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RESEARCH ARTICLE

SOCIOECONOMIC FACTORS INFLUENCING AESTHETIC PERCEPTION OF UNIVERSITY SENATE BUILDING FAÇADES IN SOUTHWEST NIGERIA

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Abstract

Users' involvement is an essential ingredient for architectural and engineering projects to boost users' satisfaction and ultimately, project success. Nevertheless, there are socioeconomic factors, which predict the users' level of involvement in such projects. This paper identified the socioeconomic factors determining the key aesthetic elements preference for university administrative building façade aesthetic judgment in southwest Nigeria. The key aesthetic elements considered in this study are façade shape, colour and height. Quantitative data were collected from 577 respondents through a structured questionnaire and subjected to Categorical Regression Analysis. The result showed that age group, highest academic qualification, and income level were significant predictors in determining the façade aesthetic judgment. This study's findings imply the need for planners and designers to ensure users participation in line with significant factors for aesthetic appreciation of university administrative building façade and other campus buildings. This outcome aids the availability of quality, timely and reliable empirical data specific to a geographical location significantly.

Introduction:-

The need to evaluate the built environment by involving immediate users is becoming increasingly important in building provision in developing countries (Fakere &Ayoola, 2018). The users' experience and judgments determine the physical world's aesthetic perception (Polat, 2015). However, the socioeconomic character of the users determines their experience and judgment. In Nigeria, due to the top-down approach of public project initialisation and execution, the users' participation is often exempted (Fakere, &Ayoola, 2018). An exemption of users in the decision making process on projects implies a dearth in empirical information of users influence on building outcome and the characteristics of the users. Theuniversity environment is inclusive in the exclusion of users in the development of its physical structures.

Universities are important institutions in effecting social change and development (Brennan, King &Lebeau, 2004). Aesthetics in a university environment is a crucial factor for a balanced learning environment. Papandrea (2015) suggested that an excellent correlation between campus aesthetics and academic reputation is a useful tool for

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attracting the public for enrolment. High-quality buildings and facilities on a university campus, as encapsulated in the provision of high-quality supportive research and educational environment for both staff and student are one of the requirements of a world-class university (Alden, & Lin, 2004). However, considering the diverse types of buildings on the university campus, different buildings' categories exist based on function. The university administrative building (senate building) stands out as the university's core,regulating the entire campus.

According to Obaleye, Adeboye, Ezema and Opaluwa (2020) in an aesthetic study, the key façade elements in a university senate building are facade shape, colour and height. These elements were the most preferred out of nineteen other façade elements. Aesthetic study addresses and has a significant influence on the users (Minai,1995). Therefore, users' opinion is of great importance to the designer in the decision making process for an acceptable built environment (Moghaddam& Ibrahim, 2016; Brennan et al., 2004).

Aesthetic judgement is based on human perception. According to Qiong (2017), perception in philosophy and psychology is the process of achieving awareness or comprehension of sensory information. Qiong (2017) identified the stages of the perception process in three distinctive stages: selection, organisation and interpretation. Selection involves the conversion of the environmental stimuli gathered by the sensory organs into a meaningful experience.

In contrast, the organisation involves categorising selected information from the environment into meaningful patterns such as shape and height. Interpretation as the third stage of perception deals with the attribution of meaning to the selected stimuli, which differs from one person to another based on their culture. According to Samovar, Porter, McDaniel, & Roy (2017), culture makes available a perceptual lens that significantly influences how we interpret and evaluate what we receive from our environment. Their culture and socioeconomic characteristics determine aesthetic perception as it relates to human.

While users' participation is vital in the built environment decision making, several factors contribute to its success. The factors considered common in the study of users participation in developments according to Fakere, and Ayoola (2018) are the socioeconomic factors. These are factors that deal with the interaction of human behaviour, their income and finances. The use of socioeconomic factors in aesthetic studies is prevalent and the built environment in general.

For instance, Gjerde (2008) in a study on aesthetic perception and judgement of urban streetscapes considered gender, age groups, occupations and education levels, while Safarova, Pirko, Jurík, Pavlica and Nemeth (2019) studied the relationship between young architects' and non-architects' aesthetic evaluation of buildings in the Czech Republic by considering age, gender, and education. Ghomeshi and Jusan (2013) considered gender, marriage status, education, and age in investigating different aesthetic preferences in residential facade design; Askari and Soltani (2018) assessedbuilding façades' contributionto streetscapes attractiveness in Kuala Lumpur by usingthe familiarity with the location, gender and age.

Other socioeconomic characteristics considered are status in school (staff and students) in studying elementary school fences perception in urban areas by Huang (2012). Liu and Chuang (2014) considered academic major, gender, and grade to study aesthetic factors and aesthetic responses to the interior environment. Chen, Sun, Liao, Chen, and Luo (2015) observed personal qualification, age groups and gender in landscape perception for determining the scenic beauty of in-stand natural secondary forests. Rezafar and Turk (2018) highlighted sex, age, position and monthly income in a study on urban design factors involved in the aesthetic assessment of newly built environments in Istanbul.

Mutlu and Kiran (2020), in Antalya, Turkey studied the visual assessment of building facades, which determines the avenue boundaries based on the colour factor. The online survey was done along the gender line primarily. Santosa and Fauziah (2017) evaluated restaurant façade restricted respondents to 18 years and above for easy comprehension and objective assessment. Similarly, Jennath and Nidhish (2016) in a study on library buildings aesthetic judgement considered the age group of 18 to 23years as an important requirement for respondents.

Kalaycı and Bilir (2016) in a study on police station façade considered eight demographic factors. They are; gender, age, educational level, occupation, occupational experience, possession of police relative or friend, familiarity with police office buildings and a visit to the police office.

Most of these studies focused on socioeconomic characteristics in their study of aesthetic appreciation in several spheres. However, in this study, the socioeconomic factors considered were age, gender marital status, academic

qualification, average monthly income, length of stay of respondent and status in the universities. These could be predictors of aesthetic perception. Consequently, this paper aims to identify the socioeconomic factors with vital relevance in determining the shape, colour and height preference for the façade of the university administrative building façade aesthetic judgment in southwest Nigeria for future application and architectural education.

Methodology:-

The study population for this study cuts across the three categories of the university according to ownership. The study population includes all the 54 Universities found in Southwest Nigeria as of December 2019, which comprises 7 Federal universities, 11 State universities and 36 Private owned universities (National University Commission (NUC), 2019). The sample frame for this study comprised 34 universities that met the criteria of being established between 1948 and 2015 (2015 being the commencement of the study); having a senate building above one- floor height, solely dedicated to administrative purposes and having the senate chamber within it. The 34 universities in the sample frame consist of 7 federal, ten state and 17 private-owned universities. Consequently, ten universities' sample size in southwest Nigeria was adopted using the proportionate sampling technique (Casakin&Mastandrea, 2009). The sample size consists of 2 federal, three state and five private owned universities. The questionnaire was distributed to ten universities in southwest Nigeria using stratified random sampling. The sample size for users was calculated using the Yemane formula for calculating a finite population. A sample size of 577 was analysed, and data analysis was done using SPSS Version 20 by categorical regression.

Results:-

Figure 1 presents the ten selected university administrative building facades from Universities in Southwestern, Nigeria.

			
Image 1:Augustine University	Image 2: LadokeAkintola University	Image 3: Fountain University	Image 4: Adeleke University
			
Image 5: Elizade University	Image 6: Tai Solarin University of Education	Image 7: University of Ibadan	Image 8: AdekunleAjasin University
			
Image 9: Covenant University	Image 10: University of Lagos		

Fig. 1:-Ten selected administrative building facades.

Socioeconomic characteristics of Respondents

This section contains background information of the 577 respondents' in the selected universities in the study area. The socioeconomic characteristic includes gender, age group, marital status, status in the university, highest academic qualification, income level per month, and length of stay in the university are presented in Table 1

Table 1:- Socioeconomic Characteristics of Respondents.

Attributes	Frequency (n=577)	Percentage (%)
Age Group		
20 years and below	87	15.1
21-30 years	255	44.2
31-40 years	67	11.6
41-50 years	88	15.3
51 years above	80	13.9
Gender		
Male	337	58.4
Female	240	41.6
Marital Status		
Single	304	52.7
Married	257	44.5
Divorced	16	2.8
Status in University		
Staff	205	35.5
Student	372	64.5
Academic Qualification		
SSCE	201	34.8
OND	57	9.9
Bachelor Degree	244	42.3
Masters	60	10.4
PhD.	15	2.6
Length of Stay		
Less than 4 years	163	28.2
Between 4-8 years	104	18.0
Between 8-12 years	108	18.7
Between 12-16 years	79	13.7
Between 16-20 years	61	10.6
Above 20 years	62	10.7

Age Group of the Respondents:
Age consideration is significant in determining the level of participation of diverse age groups in the questionnaire survey. As presented in Table 1, most respondents constituting 44.2% and 15.1% are between the ages of 21-30 years and under 20 years, respectively. This category accounts for the students' population, consisting of pre-degree students, undergraduates, and postgraduate students. About 11.6% and 15.3% of respondents were between the age bracket of 31-40 years and 41-50 years, respectively. However, the remaining 13.9% of respondents were 51 years above. These are mainly staff (academic and non-academic staff). This age distribution signifies the involvement of all categories of ages in this research. However, the higher percentage recorded between age category 21-30years and 20 years below is a typical reflection of the age availability within a tertiary institution as expected.

Gender of Respondents:
The gender distribution of respondents in the selected universities, as presented in Table 1 shows that 58.4% of the respondents were male, while 41.6% of the respondents were female. This result suggests that both genders were represented in this research and allowed to examine the senate building facades' height perception in selected universities in southwest Nigeria.

Marital Status of Respondents:
The marital status of respondents in the selected university, as presented in Table 1 revealed that more singles are constituting 52.7% of the respondents. In comparison, the remaining 44.5% and 2.8% of respondents' were married and divorced.

Status of Respondents in the University:
The status of respondents in the selected university as presented in Table 1 shows that 35.5% of the respondents were staff (including, academic, non-academic, senior and junior staff), while the remaining 64.5% of the

respondents' consist of pre-degree students, undergraduate, and postgraduate students. The result shows a higher representation of students as expected in every school with a higher percentage of students.

Academic Qualification of the Respondents:
The respondents' academic qualifications in each university selected for the study in Table 1 reveals that 42.3% of the total respondents had B.Sc/HND. Furthermore, 10.4% of the respondents had a Master's degree, 9.9% had OND, 14.8% had SSC, and 2.6% had a PhD. The result shows a good spread in respondents' academic qualification for divergent opinions to be achieved across the academic qualification line. However, the highest category being the B.Sc/HND holders indicates that the respondents are predominantly postgraduate students with many years within the university environment. This outcome implies a good understanding of the expected judgement of façade aesthetics.

Respondents' Average Monthly Income:
The respondents' average monthly income from the selected universities as presented in Table 1 reveals that 23.1% of respondents' earned N50,000 or less monthly, and 27.6% of the respondents' earned between N50,001-N99,000 monthly. Furthermore, 12.9% of respondents' received between N100,000-N149,000 monthly, 9.4% had income between N150,000-N199,000, while the remaining 27% of respondents had an income of N200,000 and above monthly. The result suggests that the questionnaire were distributed across different income group.

Length of Stay of Respondents:
The respondents' estimated length of stay in the selected university as presented in Table 1 shows that 28.2% of the respondents had spent less than four years in the university. In comparison, 18.0% of respondents had spent between 4 to 8 years in the university. This category accounts for the pre-degree, undergraduates and part of the postgraduate students, respectively. About 18.7% have spent between 8 to 12 years, while about 10.6% of respondents have spent 16-20 years in the universities. The remaining 10.7% of respondents have spent above 20 years within the study area. This second group accounts for the staff population majorly. The distribution of length of stay of the respondents indicates that majority of the respondents are familiar with the universities. This result will be advantageous for the evaluation and perception of the senate building façade height.

Influence of Socioeconomic Characteristics on Façade Colour Visual Quality Assessment
This sub-section examined the influence of the users' socioeconomic characteristics on the façade colour assessment in the study area. The dependent variable was the façade colour assessment of selected university Senate buildings, while the independent variables comprised seven variables. The seven independent variables consist of the users' socioeconomic characteristics, as presented in Table 2, were included in the CATREG. They are age group, gender, marital status, university status, highest academic qualification, income level per month, and length of stay.

The analysis results reveal that four of the seven variables investigated emerged as significant predictors influencing the visual quality assessment of façade colours with $F = 3.769$, $p < 0.000$. The Model Summary shows that the model having $R2 = 0.121$ explained 12.1% of the variance in the influence of the socioeconomic characteristics on the visual quality assessment of façade colour. Table 2 presents the coefficients of the regression analysis.

Table 2:- Coefficients of the Multiple Regression Analysis on Façade Colour Assessment.

Coefficients					
Socioeconomic Characteristics of Respondents	Standardised Coefficients		df	F	Sig.
	Beta	Bootstrap (1000) Estimate of Std. Error			
Age Group	.334	.060	4	30.614	.000*
Gender	.056	.037	1	2.256	.134
Marital Status	.178	.080	2	4.946	.007*
Status in the University	.132	.106	1	1.538	.215
Highest Academic Qualification	.157	.051	4	9.331	.000*
Income level per month	.196	.068	4	8.334	.000*
length of stay	.052	.032	5	2.616	.024*

* *Significant Predictors*

From the result in Table 2, it is evident that the four significant predictors of façade colour visual quality assessment are age group, marital status, highest academic qualification, and income level. These are significant factors that are less than 0.05 acceptability scores.

The result in Table 2 also shows the level of contribution of respondents' four socioeconomic characteristics in explaining façade colour visual quality assessment. From the beta (β) values, it is evident that the users' age group (β = 0.334, p=0.000) makes the highest contribution to explaining the façade colour visual quality assessment. This is followed by the income level per month of the users (β = 0.196, p=0.000), Highest Academic Qualification (β = 0.157, p=0.000), marital status of the users (β = 0.178, p=0.007), and the length of stay (β = 0.052, p=0.024), respectively. Table 2 shows that gender and status in the university are not strong predictors of the façade colour visual quality assessment of selected university Senate buildings in Southwest Nigeria.

Influence of Socioeconomic Characteristics on Façade Height Visual Quality Assessment

This sub-section examined the influence of the users' socioeconomic characteristics on façade height assessment in the study area. The dependent variable was the facade height assessment of selected university Senate buildings. The seven independent variables consisted of the users' socioeconomic characteristics, as presented in Table 3, were included in the CATREG. They are age group, gender, marital status, university status, highest academic qualification, income level per month, and length of stay.

The analysis results reveal that four of the seven variables investigated emerged as significant predictors influencing the visual quality assessment of façade height with F =3.450, p < 0.000 (see ANOVA Table in Appendix 8). The Model Summary (see Appendix 8) shows that the model having R2 = 0.107 explained 10.7% of the variance in the influence of the socioeconomic characteristics on the visual quality assessment of façade colour. Table 3 presents the coefficients of the regression analysis.

Table 3:- Coefficients of the Multiple Regression Analysis on Facade Height Assessment.

Coefficients					
Socioeconomic Characteristics of Respondents	Standardised Coefficients		df	F	Sig.
	Beta	Bootstrap (1000) Estimate of Std. Error			
Age Group	.260	.062	4	17.393	.000*
Gender	.026	.031	1	.669	.414
Marital Status	.158	.070	2	5.135	.006*
Status in the University	.110	.082	1	1.802	.180
Highest Academic Qualification	.223	.052	4	18.134	.000*
Income level per month	.149	.060	4	6.086	.000*
length of stay	.044	.031	4	1.965	.098

* *Significant Predictors*

From the result in Table 3, it is evident that the four significant predictors of building height visual quality assessment are age group, marital status, highest academic qualification, and income level. These are significant factors that are less than 0.05 acceptability score.

The result in Table 3 also shows the level of contribution of respondents' four socioeconomic characteristics in explaining façade colour visual quality assessment. From the beta (β) values, it is evident that the users' age group (β = 0.260, p=0.000) makes the highest contribution to explaining the building height visual quality assessment. This is followed by the highest academic qualification (β = 0.223, p=0.000), income level per month of the users (β = 0.149, p=0.000) and the marital status of the users (β = 0.158, p=0.006), respectively. It is observed from the result in Table 3 that gender, status in university, and length of stay are not strong predictors of the façade colour visual quality assessment of selected university Senate buildings in Southwest Nigeria.

Influence of Socioeconomic Characteristics on Façade Shape Visual Quality Assessment

This sub-section examined the influence of the users' socioeconomic characteristics on the façade shape assessment in the study area. The dependent variable was the façade shape assessment of selected university Senate buildings, while the independent variables comprised seven variables. The seven independent variables consisted of the

socioeconomic characteristics of the users, as presented in Table 4. They are age group, gender, marital status, university status, highest academic qualification, income level per month, and length of stay.

Table 4:- Coefficients of the Multiple Regression Analysis on Façade Shape Assessment.

Coefficients					
Socioeconomic Characteristics of Respondents	Standardised Coefficients		df	F	Sig.
	Beta	Bootstrap (1000) Estimate of Std. Error			
Age Group	.200	.053	4	14.287	.000*
Gender	.014	.027	1	.264	.608
Marital Status	.063	.044	2	2.044	.130
Status in the University	.046	.054	1	.712	.399
Highest Academic Qualification	.239	.040	4	34.896	.000*
Income level per month	.164	.050	4	10.916	.000*
length of stay	.092	.038	5	5.963	.000*

* *Significant Predictors*

The analysis results reveal that 4 of the seven variables investigated emerged as significant predictors influencing the visual quality assessment of façade shape with $F = 4.038$, $p < 0.000$. The Model Summary shows that the model having $R2 = 0.128$ explained 12.8% of the variance in the influence of the socioeconomic characteristics on the visual quality assessment of façade shape. Table 4 presents the coefficients of the regression analysis.

From the result in Table 4, it is evident that the four significant predictors of façade shape visual quality assessment are age group, highest academic qualification, income level per month, and length of stay. These are significant factors that are less than 0.05 acceptability score.

The result in Table 4 also shows the level of contribution of respondents' four socioeconomic characteristics in explaining the façade shape visual quality assessment. From the beta (β) values, it is evident that the users' highest academic qualification ($\beta = 0.239$, $p=0.000$) makes the highest contribution to explaining the building shape visual quality assessment. This is followed by the age group ($\beta = 0.200$, $p=0.000$), income level per month of the users ($\beta = 0.164$, $p=0.000$) and the length of stay ($\beta = 0.092$, $p=0.006$) respectively. The factor with the least contribution is gender ($\beta = 0.014$, $p= 0.608$). It is observed from the result in Table 4 that gender, marital status, and status in the university are not strong predictors of the façade shape visual quality assessment of selected university Senate buildings in Southwest Nigeria.

Discussions:-

Age as a significant predictor was not surprising. This position is attributed to about 70.9% of respondents being below the age of 40years. This age group is the most active, energetic and curious age interested in aesthetics and current trends. There is a great affinity for physical admiration and recognition among this age category, especially 30years and below.

This position conforms with the finding of similar studies by Safarova et al. (2019) in residential building façade evaluation where the age limit of 21 to 28 years was considered significant. Also, Ghomeshi and Jusan (2013) in residential building façade conceptual properties assessment; Chen et al. (2016) in a forest scenic beauty estimation emphasised ages between 19 and 57 years; Jennath and Nidhishi (2016) for library building façade specified age group between 18 to 23 years to represent the current generation. Others are Kalayci and Bilir (2016) in police station façade studies; Askari and Soltani (2018) in façade and street attractivenessconsidered age categorisation of between 18 to 50 years and above; Santosa and Fauziah (2017) in restaurant façade aesthetic emphasised restrictions of respondents' age to 18 years and above.

However, age as a significant predictor of VQA is inconsistent with Pouya and Behbahani (2017) views in the qualitative study of landscape perception. Although age was not mentioned emphatically as a socioeconomic factor, the selection of 35 senior university students indicates age consideration. Ilbeiga and Ghomeisha (2017) also in a qualitative study of residential façade conceptual properties did not emphasise age but adopted a systematic random

method for selecting respondents. However, the selection initiated in a university environment suggests that matured students were considered and age is indirectly applicable.

Highest Academic Qualification also called education level, is a predictor of VQA of façade elements. This position can be attributed to the study context being an academic environment and the minimum qualification of all participants being a secondary school certificate. The implication is that all participants have a reasonable level of education, and literate people understand the importance of shaping their community. Education also tends to increase peoples' curiosity on events in their environment and increase their desire for participation.

The general construct of visual studies observed emphatically considered educational or academic qualification of respondents. This position confirms this study's findings by most visual studies done in higher institutions of learning with students as respondents. For instance, Liu and Chuang (2014) did an aesthetic evaluation of architectural space with college students from Taiwan. Safarova et al. (2019) engaged students from Brno University of Technology, Czech Republic. Also, Ghomeshi and Jusan (2013), engaged students of university Technologi, Malaysia as respondent.Jennath and Nidhish (2016) on library facades engaged students of Rajiv Ganghi Institute of technology, India. Although academic qualification was not indicated emphatically in this study, the study's context suggests its importance.

Income Level was also a significant predictor of VQA. This view was against expectation because a university environment being predominantly a student community with students expected to be on sponsorship in one form or the other. The students may not be high-income earners predominantly, but they still understand the importance of their contribution to their immediate environment and expected outlook. Furthermore, the participant population has working-class postgraduate students and staff of the university inclusive. In support of income level as a predictor, Fakere and Ayoola (2018) suggested that participation in infrastructural projects requires finance and a level of income promotes decision-making involvement. This position is also in consonance with Rezafar and Turk (2018) that considered monthly income in the aesthetic assessment of the recently built environment with urban design factors and legislation. The 137 respondents considered in the study comprised of architects, designers and municipal government officials. This study focused on respondent from the working class sector with requisite experience in the field of study.

However, this study's finding does not conform to Kalayci and Bilir (2016) in police station façade study with 133 respondents consisting of teachers, architects, and police officers.

Although the study considered the experienced working class, their income level was insignificant. The study instead focused on gender, age, educational level, occupation, and experience. Others are familiarity with police friends, buildings and visit to a police building. Also, Askari and Soltani (2018) in a study on building facades and street attractiveness considered a mixed multitude of 330 respondents based on familiarity with the location, gender ratio and age. Their income level was insignificant. Other visual studies considered inconsistent with the income level as a finding of this study were predominantly studies with students as respondent (Mutlu&Kiran, 2020; Jennath&Nidhish, 2016; Chen et al., 2016).

Conclusion:-

The study gave an overview of the importance of engaging users in building façade aesthetic judgement. The users' invariably connotes their socioeconomic characteristics as an essential distinguishing factor in human perception. Socioeconomic characteristics are numerous, but understanding the vital determining characteristics saves time and energy and ultimately guarantees the success of the architectural product visually. The three socioeconomic predictors of building aesthetic perception from this study are age, academic qualification and income level. This study's findings imply that visual studies are achievable with significant consideration for age and academic qualification (i.e. educational level). These two ensures that respondents have a good understanding of the study in question and can respond to a quantitative study virtually with minimal supervision. On the other hand, income level is best applicable to visual studies involving respondent from the working class sector predominantly, where their income level can be easily related to their visual perception.

The study has provided empirical evidence on users' socioeconomic characteristics influencing the visual quality assessment of university Senate building facades in Southwest Nigeria. These contribute to data monitoring and accountability, which are crucial in sustainable development as contained in the SDG 17, subsection 18. Data on the significant factors influencing visual quality judgement is an addition to the targeted capacity-building support to the developing countries. This outcome aids the availability of quality, timely and reliable data specific to a

geographical location significantly. These can be adopted for future preliminary information gathering for project initiation by planners and designers to aid design simulations to elicit a response from users or public.

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