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OPTIMISING THE AWARENESS OF BENEFITS OF SUSTAINABLE CONSTRUCTION PRACTICES IN NIGERIA

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Abstract. Awareness of the benefits of sustainable construction practices has been acknowledged as the fundamental principle that underlies its implementation. This survey study examined the level of awareness of the benefits of sustainable construction practices among building construction stakeholders and the strategies for optimising the awareness level through the use of questionnaire. The Mann–Whitney *U* Test result revealed that there was significant difference in the awareness level of benefits of sustainable construction practices between building professionals and non-professionals, in spite of a general moderate high level of awareness; due to difference in the training background and experience of the professionals and non-professionals. The Relative Importance Index (RII) result further showed that these differences could be narrowed through the adoption of 12 strategies for promotion of awareness. For maximum optimisation, the study suggested that six high level importance strategies had to be operationalised. However, when these are not readily available or very difficult to apply, alternative medium-high level importance strategy could be adopted. Thus, since non-professional stakeholders such as clients and non-professional contractors do not have opportunity of learning as professionals, the study suggested that the professionals should engage in such strategies as community or professional group engagement and local partnership with the non-professional stakeholders so as to create an interface that would promote awareness of benefits of sustainable construction practices among the stakeholders. Similarly, relevant authorities, such as government agencies and regulatory bodies need to embark on other alternative strategies such as advertisement promotion, etc.

Keywords: *Awareness, benefits, construction practices, optimisation strategy, sustainable construction.*

INTRODUCTION

The goal of sustainability is to meet people's basic needs and improve their quality of life while simultaneously ensuring that natural systems, resources, and diversity upon which they depend are maintained and enhanced, both today and for future generations (Ahn & Kim, 2014). Sustainable construction practices present a lot of benefits to the humanity and earth resources by integrating sustainable construction technique in construction project management (Atombo et al., 2015; Kibert, 2016). For instance, sustainable construction leads to energy savings of

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100–150 kWh/m^2 per year compared to the design without the energy features, payback time of less than 10 years and energy savings of more than 50 % compared to conventional building design (Roy et al., 2005). It decreases operating costs of building to 8–9 %, increases total building value by about 7.5 % and increase occupancy rates by 3.5 % (USGBC, 2006).

However, while developed nations have keyed into the benefits of implementing sustainable construction practices through invention and use of new technologies, developing countries are lagging behind and are grappling with fundamental social and economic issues (du Plessis, 2002). Many scholars have identified lack of awareness as a major barrier to implementing sustainable construction practices in the developing countries (see, e.g., Abigo et al., 2012; Abolore, 2012; Afolayan & Tunde, 2014; Chan et al., 2018; Darko & Chan, 2017; Davies & Davies, 2017; Djokoto et al., 2014; Ifije & Aigbavboa, 2020; Nduka & Ogunsanmi, 2015; Ojo et al., 2014). Specifically, Lam et al. (2019) identified lack of awareness of benefits of sustainable construction as a barrier to implementing sustainable construction practices. Others have also shown that lack of strategy to promoting sustainable construction is a contending issue towards implementing sustainable construction practices in Nigeria (Daniel et al., 2018; Esezobor, 2016).

In spite of the increasing awareness and popularity of sustainable construction among construction stakeholders (Ifije & Aigbavboa, 2020; Nduka & Sotunbo, 2014), there is abysmal low level of implementation for realisation of full benefits of sustainable construction practices to the environment, economy and society (Dania, 2016). The fact is that this problem is still subsisting calls for a reconsideration of the knowledge and awareness of the benefits of sustainable construction practices among construction stakeholders. Ibrahim & Raji (2018), Ifije & Aigbavboa (2020), and Komolafe & Oyewole (2018) recommended for the need for increasing awareness and sensitisation of the benefits of sustainable construction practices as part of corporate social responsibility of construction stakeholders.

In view of the aforementioned considerations, the aim of this study is to examine the level of awareness of benefits of sustainable construction practices among building construction stakeholders. The study also examines the strategies for awareness optimisation among the stakeholders based on building construction experts' perception. According to Pham & Kim (2019), awareness of the importance of sustainable construction practices needs to be integrated into the business strategies of sustainable development. In addition, adoption and implementation of sustainable construction practices could in turn yield a strong business benefits and increase inter-firm competition (Mashwama et al., 2020).

1. LITERATURE REVIEW

Abolore (2012) notes that despite an overall increase in consciousness and efforts to pursue sustainability through increasing public awareness, the general scenario appears to be increasing commitment by a small group of supporters instead of emergence of a renovated mass culture. Onwueme & Borsari (2007) attributed this situation to difficulty in understanding the philosophical

underpinnings of sustainability by the stakeholders. Sustainability creation and awareness, according to Abolore (2012), depend on the understanding of the consequences of individual actions, quest for knowledge and absolute involvement and commitment to the principle. Abidin (2010) also agrees that the pace of actions towards sustainable application depends on awareness, knowledge and understanding of the consequences of individual actions.

Unfortunately, the existing literature has paid little attention to optimising the awareness of benefits of sustainable construction practices among construction stakeholders in Nigeria. The extant literature has focused on ascertaining the level of awareness of stakeholders on the general concept of sustainable construction (Abolore, 2012; Afolayan & Tunde, 2014; Akinshipe et al., 2019; Dania et al., 2013; Nduka & Ogunsanmi, 2015; Nwokoro & Onukwube, 2011). Others have concentrated on identifying the benefits of sustainable construction (Davies & Davies, 2017; Isa et al., 2014; Olaleye et al., 2015; Sarkis, 2019). Only very few have attempted to look in the direction of awareness of the benefits of sustainable construction. For example, Ibrahim & Raji (2018) assessed the level of client's awareness on green building designs and the potential long-term benefits to be achieved by delivering green and sustainable buildings. Nduka & Sotunbo (2014) investigated the construction professional's perception on the awareness of green building rating systems and the accruable benefits in construction projects in Nigeria. Oluwunmi et al. (2019) investigated the perception of built environment students on the need to embrace the principles of green building in Covenant University, Ota, Ogun State, Nigeria.

Similarly, Komolafe and Oyewole (2018) examined the level of awareness, medium of awareness and the perception of office property users with regard to green building and their features in Lagos, Nigeria. The study revealed that a majority of the users were not aware of green building and that the predominant means of awareness was television. It further recommended for balance information spread, especially on the social and economic benefits of green building. To this end, Esezobor (2016) suggested that more thought and attention were needed to improve awareness and education of sustainable construction by focusing on the benefits of sustainable practices in Nigeria.

On the other hand, strategies for optimising the awareness of benefits of sustainable construction practices in Nigeria have not also been adequately explored. While related studies are prescriptive and lopsided (Oluwole, 2017), others focus on the drivers (Tunji-Olayeni et al., 2020) and strategies for sustainable construction (Oluwole, 2017; Tunji-Olayeni et al., 2018). Generally, studies have articulated the benefits and strategies for promoting awareness of sustainable construction practices as summarised in Table 1. These would form the basis for investigation in the current study.

Table 1. Benefits and Strategies for Optimising Awareness of Sustainable Construction Practices

Benefits	**Sources**
Lower long-term exposure to environmental or health problems	Isa et al., 2014; Lee et al., 2014
Reduces cost overall cost	Ahn & Kim, 2014; Lee et al., 2014
Increases economic value	Isa et al., 2014; Kibert, 2016; Meins et al., 2010; Nurick et al., 2015; Olaleye et al., 2015; Shen et al., 2010; Tunji-Olayeni et al., 2018;
Improves company's reputation	Giannoni et al., 2018; Isa et al., 2014
A business strategy	Giannoni et al., 2018; Tunji-Olayeni et al., 2018;
Reduces the use of energy and water resources	Danso, 2018; Hussin et al., 2013; Isa et al., 2014; Kibert, 2016; Omopariola et al., 2019
Minimises waste	Hussin et al., 2013; Lee et al., 2014
Minimises vulnerability to flooding	Hussin et al., 2013
Minimises pollution emissions	Ahn & Kim, 2014; Hussin et al., 2013; Lee et al., 2014
Increases profitable and competitive advantage	Giannoni et al., 2018; Isa et al., 2014; Omopariola et al., 2019; Shen et al., 2010
Enhances quality of life	Ahn & Kim, 2014; Omopariola et al., 2019
Provides desirable natural and social environments	Ahn & Kim, 2014; Omopariola et al., 2019
Improves client satisfaction, comfort, and well-being	Ahn & Kim, 2014; Lee et al., 2014; Omopariola et al., 2019; Yahuza & Erçin, 2020
Prevents environmental degradation	Danso, 2018; Lee et al., 2014; Tunji-Olayeni et al., 2018;
Enhances productivity	Ahn & Kim, 2014; Isa et al., 2014; Lee et al., 2014
Enhances psychological advantage	Isa et al., 2014;
Mitigates financial crisis	Ashour et al., 2015
Improves indoor environmental quality	Kibert, 2016
Reduces operational and maintenance cost	Omar et al., 2016
Reduces global warming and climate change	Ahn & Kim, 2014; Lee et al., 2014
Minimises cultural disruption	Ahn & Kim, 2014; Lee et al., 2014
Improves Return on Investments (ROI)	Ahn & Kim, 2014; Lee et al., 2014
Strategies for promoting awareness	**Sources**
In-house learning and family/friends	Ibrahim & Raji, 2018; Oluwole, 2017
Professional and academic journals, books and magazines	Alsaati, El-Nakla & El-Nakla, 2020; Ibrahim & Raji, 2018; Komolafe & Oyewole, 2018; Oluwole, 2017
Seminars, workshops and conferences	Alkhayyal et al., 2019; Oluwole, 2017; Sichali &Banda, 2017
Education and higher learning	Alsaati et al., 2020; Esezobor, 2016; Oluwole, 2017; Sichali & Banda, 2017

Traditional media outlet (newspaper, radio, television)	Alsaati et al., 2020; Cowper-Smith, 2015; Ibrahim & Raji, 2018; Komolafe & Oyewole, 2018; Oluwole, 2017; Sunthonkanokpong & Murphy, 2019
Social media, networking and websites	Alsaati et al., 2020; Cowper-Smith, 2015; Ibrahim & Raji, 2018; Magginas et al., 2019
Community or professional group engagement and local partnership	Cowper-Smith, 2015
Face-to-face contact	Cowper-Smith, 2015
Demonstration, sales offices and model houses	Ibrahim & Raji, 2018; Sichali & Banda, 2017
Video and entertainment channels	Alsaati et al., 2020; Cowper-Smith, 2015
Poster, leaflet, brochure, flyer and newsletters	Cowper-Smith, 2015; Ibrahim & Raji, 2018
Advertisement promotion	Ganganaboina & Raiz, 2017

Hypothesis

H_0: There is no significant difference between the awareness level of building professional and non-professional stakeholders on the benefits of sustainable construction practices.

2. METHODOLOGY

This study is survey research that made use of structured questionnaires administered to the building construction stakeholders (clients, contractors and professionals/consultants). The questionnaire was divided into three parts. Part 1 captures respondents' demographic information. Part 2 contains 22 variables upon which the awareness of the benefits of sustainable construction practices was measured. Part 3 contains 12 variables measuring strategies for optimising awareness of benefits of sustainable construction practices. Part 3 includes questions that were made for professionals only. The respondents were asked to express their perception according to a 5-point Likert scale, where 1 = very low/unimportant; 2 = low/unimportant; 3 = moderate; 4 = high/important; 5 = very high/important for the level of awareness and importance of strategies respectively.

The population of this study includes all building developers/owners, contractors and professionals in Southeast Nigeria. In this case, the actual population is not entirely known. Bujang et al. (2017) suggested that the minimum required sample size for almost all types of multivariate analysis should be determined conventionally, using a rule of thumb. Siddiqui (2013) argued that the appropriate sample size depended upon the numbers of items available for factor analysis. Whereas Taherdoost (2016) states that what is important is the absolute size of the sample selected relative to the complexity of the population, the aim of the researcher and the kinds of statistical manipulation that will be used in data analysis. Thus, Tabachnick & Fidell (2013) proposed the use of "$50 + 8m$" formula where "m" is the number of factors. Siddiqui (2013) suggested a sample size of 200 for 10 items; 250 for 25 items; 400 for 90 items; and 1000 for 500 items. Since there

were 34 combined variables in this study, the sample size for this study was approximately 330.

Then a total of 330 copies of questionnaire were randomly distributed to the respondents through self-administration and online post via established mail contacts. The objectives of the study were clearly stated in the consent letter attached to the questionnaire. 158 responses representing about 47.88 % were retrieved and analysed using statistical package for social science (SPSS).

The data generated from the survey were subjected to descriptive and quantitative analyses. Mean Score Index (MSI) and Relative Importance Index (RII) were computed to determine and rank the level of awareness of the benefits of sustainable construction practices and strategies for optimising awareness of benefits of sustainable construction practices respectively. Mann–Whitney *U* Test statistic was employed to determine the significant difference in the level of awareness of benefits of sustainable construction practices among the construction stakeholders based on the professionals/non-professionals' grouping. The level of importance of the strategies was determined based on the five importance levels transformed from RII values according to Akadiri (2011), where high (H) = ($0.8 \leq RII \leq 1$), high-medium (H-M) = ($0.6 \leq RII \leq 0.8$), medium (M) = ($0.4 \leq RII \leq 0.6$), medium-low (M-L) = ($0.2 \leq RII \leq 0.4$) and low (L) = ($0 \leq RII \leq 0.2$).

Decision: Reject H_0 if $p < 0.05$ otherwise, do not reject H_0 and conclude.

Furthermore, the result of this study is acceptable within the Margin of Error (ME) of ±5.395 % and 95 % Confidence Interval (C.I). According to DataStar (2008), an acceptable margin of error used in the survey research falls within 4 % and 8 % at the 95 % confidence level.

3. RESULT AND DISCUSSION

Table 2. Respondents' Background Information

Variable	Number of Responses	% of Responses
Category of respondent		
Professional	67	42.41
Non-professional	91	57.59
Professional affiliation		
Building	14	8.86
Architecture	20	12.66
Engineering	23	14.56
Quantity Surveying	8	5.06
Estate Management	2	1.27
None/others	91	57.59
Highest Educational Level		
None	0	0.00
Primary	16	10.13
Secondary	35	22.15
Tertiary	107	67.72

Table 2 shows the background information of the respondents. It reveals that 42.41 % of the respondents are professionals in the building industry, while more than half (57.59 %) are non-professionals in the building industry who make up the bulk of building developers/clients and contractors. Expectedly, these professionals belong to different professional groups as shown in Table 1. Meanwhile, all the respondents were educated at least up to primary school level, but majority (67.72 %) had tertiary education. This implies that the respondents were able to understand and respond to questions in the questionnaires.

Table 3. Level of Awareness of Benefits of Sustainable Construction Practices

Benefits	**Professional (67)**		**Non-professional (91)**		**AV. MSI**	**Overall ranking**
	MSI	Rank	MSI	Rank		
Lower long-term exposure to environmental or health problems	4.30	11	3.71	4	3.96	6
Reduces cost overall cost	3.88	18	2.79	14	3.25	16
Increases economic value	4.06	15	3.25	9	3.59	13
Improves company's reputation	4.13	12	3.25	9	3.63	10
A business strategy	3.67	20	3.55	6	3.60	12
Reduces the use of energy and water resources	4.12	13	2.53	17	3.20	18
Minimises material waste	4.76	3	4.11	1	4.39	2
Minimises vulnerability to flooding	4.09	14	2.59	16	3.23	17
Minimises pollution emissions	3.99	16	2.73	15	3.26	14
Increases profitable and competitive advantage	4.94	1	4.03	2	4.42	1
Enhances quality of life	4.42	9	3.16	11	3.70	8
Provides desirable natural and social environments	4.45	8	3.12	12	3.68	9
Improves client satisfaction, comfort, and well-being	4.36	10	3.46	7	3.84	7
Prevents environmental degradation	4.57	6	2.96	13	3.63	10
Enhances productivity	3.03	22	2.37	19	2.65	22
Enhances psychological advantage	3.85	19	1.91	22	2.73	21
Mitigates financial waste	3.94	17	2.16	21	2.92	19
Improves indoor environmental quality	4.51	7	3.58	5	3.97	5
Reduces operational and maintenance cost	4.91	2	3.45	8	4.07	4
Reduces global warming and climate change	4.70	4	4.02	3	4.31	3
Minimises cultural disruption	3.43	21	2.41	18	2.84	20
Improves Return on Investments (ROI)	4.61	5	2.26	20	3.26	14
Group mean average	4.21		3.06		3.55	

Table 3 shows the result of the awareness level of benefits of sustainable construction practices of construction stakeholders based on MSI values. The result reveals that the average level of awareness among the professional stakeholders (MSI = 4.21) is higher than that of the non-professional stakeholders (MSI = 3.06). However, the overall average level of awareness is moderately high (MSI = 3.55). Out of the 22 variables considered as benefits, five most popular benefits among professional stakeholders are: Increases profitable and competitive advantage (MSI = 4.94), Reduces operational and maintenance cost (MSI = 4.91), Minimises material waste (MSI = 4.76), Reduces global warming and climate change (MSI = 4.70) and Improves Return on Investments (ROI) (MSI = 4.61). Whereas, five most popular benefits among non-professional stakeholders are: Minimises material waste (MSI = 4.11), Increases profitable and competitive advantage (MSI = 4.03), Reduces global warming and climate change (MSI = 4.02), Lower long-term exposure to environmental or health problems (MSI = 3.71) and Improves indoor environmental quality (MSI = 3.58).

Overall, the five most popular benefits among construction stakeholders are: Increases profitable and competitive advantage (MSI = 4.42), Minimises material waste (MSI = 4.39), Reduces global warming and climate change (MSI = 4.31), Reduces operational and maintenance cost (MSI = 4.07) and Improves indoor environmental quality (MSI = 3.97). The result shows that the stakeholders are mostly aware of the environmental and economic benefits of sustainable construction practices. Significantly, the result suggests that the stakeholders have not seen sustainable construction practices as a major agent of cost reduction in construction project or a means of social and cultural sustainability rather more of environmental benefits.

Table 4. Result of Mann–Whitney *U* Test for Significance of Differences

Test Statistics[a]	
	Awareness of Benefits
Mann–Whitney *U*	37.500
Wilcoxon **W**	$4.224 \cdot 10^3$
Z	–10.599
Asymp. Sig. (2-tailed)	0.000
Exact Sig. (2-tailed)	0.000
Exact Sig. (1-tailed)	0.000
Point Probability	0.000
[a] Grouping Variable: Respondent Groups.	

Table 4 shows the Mann–Whitney *U* Test result for test of significance difference in the awareness level of two groups of construction stakeholders (professional and non-professional). The result reveals that there is significant difference in the level of awareness of benefits of sustainable construction practices between professional and non-professional building construction stakeholders. In this case, $U = 37.500$, $Z = -10.599$, and $p < 0.001 < 0.05$. The result suggested that

the significance difference could be as a result of the differences in the background of the stakeholders. The professionals would have learnt about the benefits of sustainable construction practices through their education in higher learning, professional and training, conferences, seminars and workshops of various professional organisations, professional groupings and associations, experience through practice, etc. The non-professionals have little means of learning sumptuously about the benefits of sustainable construction practices like their professional counterparts.

Table 5. Result of Mean Rank from Mann–Whitney *U* Test

Ranks				
	Respondent Groups	***N***	**Mean Rank**	**Sum of Ranks**
Awareness of Benefits	Professionals	67	124.44	8337.50
	Non-professionals	91	46.41	4223.50
	Total	158		

Since there is significant difference between the two groups, a comparison of the mean of distribution of the two groups is desirable. Therefore, Table 5 shows that the professional group ($N = 67$) has a larger mean rank (124.44) than the non-professional group ($N = 91$) with mean rank (46.41) and tends to take larger values. The presence of larger values for the professional group suggests the existence of statistical significance difference between the two groups. However, to determine the magnitude of the difference between the two groups, an effect size is calculated.

The effect size (r) can be calculated by dividing the absolute (positive) standardised test statistic Z by the square roof of the number of groups (N) as represented in Eq. (1).

Thus,

$$r = \frac{Z}{\sqrt{N}}, \tag{1}$$

where $Z = 10.599$ and $N = 158$, and resulting $r = 0.843$.

Based on Cohen's classification of effect sizes where 0.1 = small effect, 0.3 = moderate effect and ≥0.5 = large effect, the effect size in this study is 0.843, which indicates large effects. This suggests that the differences in the level of awareness of benefits of sustainable construction practices between building construction professionals and non-professionals have a large effect as a result of the above-mentioned reasons.

Table 6 shows the importance of the strategies for optimising awareness of benefits of sustainable construction practices among building construction stakeholders based on the professionals' assessment. From the RII values, the result indicates that six strategies with RII ranging from 0.81 for Poster, leaflet, brochure, flyer and newsletters to 0.94 for Education and higher learning are of high importance, five strategies are of medium-high importance, whereas only one

strategy (In-house learning and family/friends) is of medium importance. However, the three most important strategies for optimisation of awareness of the benefits of sustainable construction practices among building construction stakeholders are: Education and higher learning (0.94), Seminars, workshops and conferences (0.91) and Social media, networking and websites (0.87). This could be likened to the result of Table 3, which showed a large difference in the level of awareness of the benefits of sustainable construction practices between building construction professional and non-professionals. This is because these strategies are mainly the processes of training and development of building construction professionals, which may not likely be available for most non-professionals. Besides, awareness has to come through learning and communication routes of which the professionals have greater advantage over the non-professionals when it concerns construction processes and innovations.

The overall result suggests that all the strategies have potentials for increasing the awareness of benefits of sustainable construction practices among building construction stakeholders. However, those strategies with high importance level need to be operationalised for maximum result. The implication is that where such a strategy with a high importance level could not be applied or had to be applied with much difficulty, an alternative strategy with a medium-high importance level could be applied.

Table 6. Importance of Strategies for Optimising Awareness of Benefits of Sustainable Construction Practices

Strategies	N	RII	Overall ranking	Importance Level
Education and higher learning	67	0.96	1	H
Professional and academic journals, books and magazines	67	0.84	5	H
Seminars, workshops and conferences	67	0.91	2	H
Social media, networking and websites	67	0.87	3	H
Traditional media outlet (newspaper, radio, television)	67	0.75	8	H-M
Poster, leaflet, brochure, flyer and newsletters	67	0.81	6	H
Community or professional group engagement and local partnership	67	0.85	4	H
Face-to-face contact/advocacy visit	67	0.66	10	H-M
Demonstration, sales offices and model houses	67	0.74	9	H-M
Video and entertainment channels	67	0.61	11	H-M
In-house learning and family/friends	67	0.58	12	M
Advertisement promotion	67	0.77	7	H-M

Fundamentally, the objectives of this study were to determine the awareness level of the benefits of sustainable construction practices between building construction professionals and non-professionals and to examine the strategies for optimising the awareness among building construction stakeholders. This study, therefore, revealed that there was greater awareness among the professional groups than the non-professional groups in the building construction industry; in spite of

the fact that the overall awareness level among the stakeholders was moderately high (3.55). Specifically, the result showed that the professionals had a high awareness level while non-professionals had a medium awareness level. It further established the existence of significance differences between the two groups through the result of the Mann–Whitney *U* Test ($U = 37.500$, $Z = -10.599$, and $p < 0.001 < 0.05$).

According to this study, the differences could be as a result of difference in the backgrounds of the professionals and non-professionals. That is to say that professionals have many opportunities of learning more about sustainable construction and its benefits through their training at higher institutions, conferences, workshops and seminars organised by different professional associations, social media, etc.; whereas non-professional have limited means principally because they are outside the professional circles in the building industry and only very few have interest and access to such events as conferences, workshops and seminars organised by different professional associations. Furthermore, while the bulk of learning is done through education at higher education institutions and professional mandatory training and development, non-professionals ordinarily would not have had such training opportunities. The study also suggested through the effect size computation that these factors could cause the differences to have a large effect ($r = 0.843$). This result supports that of Komolafe and Oyewole (2018) and Ibrahim and Raji (2018) who found a low level of awareness of the benefits of sustainable construction among building users and clients (non-professionals), respectively. It also aligned with such studies as Ifije and Aigbavboa (2020), Nduka and Sotunbo (2014) that recognised the increasing awareness level among construction stakeholders.

On the other hand, the study identified 12 strategies through which awareness of the benefits of sustainable construction practices could be enhanced among building stakeholders. It found six high level importance strategies (education and higher learning, seminars, workshops and conferences, social media, networking and websites, community or professional group engagement and local partnership, professional and academic journals, books and magazines and poster, leaflet, brochure, flyer and newsletters) which would be operationalised for maximum result. It then argued that these strategies were mainly the processes of training and development of building construction professionals which might likely be the reason for differences in the awareness level between the professionals and non-professionals. This is in line with the finding of Alsaati et al. (2020), Komolafe & Oyewole (2018), Magginas et al. (2019), Alkhayyal et al. (2019), Sichali & Banda (2017).

However, it further argued that all the strategies would have potential for increasing awareness of the benefits of sustainable construction practices among building construction stakeholders, but those strategies with a high importance level would need to be considered first and operationalised for maximum result. The study also suggested that in the event of unavailability or difficulty in application of those strategies with a high importance level, alternative strategies with a medium-high importance level could be adopted. This also supported the positions

of Cowper-Smith (2015), Ganganaboina and Raiz (2017), Ibrahim and Raji (2018), Oluwole (2017), Sunthonkanokpong and Murphy (2019).

CONCLUSION

As construction activities continue to yield undesirable results to the society, environment and economy, efforts are being made to improve construction processes through sustainable construction practices. However, implementation of sustainable construction practices has been slow and challenging due to a low level of awareness of its benefits among some key construction stakeholders. Awareness of the benefits of sustainable construction practices has, therefore, been acknowledged as the bedrock of implementation of sustainable construction practices. The present study examined the awareness level of benefits of sustainable construction practices among building construction stakeholders and the strategies for optimising the awareness level of the stakeholders. It found that in spite of the general moderate high level of awareness there was a significant difference in the awareness level of benefits of sustainable construction practices between building professionals and non-professionals as a result of differences in the training background and experience of the professionals and non-professionals.

However, the study indicated that the differences could be narrowed. On this basis, it presented 12 strategies which could be adopted for optimisation of awareness level of benefits of sustainable construction practices. However, for maximum optimisation, the study suggested the application of six high level importance strategies (education and higher learning, seminars, workshops and conferences, social media, networking and websites, community or professional group engagement and local partnership, professional and academic journals, books and magazines and poster, leaflet, brochure, flyer and newsletters). It also suggested that when these were not readily available or difficult to apply, an alternative medium-high level important strategy could be applied.

The study implies that since non-professional stakeholders such as clients and some contractors do not have the opportunity of learning about the benefits of sustainable construction practices through education at higher education institutions and professional trainings as the professionals, other alternative means need to be activated so as to increase the awareness level of the non-professionals for possible wide implementation of sustainable construction practices. It suggests that the professionals have to adopt such strategies as community or professional group engagement and local partnership to create an interface that will promote the awareness of benefits of sustainable construction practices among the stakeholders. On the other hand, relevant authorities, such as government agencies and regulatory bodies need to embark on such strategies as distribution of poster, leaflet, brochure, flyer and newsletters, advertisement promotion, traditional media outlet (newspaper, radio, television), video and entertainment channels, etc.

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