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PERSONAL ATTRIBUTES AND THE RELATIONSHIP BETWEEN EMERGING BUILDING MANAGEMENT SKILLS AND EMPLOYABILITY OF BUILDING GRADUATES IN AKWA IBOM STATE

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ABSTRACT

Purpose: The study determined the extent to which personal attributes moderate the relationship between emerging building management skills and the employability of building technology graduates in Akwa Ibom State.

Design/methodology/approach: The descriptive survey research design was employed for the study. Krejcie and Morgan was used to determine a sample size of 213 respondents drawn from a population of 707 respondents. This comprises lecturers, building experts as well as Building technology graduates in Akwa Ibom State. Multistage sampling was utilized for the study. The researcher developed instruments titled "Emerging Building Management and Employability Skills Questionnaire (EBMESQ)" and the "Building Graduates Personal Attributes Questionnaire (BDGPAQ)" for data collection. The developed instruments were validated by experts in the Department of Building, University of Uyo, and the test-retest method was used to determine the reliability of the instruments. The instruments were tested on 40 respondents twice and Cronbach alpha was used to compute the reliability index which gave values of 0.88 and 0.83 respectively. Data for the study was collected and analyzed using multiple regression analysis and structural equation modelling (SEM)..

Findings: Findings from the analysis showed a very weak positive relationship between building management skills and employability. It also showed that there is a positive but not significant moderating effect of personal attributes of graduates on the relationship between emerging building management skills and employability of graduates.

Practical implications: Based on the findings, it was recommended that tertiary institutions should establish industry-academia partnerships that allows for fruitful exchanges, supporting skills development and curriculum innovation.

Keywords: Building management skills; employability skills; professionalism; self-management; structural equation modelling.

1. INTRODUCTION

In the context of economic globalization, student skills development for employability is now of international relevance across higher education, governments and industry. However, Gesa and Coralie (2017) points out an increasing research and skills gap between skills possessed by building technology students and what is demanded by employers. This is exacerbated by the adoption of emerging building technologies into the field of building construction and management. The adoption of new technologies in the building industry invariably places a demand for new sets of skills. Every new technology

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adopted by industries requires that trainees and practitioners develop new and appropriate skills to increase their employability (Ibrahim & Geoffrey, 2020).

Furthermore, skills development is still very much a function of personal effort. Also, employability can be determined by the individual inputs. As such, personal efforts or personal attributes are human factors that can moderate skills development and employability of graduates in the building and construction industry.

According to Donohoe (2020), the building and construction labour market skills requirements are constantly changing. The mismatch between graduate skills and the labour market requirements is widening across Nigeria. The roles of building professionals are also of dynamic nature and they are in need of continuous development of skills and competencies to perform in the labour market effectively. Due to the inherent complexities of construction industries coupled with the challenges of global competitiveness, constantly evolving technologies and diversity of employment opportunities, building technology graduates need to have a portfolio of key skills that will make them immediately employable, graduates are failing to take advantage of skills training. Okoye and Caleb **(**2019) observed that most building technology graduates lack employability skills to find and keep jobs in their trained professions. Without proper identification of these skills and subsequent integration into training, building students and graduates will continue to fall short of employment. There is also a widening gap between the emerging building management skills employers are seeking for and what job seekers possess. The core skills in building management still remains, but new technologies are introducing new skills and where students fail to develop these skills, they lower their employability (Hassan, *et al*, 2017).

The problem of this study is that the extent to which personal attributes can moderate the relationship between emerging building management skills and employability of building technology graduates have not been established in the study area (Akwa Ibom State). The problem is seen to contribute to the challenge of training of students and the consequent lack of employability skills of graduates in Akwa Ibom State. Furthermore, it is observed that while graduates have certain desirable personal traits, there seem to be certain personal attributes that are essential for success in the building management industry that needs to be identified and developed by graduates and job seekers. Failure to identify these personal attributes and hone them, might lead to skills mismatch in the near future. Caleb and Udofia (2013) agrees that there is a clear link between employability and building management skills and the later does influence the former. However, when viewed with respect to the effect of personal attributes, it becomes unclear how personal attributes might impact on the relationship between emerging building management skills and the employability of building technology graduates in Akwa Ibom State.

Overall, the study on building management skills highlights the critical need for evaluating the skills required to excel in smart and modern construction, where technology driven processes become a key consideration. The research suggests that the change will be inevitable, especially due to the rapid technology development with the involvement of robotics and artificial intelligence, heavy reluctance of workers to be a part of the traditional construction platform and also the industry lagging behind due to the traditional practices. To advance knowledge on building and construction, students' skills development for employability, this research investigates the relationship between emerging building management skills and employability of graduates. The study also ascertains the effect of graduate personal attributes on the relationship between building management skills and employability of graduates in Akwa Ibom State.

1.1. Objectives of the Study

Given the background above, the specific objectives are to:

i. To establish the relationship between building management skills and employability of building graduates in Akwa Ibom State.

ii. To establish the moderating effect of personal attributes on the relationship between building management skills and employability of building graduates in Akwa Ibom State.

iii. The outcome of the study is essential to ascertaining how the personal characteristics of graduates could influence their skills acquisition and employability. It would also reveal the areas of need in terms of emerging building management skills that building graduates need for ease of school-to-work transition.

1.2. Research Hypotheses

The following null hypotheses are stated to guide the study.

i. There is no significant relationship between building management skills and employability of building graduates in Akwa Ibom State.

ii. There is no significant moderating effect of personal attributes on the relationship between building management skills and employability of building graduates.

2. LITERATURE REVIEW

2.1. Personal Attributes of Building Graduates

Central to skills acquisition and utilization are personal variables. Students learn skills at different rates, workers apply same skills at different levels of complexity and also respond to work challenge using personal skills and attributes. Personal attributes are often referred to as generic skills. Caleb and Udofia (2013) defined generic skills as key personal competencies that can be used across a large number of different occupations and they provide a platform for the development of employability skills needed by young people and adults. Generic skills involve little or no interaction with machines, but help individuals maintain positive social relationships and contribute to the work environment. Key personal skills according to Schenk (2016) include communication and interpersonal skills, problem solving skills, initiative taking, and being self-management skills, professionalism, working under pressure and to deadlines, organizational skills, team working, ability to learn and adapt, using mathematical ideas and techniques, using technology, valuing diversity and difference and negotiation skills. These skills are independent of sector, underpin technical skills and draw on personal attributes. However, the extent by which these skills need to be possessed varies from one occupational grouping to another.

2.2. Emerging Construction Technologies driving New Building Management Skills

The appeal of new construction technology lies in its promise and capacity to allow companies to build faster and smarter. That is, be more efficient and competitive. The latest inventions often go beyond that to be more environmentally friendly, house people in innovative ways, pave roads with advanced materials, and operate with greater efficiency. Today, there are numerous examples of how new technology is revolutionizing the construction sector. Georgiou (2022) enumerated several technologies reshaping the building industry and driving the need for new building management skills. These includes Building Information Modelling (BIM), modular construction, geospatial technologies, wearable technologies, Intelligent building management systems (IBMS), Revit, green building technology, modular building construction technology, Sustainable building production and offsite building technology among others.

2.3. Employability and Employability Skills

Graduate employability refers to a person's ability to find and obtain employment upon graduation. Employability is presented as a graduate's ability to start working as a competent professional employee. There are several working definitions of employability. The Department of Higher and Further Education, Training and Employment (DHFETE) (2002) defined employability as the capability to move into and within labour markets and to realise potential through sustainable and accessible employment. Bennett (2020) defined employability as the ability to find, generate, and maintain meaningful work across lengthening working lives and multiple work settings. Therefore, for graduates to become employable, they need to possess the certain relevant attributes which in this context are referred to as employability skills. Embedding these skills as part of the curriculum is expected to greatly facilitate the process of transition from education to employment (Kornelakis and Petrakaki, 2020). Employability skills as defined by the Yorke (2006) consist of a set of achievements—skills, understanding, and personal attribute that a graduate should possess—that can make them more likely to be successful and sustainable in their chosen occupation, for their benefit, the workforce, the community, and the economy at large.

A study by Small *et al*. (2018) highlights that the identification and understanding of workplace-demanded employability skills could improve the chances of graduates to gain employment. These skills as posited by McGrath (2009) are associated with the knowledge of the task, hands-on ability, and a combination of intellect, personal, and interpersonal attributes. A study by Archer and Davison (2008), considering the perspectives of employers on graduate employability, provides a contrast between what some universities are promoting and what is required by industry. Employers were in agreement about what were considered to be the most important skills that they look for in graduates.

2.4. Emerging Building Management Skills in the Construction and Building Industry

The building construction and management skills focuses on the underpinning industry practices and construction processes required to create, maintain and repair the built environment. Attributes that building and construction graduates should possess consist of qualities, skills and understanding (Bowden, *et al*, 2000).

The task of developing building management skills is exasperated by the adaptation of emerging building technologies that broadens the skill requirements for carrying out building management. From of-site construction, building information management (BIM), smart buildings, environmental friendly buildings, augmented realities, artificial intelligence and unitized building system (Modular buildings), the technologies behind these buildings require higher order skills from building technology graduates. It is quite essential to note that whether residential or commercial buildings, the building management skills demand are the same (Dallasega, *et al*, 2018). The emerging technologies are also creating sub occupations and placing greater demand on information management skills, process management skills and relationship management skills.

2.5. Empirical Review

Orando and Isabirye (2018) examined construction workers' skill development: a strategy for improving capacity and productivity in south Africa. A descriptive research methodology using emailed questionnaires to collect data was used. Collected data was analysed using two statistical methods. The first method used the mean values to establish data acceptance and the second, the relative importance index, was used to grade the data. Twenty-three factors, narrowed down to six main behaviours were found to be significant in influencing construction workers' capacity to improve productivity. The six behaviours

included educational backgrounds, attitude towards own skills development, working conditions, the organisation's role in enhancing employee capacity and goal setting.

Khodeir and Nessim (2019) examined changing skills for architecture students' employability: Analysis of job market versus architecture education in Egypt. A literature review was performed. Afterwards, a questionnaire targeting a sample of 100 fresh-graduates' and senior students was carried out and aimed at identifying the current challenges facing the integration of the required skills. A 360 degrees' evaluation was performed to assess the students' views. In addition, fifteen one-to-one interviews were done with professionals and academics to identify the Architecture, Engineering and Construction market needs. It was found from the analysis of the questionnaire that some skills were acquired through most courses offered in undergraduate architectural studies. Based on the participants' perspective, these include problem solving, decision making, innovation, and creativity.

Obi, *et al* (2020) investigated total interpretive structural modelling of graduate employability skills for the built environment (BE) sector. The study aimed to analyse the key skills influencing BE graduate employability in the United Kingdom (UK) for the benefit of higher education institutions (HEIs). The study adopted a qualitative approach towards understanding the salient employability skills for BE graduates from the perspectives of various key stakeholders. Participants were selected based on their educational/professional background, experience, expertise in BE disciplines, and involvement in the recruitment processes of graduates in the BE sector both in industry and academia within structured environments. The researchers compiled a list of the variables identified from the literature and presented it in a two-phased, brainstorming session comprising of 4 distinct rounds. The discussions were carried out to reach an agreement of the key employability skills relevant to the BE settings. This investigation leverages on a critical review of extant literature and an elicitation of the perceptions of targeted macro, meso, and micro level key stakeholders in the BE sector to identify key employability skills. The Total Interpretive Structural Modelling (TISM) technique was used to analyse the contextual interrelationships among the identified skills to develop a hierarchical model that provides HEI with insight for BE curriculum development. Six key employability skillsets hierarchically modelled into four levels were identified as crucial for potential graduates to successfully attract and adapt to contemporary practices in the Built Environment sector. Findings revealed communication and team-working skills as critical, independent skills driving the successful development of the remaining four skillsets. This research extends the literature on employability skills by investigating the interactions of various stakeholders (architects, engineers, among others) in the built environment.

The reviewed empirical studies has methodologies adopted by the present studies. However, the combination of personal attributes and the use of structural equation modelling to check for effect is one area yet to be explored.

2.6. Area of the Study

The study area is Akwa Ibom State in the South-South Geopolitical zone of Nigeria. Akwa Ibom covers a land mass of about 6,900 square kilometres, with a population of over 6 million people. It is located between latitudes 4^{o} 32' and 5^{0} 33' north and longitude 7^{0} 25' and 8^{0} 25'. The state has 31 local government areas. It is bounded on the north by Abia State, on the east by Cross River State, on the south by the Bight of Bonny and on the west by Rivers State (Akwa Ibom State Ministry of Information, 2011). Major urban centres include Uyo, Eket, Ikot Ekepene and Abak. Major ethnic groups in Akwa Ibom are Ibibio, Anang, Oron, Eket and Mbo. The State has a lot of natural resources such as arable lands, solid minerals, oil and gas. Natural resources spur growth and encourage development as the inhabitants take to different occupations. Akwa Ibom State has become a preferred destination for real estate developers. The State also has teriary institutions that train building technology graduates. This includes University of Uyo,

Akwa Ibom State, University, Akwa Ibom State Polytechnic, Ikot Osurua, Heritage Polytechnic and Ibom Metropolitan Polytechnic. As the economy of the State grows, the middle class is also growing, prompting individuals to opt for building their own houses. The building and construction industry in the State is experiencing a boom. However, such a boom should translate to more economic activities for building graduates in the State. This informed the choice of this State to ascertain whether the building technology graduates, are employable.

3. METHODOLOGY

This study adopted the descriptive survey design. The population for the study is 707 respondents, comprising 70 building lecturers in tertiary institutions in Akwa Ibom State and 63 building executives and 574 Building technology graduates from tertiary institutions in Akwa Ibom State. The sample size is 213 respondents, comprising 21 lecturers, 19 experts from industries and 173 building technology graduates. Multistage sampling was utilized for the study. Simple random sampling was used to select the industry experts for the study while accidental sampling was employed to sample the building graduates for the study. The researchers' developed instruments titled "Emerging Building Management and Employability Skills Questionnaire (EBMESQ)" and "Building Graduates Personal Attributes Questionnaire (BDGPAQ)" were used for data collection. The developed instruments were face validated by three experts in the Department of Building, University of Uyo, Uyo. The instruments were subjected to a test-retest method to determine the reliability. The instruments were trial tested on 40 respondents. The scores obtained from the trial-test were subjected to Cronbach alpha method. This gave values of 0.88 and 0.83 respectively for EBMESQ and BDGPAQ. The data generated was analysed using multiple regression analysis to answer research question 1 and to test hypothesis 1, while structural equation modelling (SEM) was used to answer research answer research question 2 and to test hypothesis 2 at .05 alpha level.

Data for the study was collected using questionnaires. Personal attributes were measured using a personality scale, multiple regression analysis was used to establish the relationship between building management skills and employability of building graduates, and structural equation modelling (SEM) was applied to establish the moderating effect of personal attributes on the relationship between building management skills and employability of building graduates.

4. PRESENTATIONAND DISCUSSION OF RESULTS

4.1. Presentation of results

Research Question 1: What is the relationship between building management skills and employability of building graduates in Akwa Ibom State?

Table 1: Summary of Multiple Regression Analysis of Relationship between Building Management Skills and Employability

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.055[a]	.003	-.003	.64384

a. Predictors: (Constant), BMS

Table 1 gives the multiple regression model summary of the relationship between building management skills and employability of building graduates. The result shows a correlation index is .055, indicating a very weak positive relationship between building management skills and employability. The coefficient of determination R^2 is .003. This shows that only 0.3% changes in employability of building graduates is as a result of the emerging building management skills.

Research Question 2: What is the moderating effect of personal attributes on the relationship between building management skills and employability of building graduates?

Table 2: Summary of Structural equation modelling of moderating effect of personal attributes on the relationship between building management skills and employability of building graduates

Variances:

	Estimate	Std.Err	z-value	P(>|z|)	Std.lv	Std.all
.SMS	1.285	0.182	7.069	0.000	1.285	0.967
.CREA	0.139	0.086	1.606	0.108	0.139	0.016
.PROF	0.253	0.086	2.959	0.003	0.253	0.030
.PHYS	12.645	1.807	6.999	0.000	12.645	0.501
.PBS	3.418	0.506	6.750	0.000	3.418	0.195
.COG	1.219	0.172	7.070	0.000	1.219	0.984
.EMPLOY	5.754	0.814	7.071	0.000	5.754	1.000
.BMS	7.715	1.094	7.055	0.000	7.715	0.788
.Pers_ATT	0.044	0.048	0.914	0.361	0.988	0.988

Table 2 presents the summary of the structural equation modeling (SEM) analysis using rstudio. In considering the moderating effect of personal attributes on the relationship between building management skills and employability, the result shows a coefficient of 1.285 for self-management. This indicates that a unit increase in building management skills results in a 1.285 unit increase in employability of building graduates indirectly through its effect on self-management. Thus, self-management has a positive moderating effect on the relationship between building management skills and employability of building graduates. The standardized indirect effect (Std.all) is 0.98, which indicates a very high positive relationship.

For creativity, the coefficient is .139, indicating a low moderating positive effect of creativity on the relationship between building management skills (BMS) and employability (EMPLY) of building graduates. The result also shows a standardized indirect effect (Std.all) of 0.02 for creativity, indicating a very low relationship between creativity and employability of building graduates.

For the personal attribute of professionalism, the coefficient is .253, indicating a low moderating positive effect of professionalism on the relationship between building management skills (BMS) and employability (EMPLY) of building graduates. The result also shows a standardized indirect effect (Std.all) of 0.03 for professionalism, indicating a very low relationship between professionalism and employability of building graduates. Physical dexterity has a coefficient of 12.645, indicating a very high positive moderating effect of physical dexterity on the relationship BMS and EMPLY. Problem solving and cognition skills have coefficients 3.418 and 1.219 respectively, indicating positive moderating effects on building management skills (BMS) and employability (EMPLY).

Ho_1: There is no significant relationship between building management skills and employability of building graduates in Akwa Ibom State.

Table 4.3 presents the summary of the regression analysis. The result shows linear low positive increase in employability as the building management skills of graduates increases. Every unit rise in building management skills of graduates leads to an increase of .063 in employability skills. The result however, shows a probability value of .478, indicating it is not significant. Thus, there is no significant relationship between building management skills and employability of building graduates in Akwa Ibom State.

Table 4.3: Summary of regression analysis on significant relationship between building management skills and employability of building graduates in Akwa Ibom State.

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.942	.390		10.101	.000
	BMS	.063	.088	.055	.711	.478

a. Dependent Variable: EMPLY1

*Significant at p>05.478

Ho2: There is no significant moderating effect of personal attributes on the relationship between building management skills and employability of building graduates.

Table 4.4: Summary of Multiple Regression Test for significant moderating effect of personal attributes on the relationship between building management skills and employability of building graduates

Latent Variables:

Regressions:

	Estimate	Std.Err	z-value	P(>|z|)	Std.lv	Std.all
Pers_ATT ~						
BMS (a)	0.001	0.007	0.162	0.872	0.005	0.016
EMPLOY(a)	0.001	0.007	0.162	0.872	0.005	0.012
EMPLOY ~						
Pers_ATT (a)	0.001	0.007	0.162	0.872	0.000	0.000
BMS ~						
EMPLOY (c)	0.313	0.116	2.699	0.007	0.313	0.240
Pers_ATT (b)	5.597	3.502	1.598	0.110	1.179	0.377

Defined Parameters:

	Estimate	Std.Err	z-value	P(>|z|)	Std.lv	Std.all
indirect	0.006	0.036	0.168	0.867	0.006	0.006
total	0.319	0.122	2.621	0.009	0.319	0.246

*Not Significant at p>.05

Table 4.4 presents the summary of the multiple regression analysis. The result shows that the indirect effect, that is, the moderated effect has a coefficient of .006 and a probability value of .867. This indicates that it is not significant. Thus, there is no significant moderating effect of personal attributes on the relationship between building management skills and employability of building graduates.

4.2. Discussion of Results

Relationship between Building Management Skills and Employability of Building Graduates

Findings from the analysis of the related research question reveals that a correlation index of .055, indicating a very weak positive relationship between building management skills and employability. The coefficient of determination R^2 is .003, indicating that only 3% changes in employability of building graduates is as result of the emerging building management skills.

When the building management skills were assessed independently, it was found that some were positive while others had negative correlations. This corroborates the findings that there is a low positive relationship between building management skills and employability of graduates. The hypothesis test confirms that there is no significant

relationship between building management skills and employability of building graduates in Akwa Ibom State. This finding is in agreement with Orando and Isabirye (2018) who examined construction workers' skill development as a strategy for improving capacity and productivity in South Africa. Twenty-three factors, narrowed down to six main behaviours were found to be significant in influencing construction workers' capacity to improve productivity.

Moderating Effect of Personal Attributes on the Relationship between Building Management Skills and Employability of Building Graduates

The analysis of the moderating effect of personal attributes on the relationship between building management skills and employability reveals a coefficient of 1.285 for self-management. This indicates that a unit increase in building management skills results in a 1.285 unit increase in employability of building graduates indirectly through its effect on self-management. For professionalism, the coefficient is .139, indicating a low moderating positive effect of creativity on the relationship between building management skills (BMS) and employability (EMPLY) of building graduates. For the personal attribute of creativity, the coefficient is .253, indicating a low moderating positive effect of professionalism on the relationship between building management skills (BMS) and employability (EMPLY) of building graduates. The overall model has a coefficient of 0.006 and a correlation index of 0.006. This indicates a low positive moderating effect of personal attributes of graduates on the relationship between emerging building management skills and employability of graduates. The corresponding hypothesis test confirms that there is no significant moderating effect of personal attributes on the relationship between building management skills and employability of building graduates. While attributes are personal, they give an indication of attitudes of individuals towards a task, skills and occupation. Where graduates have negative attitudes towards new skills, they will most likely not develop skills in that area. In the building industry for instance, this might lead to broadening the skills gap. This finding is corroborated by Juan Rodrigo and del Villar (2018) who researched on self-management and employability skills of hospitality management students. The general findings on the students' moderate competence on their self-management skills and employability skills were quite alarming considering that those data were taken from graduating students.

This finding is supported by Khodeir and Nessim (2019) who found that some skills were not acquired at all through the undergraduate courses, these skills, in turn require most attention, these include problem solving, cognition skills and self-management skills.

5. CONCLUSION AND RECOMMENDATIONS

5.1. Conclusion

Based on the findings of the study, it is concluded that building management skills has a low positive but not significant relationship with employability skills of building graduates. The study concludes that building graduates lack emerging building management skills that will enhance their employability. The outcome of the study establishes no significant moderating effect of personal attributes on the relationship between building management skills and employability of building graduates. Thus, building graduates in addition to not possessing building management skills, lack positive personal attributes essential for employability and skills development.

5.2. Recommendations

Based on the findings of the study, the following recommendations are made.

i. The essence of personal development should be made clear to students. As such, there should be a concerted effort by school authorities to ensure that professional

development courses should include a unit of instruction devoted to personal development of building students.

ii. Tertiary institutions should establish industry-academia partnerships that allows for fruitful exchanges, supporting skills development, curriculum innovation and future mapping.

iii. Emerging building management skills such as BIM capabilities, Modular building construction techniques, Revit, intelligent building management system, green building technology and geospatial technology application skills should be taught to students to help them enhance their employability.

6. Limitation Of The Study

There are several limitations that this study may likely encounter. Data for the study were collected from graduates who were at different locations within and outside the state even though they graduated from institutions within the State. It is also possible some of them may not even be in the building profession, as such, some of their responses may not be in line with the objectives of the study, thereby, affecting the generalizability of the findings.

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