



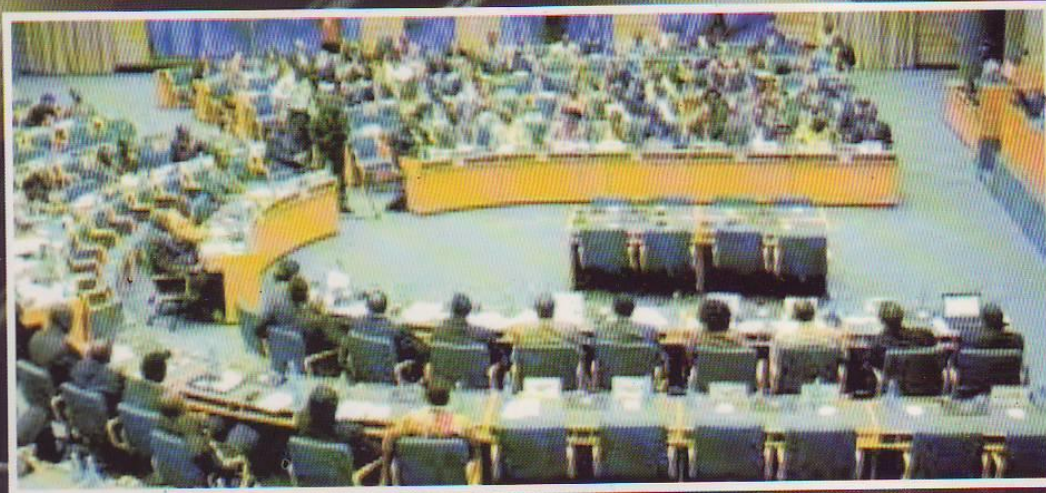
iSTEAMS Research Nexus 2013

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BOOK OF PROCEEDINGS

Proceedings Series 4



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BOOK OF PROCEEDINGS

SERIES 4

International Science, Technology, Education, Arts, Management & Social
Sciences
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**Beyond the Sparks -
Reshaping Research & Human Development in Africa through Digital
Innovations**

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University of Ibadan, Ibadan, Nigeria

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Psychometric Analysis on Sustainability Awareness and Integration in Managing Higher Educational Institutions in Nigeria

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ABSTRACT

Sustainability is a concept moving round in conferences and as an important headword in higher educational curriculum especially environmental study and economics. This concept is understood as „capable of being sustained“ (Franklin and Blyton, 2011). This study investigates the sustainability awareness and integration in managing educational institutions among students of Nigerian Higher Education Institutions (NHEI). The research employs Factor Analysis technique to confirm the sustainability awareness and integration in higher education institutions. The findings indicated that sustainability awareness and integration occur and appears in educational curriculum mostly environmental study and economic. The study suggested that the concept should firmly internalize in management of NHEI for quality achievement in educational services.

Keywords: Sustainability, Awareness, Integration, Quality service

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1. INTRODUCTION

An obvious starting point about sustainability is on definition of this phenomenon and level of awareness and integration in our educational institutions most especially in institution of higher learning. It is a concept that remains challenged since 1980s where there are has been a noticeable shift in thinking from environmental conception of sustainability to a more three- dimensions of the concept which are environmental, social and

economic sustainability. Although, the concept embraced through wider approach of sustainable development, which understood as improving the standard and improving quality of life into the long term future (UNECD, 1992). Several studies have been done which indicated that higher education institution needs to integrate the concept together with their curriculum and based on firm awareness among sustainability concerns.

There are evidences of integrating the concept in curriculum but awareness about this concept requires all concerns taken the task as major responsibility in order to achieve the long term future of quality service provided in higher educational institutions. People thought that sustainability is only for science in term of pollution, climate change, deforestation, internet connectivity and many other environmental problems.

According to Franklin and Blyton, (2011) there is now a growing acceptance of the need to complement this concept with an enhanced understanding of the impact of social and economic systems, practices and behaviours. To the extent of studying the activities of community, group to achieve sustainability goal. However, the purpose of this study is to examine the concept of sustainability in HEI through awareness and integration among student for successful understanding and achievement of long term future. This study empirically implemented Factor Analysis to investigate the sustainability dimensions based on the awareness and integration in HEI. And to strengthen level of quality founds steadily lacking in deliver quality service in NHEI (Ajayi and Akindutire, 2007).

1.1 Conceptualizing Sustainability notion in HEI

As sustainability is seeking for effective changes, there should be more understanding about what sustainability entails and its contribution to the society. This has led scholars to assert that there is need for contemporary meaning and to priorities for accessibility to real meaning. Clearly, Sustainability is a notion of „sustaining" which implies an intention to do so (Franklin and Blyton, 2011). Sustainability retains the realizing of quality services for customer satisfaction in any HEI activities. It is true sustainability define in many ways main fact is living, working and deliver quality services as an output which emphasis on not jeopardizing the long term planning of HEI (Sadler, 2003).

Meanwhile, Gladwin, et. al., (1995) define sustainability as the akin of democracy, liberty, equality, or security in this regard. It is also claim as sustainable development understanding through interaction within and between economic, social, and ecological systems. Thus, sustainability is word of „sustainable" which has it root from physical and concrete aspects of our everyday lives. It could be applied in any form of discipline in order to sustain the quality that is lacking in setting goal for the institutions. Sustainability initiatives and its conceptual framework

Considering Hopwood, et. al., (2005) framework for mapping sustainability initiatives, the approach enhances in understanding, contribute towards the development of social equity; contribute towards eco-centrism and concern for the protection or enhancement of environmental quality. However, Gladwin, et. al., (1995) stress that sustainability concept contributes towards five components which were presented across the sustainability definition such as; Inclusiveness, Connectivity, Equity, Prudence, and Security.

The understanding is to appreciate that sustainability promote greater social equity and enhances in deliver quality in any form of organization. Similarly, this framework implies that all sustainable development initiatives will be progressive on at least one dimensions (either environment, economy, social), and to create effective management. This is the datum hypothesis making this study concentrate on social dimension for quality achievement in higher education management. Moreover, quality of education could be measured through measuring parameters of quality input, quality output, quality content, and quality process.

According to Emanuel and Adams, (2011) quality could be achieved through sustainability awareness and integration into managerial aspect of HEI and at the same time integrates the concept in curriculum for student sustainable development. The fact is that institutions of higher learning have long-served society as leaders and innovators in research, discovery, and social responsibility. Thus, over 600 universities have committed their leadership and quality deliver through sustainability awareness and integration in HEI around the world, instance of Bologna Charter, Talloires Declaration, Halifax Declaration and the Copernicus Charter for Sustainable development (Emanuel and Adams, 2011).

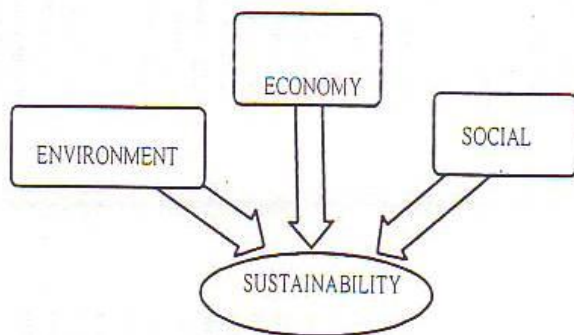


Fig. 1: Sustainability Dimensions

2. PREVIOUS RESEARCH ON SUSTAINABILITY AWARENESS AND INTEGRATION

Franklin and Blyton, (2011) emphasized that the characteristic of sustainability research is intentional in the sense that it contributes to the pursuit of sustainability rather than just understand it. The fact is the establishment of „education for sustainability development“ (ESD), “which takes a sustainability approach towards educational processes and skills rather than simply “teaching” about sustainability topics in institutions (Franklin and Blyton, 2011:23).

However, the research on awareness and integration dominated in order to understand the level of sustainability in HEI. Kurland (2011) examines the evolution of a sustainability in California public university from 2007-2010. The respondent includes the students. The researcher explains the evolution of sustainability in this campus started from 1980s, 1994 until its current state - May 2010. The findings indicate that the key informants defined success in campus sustainability as an action which increases efficiency, educate and prepare graduates for a fundamentally different world, achieve broad-based support, and improve the university's sustainability image (Kurland, 2011).

Furthermore, Lozano, (2011) carryout research on state of sustainability in HEI, the researcher analysis the performance level of 12 universities sustainability reports using the Graphical Assessment of Sustainability in Universities tool. The publication used dated 2005-2009 among UK, Austria, Spain, Sweden, China, Germany, Peru, Singapore, and Finland. Findings show that sustainability report in universities is still in its early stages meaning that there is no increase in HEI level of understanding and level of improvement report compare to that of corporate sector's report. Thus, finding indicates that HEI should learn from corporate sectors constant reporting of sustainability achievement for more awareness and integration in HEI activities.

Moreover, research has been revealed that consistently larger proportion of students expressed concerned for and willing to participate in sustainable practices. Research done on Hawaii and Alabama Universities with sample size of 406 undergraduate students at two universities in Alabama (n=258) and community college in Hawaii (n=148).

Emanuel and Adams, (2011) found that “there seems to be little or no „Knowledge gap” when it comes to campus sustainability, but there does seem to be a „commitment gap”. Similarly, the researchers found that the most likely explanation for this gap may be that student responses are reflecting the state of sustainable practices in the educational community where the campus located”. With regard to Emanuel and Adams findings, this present research strives to examine the extent of awareness and integration of sustainability concept among Nigerian students.

3. METHODOLOGY

To address the research questions is to identify the sustainability awareness and level of integration in HEI. These are among the major parameters to measure sustainability in HEI. Two campuses were selected in Nigeria: ATBU, Bauchi and The Polytechnic Ibadan Campus. The survey questionnaires were distributed among HEI student of 300 sampling based on awareness and integration of sustainability concept for quality service and in curricula. However, this study takes the approach of explaining the meaning of sustainability according to Wright (2010) research which involved 29 Canadian University presidents and vice-presidents whose institutions are among the signatories to the Talloires declaration on sustainability. Which defines that majority of participants is well aware of the sustainable development but „less familiar with the concept of sustainability” of HEI (Wright, 2010). Thus, sample demographics are described and survey results are organized mainly on three key research questions. Only 20 statement questions employed which the content is on awareness and integration.

3.1 Validity and Reliability Analysis

Validity and reliability were done to understand the internal consistency as emphasized that reliability is the extent to which a research instrument or method is repeatable (Bartlett and Burton, 2007) while, Corbetta, (2003) states that reliability is the degree to which a

given procedure for transforming a concept into a variable produces the same results in tests repeated with the same empirical tools (stability) or equivalent one. Content Validity was applied to the questionnaire with the help of statistic expertise in the faculty of Education.

This is to identify the ambiguous words while some words were replaced for clear and understanding by the respondents. Data collected was run through SPSS20 version to clearly indicate that validity is measured empirically by the correlation which is theoretically defined that sustainability requires awareness and integration (Wright, 2010). Hence, table (3) of factor Analysis indicate the instrument clearly measure sustainability through awareness items and integration items (Hairs, et. al., 1998).

Reliability statistics was done using Cronbach alpha on sustainability as a factor (Table 2) where total items revealed; Cronbach alpha 0.974 with 20 items on sustainability. The table 1 shows the reliability statistic of the study. Thus, the result indicated that the research questions were good to proceed in the analysis. According to Hairs, et al., (1998:118) generally agreed upon limit for

Table 1: Reliability of the Construct

Construct	Items	Cronbach Alpha
Sustainability	Sh1	.974

3.2 Factor Analysis

After assessment of the suitability data, factor analysis was employed with Varimax. Rotation was done to identify the underlying factors. Sustainability construct was run only the factors with Eigenvalues of 1.0 and greater were retained. With reference to Hair's (1998) factor loading and total number of responses (207 usable) enables the researcher to set the criteria; that all items less than 0.6 should be deleted.

As a result, there was an indication of good inter-correlation among the items that justified the uses of Factor Analysis. The correlation matrix result of the initial analysis shows some correlations of $r=0.3$ or greater while its $p<.05$ (Tabachnick, B. G., & Fidell, L. S. 2001 cited in Pallant, 2007). Through the initial analysis, the researcher observes cross-loading under criteria set of 0.4, while the analysis suggest to remove the cross loading items of (SH15, SH8, and SH1), thus, the study was statistically significant. Communalities of the second analysis revealed that there were no items extracted lower than 0.6. The output of the analysis of the items were fit at suppressing value of 0.6 that include the Bartlett's Test of Sphericity value, which was significant at 0.000, the determinant value at 0.001, and the anti-image observes to be greater than 0.5.

These show that factor analysis is appropriate and it is supporting the factorability of the correlation matrix (Pallant, 2007: 190), the overall MSA i.e. Kaiser-Meyer-Olkin Measure of sampling Adequacy was 0.894 accepted for educational purposes. Table 2 and 3 show the results below

Table 2: KMO and Bartlett's Test for Sustainability Awareness and Integration (SH) Kaiser-Meyer-Olkin Measure of Sampling Adequacy .894

Bartlett's Test of	Approx. Chi-Square	682.775
	DF	136
	Sig.	.000

Thus, sustainability items would undergo descriptive only in order to identify the total frequency of agreement and disagreement among respondents on level of sustainability awareness and integration for quality achievement in HEI. Total variance explain by (SH) variables is 82.9% with total record of two (Awareness and Integration of sustainability concept) in table 3.

Table 3: Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Va	Cumm %	Total	% of Var	Cumm %	Total	% of Var	Cumm %
1	12.342	72.601	72.601	12.342	72.601	72.601	9.598	56.458	56.458
2	1.751	10.302	82.903	1.751	10.302	82.903	4.496	26.445	82.903

Extraction Method: Principal Component Analysis.

Meanwhile, two components of SH were re-named as (Shi-sustainability integration, SHA-sustainability awareness) total recorded were 12.342, 1.751 respectively. Finally, Table 4 shows the final items for answering the research questions where each component was renamed based on loaded items. While, table 5a,b measures the reliability of new rename variables of Sustainability concept as follows.

Table 4: Rotated Component

	Component	
	1=Shi	2=SHA
SH7	.903	
SH14	.896	
SH11	.874	
SH16	.865	
SH13	.863	
SH6	.855	
SH12	.849	
SH4	.827	
SH5	.824	
SH2	.815	
SH10	.785	
SH9	.776	
SH3	.756	
SH18		.911
SH17		.901
SH19		.896
SH20		.842

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

4. RESULTS AND DISCUSSIONS

Descriptive Statistics for Research Questions

The percentage rate of the respondent's opinion simplifies the findings which indicate the level of achievement and the importance of sustainability awareness and integration in HEI. The frequency (N), Percentage (%), Mean (M) and Standard deviation (SD) elucidates more on the extent. However, the seven likert scales merge into three scales for simplicity of the findings in order to understand what sustainability perceived and level of awareness by the students. Therefore, Table 6.1 and 6.2 below show the results and discussions based on the research questions.

RQ1. To what extent does sustainability integration enhances in managing HEI?

Table 5(a,b)

Renamed Construct Reliability:
Sustainability Awareness: SHA
Sustainability Integration: SHI

Table 5a: Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No of Items
.962	.963	4

Table 5b: Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on	No of Items
.929	on	13

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Table 6.1: Sustainability integration (SHi)

Items	loading	Disagree N	Neutral N	Agree N	M	SD
SH7 sustainability integration appears in HEI		75	41	91	4.077	2.020
SH14 sustainability integration keeps management in real direction in managing HEI		107 51.7	35 16.9	65 31.4	3.705	2.140
SH11 sustainability integration support management action		110	27	70	3.585	1.931
SH16 sustainability integration is responsibility of all students and management		96 51.2	12 5.8	89 42.6	3.701	2.178
SH13 sustainability integration create a sustainable campus if		73 35.3	33 15.9	101 48.8	3.802	1.886
SH6 sustainability integration keep management of HEI pursue quality		106	21	80	3.676	2.092
SH12 sustainability integration improves exposure in meeting		108 52.2	32 15.5	67 32.3	3.570	1.863
SH4 sustainability integration is important in managing educational		116	17	74	3.435	2.025
SH5 sustainability integration is a direction towards high service		105	26	76	3.502	2.115
SH2 sustainability integration enhances management to pursue		85	34	88	3.643	2.019
SH10 sustainability integration have impact in management		119	10	78	3.551	2.352
SH9 sustainability is headword in most courses in economic and management learning and		75 36.2	41 19.8	91 44.0	4.077	2.020
SH3 sustainability integration appears in environmental		84 40.7	33 15.9	90 43.4	3.841	2.014

N=frequency, %=percentage

From the result shown in the table 6.1, the respondents expressed their opinion that sustainability integration appears in HEI curriculum, where (91, 44%) agreed, only (75, 36.2%) disagree, while (41, 19.8%) of the respondents were neutral. Majority of the respondents (101, 48.8%) expressed that sustainability integration creates a sustainable campus if prioritized only (73, 35.3%) respondents disagree to the statement

that sustainability integration create a sustainable campus if prioritized. Similarly, more than one-third of the respondents (88, 42.5%) express their agreement that sustainability integration enhances management to pursue quality. The level of agreement of the respondents (88, 42.5%) showed a good indication of achieving quality if sustainability integrated by management to pursue quality in HEI.

While the interval between agreements and disagree of respondents (85, 41.0%) based on the statement that sustainability integration enhances management to pursue quality not much, only (34, 16.4%) respondents are neutral to the statement of sustainability integration enhances management to pursue quality. Admittedly, (91, 44.0%) respondents supported that sustainability is headword in most courses in economic and management learning and teaching activities in HEI.

Moreover, above one-quarter of the respondents (90, 43.4%) agreed that sustainability integration appears in environmental management courses. However, the finding from this research indicates that sustainability integration appears in management courses program and it is an advantage to create new changes for managing HEI. Integration of sustainability concept is assurance of quality by excellent leaders and as major way to achieve the vision for reputable HEI (Lasisi and Hairuddin, 2010).

RQ2. To what extent does sustainability awareness enhances in managing HEI?

Table 6.2: Sustainability Awareness (SHA)

Items	Loading	Disagree N %	Neutral N %	Agree N %	M	SD
SH18 sustainability awareness changes resistance attitude towards	.911	92 44.4	20 9.7	95 45.9	3.957	2.197
SH17 sustainability awareness supports improvement of courses	.901	87 42.1	13 6.3	107 51.6	4.193	2.179
SH19 sustainability awareness is responsibility of all in HEI	.896	74 35.8	32 15.5	91 48.8	4.121	2.067
SH20 sustainability awareness prioritized in managing HEI	.842	88 42.5	33 15.9	86 41.5	3.990	2.072

N=frequency, %=percentage

Sustainability is a process in which sustainable development been shared and ideas of quality achievement in HEI. It is also the art of removing barriers of resistance to change in managing HEI towards quality achievement. However, table 6.2 uncovered the extent to which sustainability awareness being achieved in HEI. The respondents expressed their opinion that sustainability awareness changes resistance attitude towards quality achievement. Where only (92, 44.4%) expressed that sustainability awareness not changes resistance attitude towards quality achievement in HEI.

More than one-sixth of the respondents (95, 45.9%) accepted that sustainability awareness changes resistance attitude towards quality achievement while, only (20,9.7%) respondent of opinion of neutral. The research indicated that sustainability awareness supports improvement of courses offer in HEI. It is advantageous because it provides better skills to confronting any leading challenges in future. Besides, more than 106 respondents identify their level of agreement. Similarly, the respondents (107, 51.6%) emphasized that sustainability awareness supports improvement of courses offer.

Thus, finding shows that sustainability awareness needs to be prioritized in managing HEI. This because (86, 41.5%) respondents agreed that sustainability awareness prioritized in managing HEI. Meanwhile, only (88, 42.5%) disagreed that sustainability awareness prioritized in managing HEI. Additionally, (91, 48.8%) respondents agreed that sustainability awareness is responsibility of all in HEI greater than (74,35.8%) respondents who disagreed that sustainability awareness is responsibility of all in HEI.

5. CONCLUSION

Sustainability is an idea of „sustaining“ which implies target of quality accomplishments in HEI (Franklin and Blyton, 2011). Emanuel and Adams, (2011) found that “there seems to be little or no „Knowledge gap“ when it comes to campus sustainability, but there does seem to be a commitment gap“. Sustainability integration creates a sustainable campus if prioritized by the management of HEI. Considering achieving quality if sustainability integrated by management to pursue quality in HEI.

However, sustainability integration appears in management of courses program. Although, sustainability awareness is responsibility of all but needs awareness and should be prioritized in managing HEI. Social sustainability give the research to understand the extent of awareness and integration in HEI, the same research indicated that studying part of HEI is insufficient. It requires future research to studying more HEIs for generalizability and should test other factors beyond awareness and integration.

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BOOK OF PROCEEDINGS SERIES 4

International Science, Technology, Education, Arts,
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(iSTEAMS) Research Nexus Conference, 2013

Theme

Beyond the Sparks - Reshaping Research & Human Development in Africa through Digital Innovations

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The Conference Centre
University of Ibadan, Ibadan, Nigeria

Date:

May 30th – June 1st, 2013.

Organized By

- Research Nexus Africa
- The Creative Research & Technology Evaluation Networks *in Partnership with*
- The African Institute of Development Informatics & Policy, Ghana

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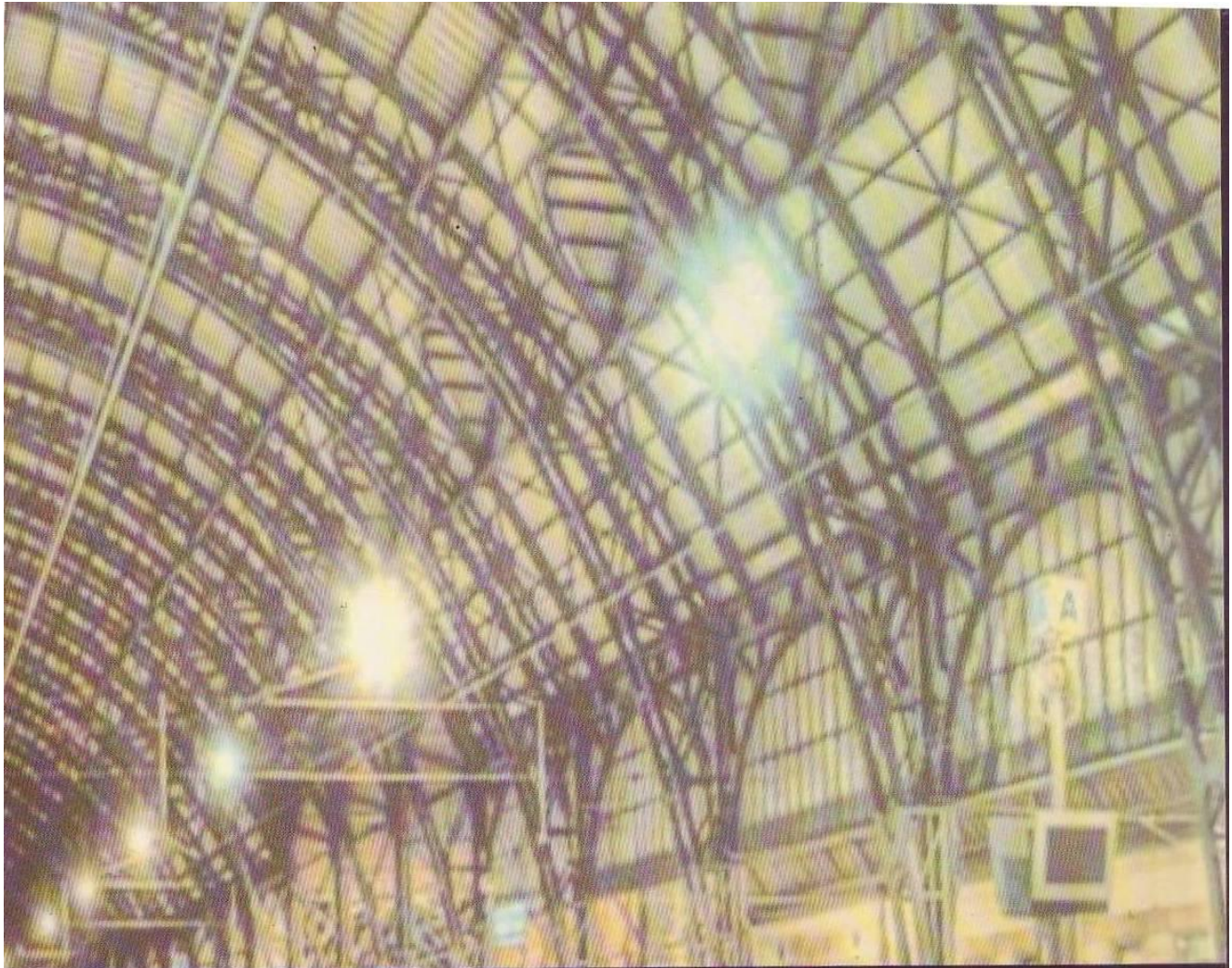
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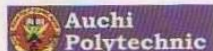
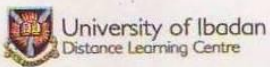


This conference is jointly organized by the Research Nexus Africa,
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