASIT (Advanced Systematic Inventive Thinking) is an effective tool for use in technology education classes as ASIT is a method of problem solving that offers the user with a series of efficient tools that help to analyze problems and solutions. More so, there are thus considerable overlaps between Education for Sustainable Development ESD and Green TVET. This is because Green TVET also include education for enhancing problem-solving skills in everyday situations), education for sustainable consumption and ensures that all workers are able to play suitable roles, both in the workplace and the broader community, by contributing to economic sustainability (UNESCO, 2012b). Green innovative skills is at the core of green skills and offers a framework to reorient building construction education and training at all levels towards economic sustainability.

The findings also include that there is a need for the infusion of observational skills which involve notice of innovation in other industries that can be applied to building industries. This finding corresponds with the recommendation of O'Conor (2013) that innovators come up with ways to solve problems by observing the world around them and noticing innovations in other industries that can be applied to a particular industry. It is also inconsistent with Aliagha *et al.* (2014) recommendation that the global rise in temperate is now undoubtedly real as increasing body of observations gives a collective picture of a warming world and other changes in the climate system. Furthermore, the finding also concise with the finding of Minghat and Yasin (2010) that students received guidance in both direct forms through interaction with other employees and indirect form through observation and discussion of activities in the workplace. BCT curriculum should be embedded with observational skills in order to prepare the students to be observant on whatever they are asked to do which will enhance their ability to secure a green job for a living.

It is also revealed from the findings of this study, respondents agreed with the inclusion of the ability to observe how customers use products to come up with ways to make their lives easier. This finding indicated that marketing in building construction sector involves ascertaining appropriate markets precisely; communicate efficiently with potential customers, users, or donors; and upholding a thoughtfully to the marketing place. The outcome is in adherence with the recommendation of Iwayemi (2008) that the Nigerian energy industry is probably one of the most unproductive in meeting the needs of its customers world over. With this finding, it is sufficient to note that incorporating green innovative skills is of greatest importance for the attainment of the economic sustainability.

The outcome also indicated that there is need to embed the ability to design and implement a solid business plan with concrete financial targets. This finding coincide with the findings of Bubou *et al.* (2010) that the globally coordinated large scale stimulus packages and policy measures that could bring about global economic retrieval in the shortest time possible., while putting the foundation for sustained economic growth in the medium- and long-term. It is worth to note that the economy is dedicated towards fixing the injury done to the world, one that flourishes by making a myriad of new trades' opportunities in the construction sector. More so, economic sustainability requires that a business or country utilizes its resources proficiently and correctly so that it can function in a sustainable manner to reliably make an operational earnings (Ecology, 2015). In the same line, OECD/Martinez-Fernandez *et al.* (2010)have argued that public support in this field will facilitate internal changes within existing firms to uphold and rise effectiveness and productivity; but it will also be imperative for the making of new "green" businesses to make economic sustainability.

The finding of this study also revealed that the respondents agreed that there is a need for integrating the ability to understand what a business is about and have an effective business mission. This finding is in consistent with the recommendation made by McCoy *et al.* (2012) that the Productivity Agenda first published in Australia in May 2008 articulated suggestions of more inclusive, innovative business management practices and stronger links between industry and education. Therefore, the links between the education and training system, industry and the community need to be strengthened via collaborative partnerships between industry, education and training systems need to be encouraged and fostered. Conscientious looking at these findings and the corresponding recommendations, it is sufficient to note that in integrating green skills into BCT curriculum these findings need to be considered.

VII. CONCLUSION

The findings of this study were used to develop a conceptual framework for integrating green innovative skills in the curriculum of BCT students for the attainment of economic sustainability in Nigeria. 8 important elements of 11 green innovative skills were identified using the 2 categories of respondents made up of BCT teachers and professionals. The framework was developed in adherence to the analyzed data (via EFA) showing the important elements based on their level of appropriateness on green innovative kills elements for effective integration into the curriculum of BCT in Nigeria. Conclusively, this conceptual framework has some implications for the supervisory agency (NBTE) toward ensuring that these identified elements are embedded into the curriculum and properly imparted to students. The conceptual framework will be used as a guide for effective integration of green innovative skills to help students offering BCT on graduation contribute immensely towards ensuring economic sustainability in Nigeria.

VIII. RECOMMENDATIONS

Based on the findings of this research, it is recommended that in order to achieve economic sustainability via the contribution of the building construction sector, there is need for proper utilization of these findings to enable BCT students to acquire green innovation skills. This will guarantee them to some extent secure jobs in the construction firms where they will display the green innovative skills acquired in the erection of sustainable buildings for economic sustainability.

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