

# Determinants of Application of Research Methodologies in Architecture Programs in Covenant University, Ota, Nigeria

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**Abstract:** Research methodologies (R.Ms) employed in carrying out studies have been found in diverse contexts to influence the outcome. This study examined the determinants of applications of R.Ms in undergraduate and postgraduate studies in Department of Architecture Covenant University Ota, Nigeria. The objectives include analysis of the identified R.Ms attributes and identification of the factors influencing applications of the R.Ms employed in architecture research programs (B.Sc., M.Sc., and M.Phil./Ph.D Degrees) in the University. The methodology adopted for the work is the cross-sectional survey of the 153 final year B.Sc., the M.Sc., and the Ph.D Students using 5-point Likert Scale questionnaire as data collection instruments; and interview of 16 of the students across the levels. Data obtained from the survey; and interview of the students were subjected to descriptive statistics (percentages and frequencies) and inferential statistics (Kruskal-Wallis Test, Linear multiple regression and Cross-tabulation). The results showed that Level/Program (.428), Rating of appropriateness of methodology for current or terminal research (.046), Gender (.044), Type of terminal research (.040), Distance of Residence to Department (.023), are the principal five (5) of the 13 predictors of the dependent variable in the study (representing 72.99% of total contribution to the model with R Square of .796). The study recommended commencement of 'research methodology course' which used to be in 400 Level Alpha to be moved from 300 Level Omega to 200 Level Alpha and Omega for early higher mastery, and for supervisors to consciously ensure more applications of R.Ms at undergraduate level beginning from 200 Level. Also female students are to apply quantitative RM more than their usual practice even from early part of undergraduate level.

**Keywords:** Epistemology, ontology, paradigm, predictors, research methods.

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## Revised Manuscript Received on February 2, 2020.

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## I. INTRODUCTION

Research methodologies have come a long way. The depth of understanding and mastery of the R.Ms determine the potentiality for successful conduct of researches. Carrying out a study with fieldwork is one aspect, while other aspects include analysis, complete report of findings, and dissemination of findings in approved or standard publication outlet. The impact of the R.Ms can be assessed by using the rate of publication(s) or number of publication(s) within certain duration. Covenant University is a leading private Christian university in Nigeria, affiliated with Living Faith Church Worldwide. It is globally ranked within top 2170 in the world [1] [2], one of top 10 of the 143 universities (made up of 40 Federal, 42 State and 61 Private) and top private university in Nigeria [3]. The Nigeria's ranks have been for many years. Established on 21<sup>st</sup> October 2002, it has been working with a vision to be among top 10 universities in the world by the year 2022 since year 2012 when the university celebrated her tenth year anniversary. Every discipline or course has its peculiarity and therefore inclinations. It is in line with this university's global vision that Architecture department is seeking to be one with a group of most published 'faculty and students' globally, that this study is being undertaken to find ways to improve quality and increase quantity of their publications on continuous basis.

Every system or organization seeks improvement in diverse ways depending on the products and identified deficiencies. The department is seeking ways to be one of the most published globally; hence, understanding how to achieve continuous improvement is crucial. The architecture research programs (split into undergraduate and postgraduate studies) are made up of Bachelor of Science (B.Sc.) Degree, Master of Science (M.Sc.) Degree, and Master of Philosophy (M.Phil.)/Doctor of Philosophy (Ph.D) Degree. This study investigated the determinants of applications of R.Ms in Architecture programs in Covenant University Ota, Nigeria with a view to identifying ways to enhance publication outputs. The objectives are to: (i) examine the socio-demographic characteristics of the respondents (ii) analyze the R.Ms attributes (iii) establish relationship between Application of the Research Methods and the Levels/Programs (iv) identify the factors influencing applications of the methodologies in architecture research programs in Covenant University.

The need to identify the various factors influencing application of R.Ms and publication outputs and understand the dynamics of their combinations; which have been rarely investigated, makes this study timely based on the

university's running vision and vital for filling the gap in literature and knowledge. Also there is the need to provide the departmental management adequate information on the subject based on the research outcome, which should be useful to the department in taking steps on how to increase research applications and publications from the department from 'students and faculty'; the outcome will also serve as reference for future researches on this subject, as the study can be replicated using different methods and in different context (nationally, in other nations or internationally). Though the Architecture is one of the pioneer departments since 2002, the study scope covers the Undergraduate (400 Level) and Postgraduate (Masters Class and Ph.D Level) in 2017/2018 session. An increasing number of architectural faculty have in the last over 40 years chosen research and scholarship, instead of practice, as their academic mission [4]. Also a great number started their career with professional practice for many years but ended with research and scholarship hence the need to prepare students for the future challenges. Compared to many other disciplines and professional fields, Architecture covers wider foci and methodological choices need to be well considered. However, every research specialty must be situated within spectrum of the particular or relevant discipline [4]. Architectural research is generally associated with practice, but research in architecture programs encompasses more than practice, which calls for deeper understanding of research methodologies generally, to be able to fashion out appropriate R.Ms. for any study being undertaken.

## II. THEORY, CALCULATION AND METHODOLOGY

### A. Theory

The review of literature focused on research, paradigms/philosophy, Logic, model classifications, generalizations, and determinants, which are considered vital to the subject of study.

Research a formal systematic activity for discovery and development of organized body of knowledge. Such includes finding out relationships or otherwise among variables, the conditions under which a phenomenon cannot or can occur [5] [6] [7]. Research is also considered as problem solving activity leading to new knowledge using established methods of enquiry. Research is conducted for exploring, probing an issue, solving problems, and making statements compelling us to search for solution elsewhere. It may involve going beyond our opinions, feelings, thoughts, and personal experience [8].

In any study the research paradigm (philosophy or model) must be clearly defined. It generally focuses on discovery of generalizations or answers to research questions relating to diverse aspects of any field, enabling decisions on what to do, how to do them and what to be avoided in a process or system for a particular result or otherwise. Research methodology, however is an organized body of knowledge for conducting research on the basis of philosophy (love of wisdom), which focuses on analytical speculative study of reality and the nature of man. Philosophy is interested in searching for wisdom or truth for explanation or interpretation of events or phenomenon. In this search for truth, it makes available valid methods and comprehensive understanding of reality, which also requires

analytical, meticulous careful consideration and perception of phenomenon.

It was asserted by [5] that logic as science of exact thought belongs to the fields of philosophy and uses major instruments such as induction, deduction, syllogism, and experimental reasoning also known as problem-solving. The basis of deductive reasoning is termed syllogism which consists of premises (major and minor), and conclusion of the argument in the third statement. Syllogism is also classified into hypothetical, categorical and alternative. Although syllogism encourages bringing out inferences and coming up with deductions about an occurrence of event, it is pertinent to note that deductions do not always produce new knowledge but vital to truth being sought. Inductive reasoning resulted from criticisms against the deductive reasoning. Inductive reasoning can be obtained when a researcher collects data, enabling establishment of generalizations as likely true by observing particular instances, from which general conclusion about the group or population is made. Problem solving as a form of reasoning is mainly inductive, though can also make use of deduction, beginning with a problem, observes all data, relating to the problem, formulate hypotheses, and test them at reaching workable solution to the identified problems.

Two different models or paradigms identified, 'positivism/post-positivism' and 'Interpretivism/interactionism' commonly underpinning quantitative and qualitative research respectively were exhaustively discussed by [9] [10]. According to them Positivists believed social forces beyond peoples' control determines their behavior and sociologically, measure the behaviors and relationship between the factors allowing them to work using quantitative data and statistics respectively. They generally make use of questionnaires and structured interviews, as they both yield quantitative data which are reliable and objective. Positivism is based on many principles such as, believe in objective reality. Phenomena are subject to natural laws discoverable in logical ways through empirical testing, by means of deductive and inductive reasoning based on established scientific theory. Generally, uses quantitative measures and establishes relationships among variables [11]. Interpretivists (interactionists) on the other hand, as asserted by [9] [10], use empathy to understand human behavior; they use methods which enable them unravel meanings and reasons behind human behavior. They believed that meanings and opinions cannot be turned to statistical charts as positivists normally do, because sociology is not scientific. Hence they use techniques to produce qualitative data such as participant observation and unstructured interviews. Interpretivism according to [11] is a paradigm that came up in social sciences emancipated from the constraints of positivism. It uses qualitative methodological approaches such as ethnography and phenomenology, characterized by subjectively-based reality and retaining ideals of researcher as expert interpreter of data.

(i) Interpretist/Antipositivist/Qualitative-Subjective/Argumentative, Document Reviews, Ethnographic/Case Study [12] [13] with Interviews, Descriptive/Interpretative, Observations/ Non-computational Meta-analysis (ii) Scientific/Positivist/Quantitative- Surveys [14] [15], Case

Study with standard Surveys, May involve Correlation or Regression Analysis/May also be Descriptive (including frequencies and averages)/ Computational Meta-analysis. [4] discussed the following seven types of research methodologies, historical, qualitative, correlational, experimental and quasi-experimental, simulation, logical argumentation, case studies and mixed methods. [16] discussed the research types as ‘experiments’, ‘cross sectional and longitudinal surveys (using questionnaire, interviews, telephone)’, ‘case studies (using various techniques of data collection, including observations and interviews)’, and ‘participant and non-participant observation’; [7] [17] identified them as exploratory, descriptive, conclusive, experimental, survey, case study, co-relational, historical, and evaluation research.

Generalization was described by [18] as an act of reasoning which involves bringing out inferences from particular observations in quantitative research rather than qualitative research where it is controversial. Qualitative research is mainly concerned with provision of rich contextual understanding of certain aspects of human experience by intensive study of specific cases. In situations where evidences for improving practices or phenomena are of high value and knowledge based generalizations claims merits, careful thoughts and actions by both qualitative and quantitative researches are inevitable.

On the determinants of application of research methods in architecture programs, from literature, standard multiple regression (SMREG), which is an extension of correlation is the tool used for exploration of predictive ability of a set of independent variables (i.v.s) on one continuous dependent variable (d.v.); hence identification of the i.v.s [19, 20]. SMREG according to [7] with these types of variables normally leads to generation of models which normally assist managers in managerial decision-making situations in organizations. The model represents the system, and defined as the body of information articulated about and for the system which is stated as a set of variables and their interrelationships. Wrong decision about a model can lead an organization in difficult situation, while right decision can bring such out of difficulty. A cross-tabulation analysis of d.v versus each of the predictors from among the i.v.s will generally yield explanation of their relationships from which decision on how to improve the system deduced.

### B. Calculation and Methodology

The research philosophy is positivism with quantitative as the main approach by means of cross-sectional survey of the 153 final year B.Sc., the M.Sc., and the Ph.D Students using 5-point Likert Scale questionnaire as data collection instruments; and interview of 16 of the students across the levels (Tables B.1 & B.2); with the fieldwork carried out in January 2018. Though based on standard sample size table and formulae, acceptable margin error of .05 and alpha level of .05 for categorical variable [21] [6] [19], a minimum sample size of 110 was calculated, the whole study population (153) considered as small was sampled. The interviewed students represent over ten per cent of the sample size. Data obtained from cross-sectional survey; and interview of the students across the levels were subjected to descriptive statistics (percentages and frequencies) and inferential statistics (Kruskal-Wallis Test, Linear multiple regression and Cross-tabulation). Variables and codes employed in inferential statistics are shown in

Table B.3.

**Table B.1. Study Population and Questionnaires Administration**

	Category	Population	Calculated Sample Size	Actual Sample Size	Returned
1	B.Sc.	52	37	52	52
2	M.Sc.	82	59	82	82
3	M.Phil/Ph.D	19	14	19	12
	Total	153	110	153	146

**Table B.2. Interviewed Students**

	Category	Population	Calculation	Actual Sample Size	Per cent (%)
1	B.Sc.	52	3	5	31.25
2	M.Sc.	82	4	8	50.00
3	M.Phil/Ph.D	19	1	3	18.75
	Total	153	8	16	100.00

## III. RESULTS AND DISCUSSION

### A. Socio-demographic characteristics of the respondents

Results of the study socio-demographic characteristics of the 153 Current students and of the 16 Interviewed Current students (Table A.4 in Appendix A) revealed that most of them were males, of ages Above 20years, who are on their postgraduate program and whose length of architectural training was five (5) to eight (8) years. Majority of them have not less than B.Sc./B.Tech. Certificate as their highest educational qualification, are employed students whose monthly stipend/or income is below ₦ 80,000 Nigerian currency, and living on campus within a distance of 2.0Kilometre to the department.

**Table B.3. Variables and Codes**

SN	Description	Code
	<b>Independent Variables</b>	
1	Gender	GENDER
2	Age of respondent	AGERES
3	Level/Program	LEVEL
4	Cumulative length of stay or training in the Department	LTRAIN
5	Highest Educational Qualification attainment	EDUQL
6	Occupation/Employment status of respondents <sup>2</sup>	OCUPRE
7	Average monthly Stipend/or income classification	INCLAS
8	Distance of Residence to your Department	RESDIST
9	Type of your terminal research	TERMRP
10	Mastery of research methods	MASTRM
11	Rating of knowledge base of research methods	KBSRM
12	Duration since you first became acquainted with research methods	RMADUR
13	Rating of satisfaction with department about guidance on research method for your current or terminal research	SUPVSAT

14	Rating of appropriateness of your methodology for your current or terminal research	RMAPRO
15	Cost of carrying out quantitative compared with qualitative research	QNQLCST
16	Cost of carrying out qualitative compared with quantitative research	QLQNCST
17	Rating of standard of research methods attained by the department	RMSTD
<b>Dependent Variables</b>		
18	Number of application of 'qualitative' as main research method since acquisition of the knowledge including current project(s)	QLRMAP
19	Number of application of 'quantitative' as main research method since acquisition of the knowledge including current project(s)	QNRMAP
20	Number of application of 'research method' since acquisition of the knowledge including current project(s):	RMAPPL

**B. Analysis of the R.Ms attributes**

Results of the study on identified R.Ms attributes (Table B.5 in Appendix B) revealed that most of them are currently conducting Quantitative (Scientific or Positivist) research Type in their final/terminal year, with high levels of Mastery and Knowledge base of R.Ms, with over one year as Duration since first became acquainted with R.Ms. They have high number of Application of qualitative R.Ms compared with lowest class, low number of Application of quantitative R.Ms compared with higher classes, high number of Application of R.Ms compared with lowest class. They rated high their 'Satisfaction with department about guidance on R.M. on current or terminal research projects and Appropriateness of R.M. for current or terminal research'. Majority of the students rated high- the 'Cost of carrying out quantitative compared with qualitative research' and the standard of R.Ms attained by the department, and low- the 'Cost of carrying out qualitative compared with quantitative'.

**C. Relationship between Application of the Research Methods and Levels**

The hypothesis is that there is no significant relationship between application of the R.Ms and the levels/programs. Since the research methods were applied across the three distinct 'Levels/Programs', the relationship of scores on continuous dependent variables for the three groups in the variable 'Levels/Programs' were established by Kruskal-Wallis Tests, with level of significance of less than .05 being accepted as significant, that is, the probability that the result would have occurred by chance is less than five per cent; hence a relationship exists. The continuous variable is 'Application of research methods (R.Ms) since acquired the knowledge including current project(s)'.

**Table C.6. Kruskal-Wallis Test 3a**

Ranks			
	Level/Program	N	Mean Rank
No. of application of research methods since acquisition of the	B.Sc. (400L)	52	37.15
	M.Sc. Class	82	93.65
	M.Phil/Ph.D	12	93.33

knowledge including current projects	Total	146	
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Kruskal-Wallis Test of relationship between application of research methods (RMAPPL) and the levels/programs (Tables C.6-9) revealed a statically significant difference in RMAPPL across the three different 'Levels' in the program (Grp1, n=52:

**Table C.7. Kruskal-Wallis Test 3b**

Test Statistics <sup>a,b</sup>	
	No. of application of research methods since acquisition of the knowledge including current projects
Chi-Square	68.519
Df	2
Asymp. Sig.	.000
a. Kruskal Wallis Test	
b. Grouping Variable: Level/Program	

**Table C.8. Kruskal-Wallis Test 3c**

		Frequencies		
		Level/Program		
		B.Sc. (400L)	M.Sc. Class	M.Phil/Ph.D
No. of application of research methods since acquisition of the knowledge including current projects	> Median	3	28	3
	<= Median	49	54	9

**Table C.9. Kruskal-Wallis Test 3d**

Test Statistics <sup>b</sup>	
	No. of application of research methods since acquisition of the knowledge including current projects
N	146
Median	2.0000
Chi-Square	14.365 <sup>a</sup>
Df	2
Asymp. Sig.	.001
a. 1 cells (16.7%) have expected frequencies less than 5. The minimum expected cell frequency is 2.8.	
b. Grouping Variable: Level/Program	

B.Sc. 400L, Grp2, n=82: M.Sc. Class, Grp3, n=12: M. Phil/Ph.D),  $\chi^2 (2, n = 146) = 68.519, p = .000$ . The M.Sc. Class and B.Sc. (400L) recorded less than or equal to the median score (MD=2). Since the Chi-Square has Asymp. Sig. of .000 which is less than .05 (i.e.,  $p < .05$ ), it established that there is statically significant difference of the scores of the three groups in the categorical variable 'Levels/Programs' on the continuous variable 'RMAPPL'. This implied that the probability that the result would have occurred by chance is less than five (5) per cent; hence a significant relationship exists between them.

**D. Identification of the determinants of Number of Applications of the R.Ms**

Having conducted preliminary analysis to ensure no violation of the assumptions of normality, linearity, multicollinearity and homoscedacity, the independent variables (Table B.3) as found in literature and pilot study on factors capable of influencing applications of the R.Ms in the study area were subjected to standard multiple regression (SMREG) analysis against ‘Number of application of ‘research method’, since acquisition of the knowledge including current project(s)’ as the dependent variable (d.v.). A total of 20 (independent and dependent) variables were involved in the SMREG. It is pertinent to note that even though ‘Number of application of ‘qualitative’ research method’ and ‘Number of application of ‘quantitative research method’ are main contributors to the d.v., they are deliberately excluded from the SMREG to enable determination of other predictors from the remaining 17 regressors. The 17 regressors or independent variables are made up of eight (8) socio-demographic characteristics and nine (9) R.Ms attributes.

The 17 variables were entered on forced entry as independent variables (i.vs) as listed in Table B.3 against ‘Number of application of research methods since acquisition of the knowledge, including current project(s)’ as the dependent variable (d.v.). The SMREG analysis results (Tables D.10 in Appendix C & D.11 in Appendix D), summarised as  $F[(17, 128)=29.367, p=.000]$ ,  $R^2=.796$ . The coefficient of determination R Square ( $R^2$ ) value of .796 indicates that the i.vs collectively explained 79.64 per cent (over 79%) of the residual variation in the d.v. in the study area. Only thirteen (13) of the i.vs (Level/Program, Gender, Rating of appropriateness of methodology for your current or terminal research, Distance of Residence to Department, Type of terminal research, Cost of carrying out qualitative compared with quantitative research, Cost of carrying out quantitative compared with qualitative research, Rating of knowledge base of research methods, Mastery of research methods, Age of respondent, Income Classification, Duration since first became acquainted with research methods, and Rating of satisfaction with department about supervisors’ guidance on research method for current or terminal research) show significant contribution to the residual variation in the d.v., with each having a sig. value of less than .05.

Based on R Square ( $R^2$ ) change, the result (Table D.12 in Appendix E) showed that Level/Program (.428), Gender (.044), Rating of appropriateness of methodology for current or terminal research (.046), Distance of Residence to Department (.023), Type of terminal research (.040), are the principal five (5) of the 13 predictors of the d.v. in the study (representing 72.99% of total contribution to the model with R Square of .796). Others are Cost of carrying out qualitative compared with quantitative research (.022), Cost of carrying out quantitative compared with qualitative research (.026), Rating of knowledge base of research methods (.041), Mastery of research methods (.037), Age of respondent (.020), Income Classification (.024), Duration since first became acquainted with research methods (.015), and Rating of satisfaction with department about supervisors’ guidance on research method for current or terminal research (.021).

For the equation of best regression, the step-wise algorithm was carried out in a way that the i.vs were entered according to their contribution to the model (Tables D.13 in Appendix F). The contribution of each of the predictors was measured by R Square ( $R^2$ ) change value which showed steady increase in coefficient of determination and decrease in standard error of the estimate. The 13 variables in the model are therefore the predictors of ‘RMAPPL’ in the study. The least square algorithm applied to the model is as in equations 1-3 and Table D.14.

$$Y = B_0 + B_1 \text{LEVEL} + B_2 \text{GENDER} + B_3 \text{RMAPRO} + B_4 \text{RESDIST} + B_5 \text{TERMRP} + B_6 \text{QLQNCST} + B_7 \text{QNQLCST} + B_8 \text{KBSRM} + B_9 \text{MASTRM} + B_{10} \text{AGERES} + B_{11} \text{INCLAS} + B_{12} \text{RMADUR} + B_{13} \text{SUPVSAT} + E$$

..... Equation1

(Where Y= dependent variable,  $B_0$  = constant,  $B_1$ .....  $B_{13}$ = regression coefficients of the predictors; E= error component in the model) gives the resultant estimated equation of the model.

$$Y = -2.963 + (.582) * \text{LEVEL} + (.378) * \text{GENDER} + (-.485) * \text{RMAPRO} + (.312) * \text{RESDIST} + (.231) * \text{TERMRP} + (.749) * \text{QLQNCST} + (.494) * \text{QNQLCST} + (.413) * \text{KBSRM} + (-.260) * \text{MASTRM} + (.407) * \text{AGERES} + (-.382) * \text{INCLAS} + (.148) * \text{RMADUR} + (.160) * \text{SUPVSAT} + .596$$

.....Equation2

$$Y = -2.367 + (.582) * \text{LEVEL} + (.378) * \text{GENDER} + (-.485) * \text{RMAPRO} + (.312) * \text{RESDIST} + (.231) * \text{TERMRP} + (.749) * \text{QLQNCST} + (.494) * \text{QNQLCST} + (.413) * \text{KBSRM} + (-.260) * \text{MASTRM} + (.407) * \text{AGERES} + (-.382) * \text{INCLAS} + (.148) * \text{RMADUR} + (.160) * \text{SUPVSAT}$$

.....Equation3

**Table D.14. The Model and the Components**

Variable $V_1$ ..... $V_{13}$	Regression Coefficient $B_1$ ..... $B_{13}$	Variable Code	Product of Regression Coefficient and Variable
$V_1$	.582	LEVEL	(.582) * LEVEL
$V_2$	.378	GENDER	(.378) * GENDER
$V_3$	-.485	RMAPRO	(-.485) * RMAPRO
$V_4$	.312	RESDIST	(.312) * RESDIST
$V_5$	.231	TERMRP	(.231) * TERMRP
$V_6$	.749	QLQNCST	(.749) * QLQNCST
$V_7$	.494	QNQLCST	(.494) * QNQLCST
$V_8$	.413	KBSRM	(.413) * KBSRM
$V_9$	-.260	MASTRM	(-.260) * MASTRM
$V_{10}$	.407	AGERES	(.407) * AGERES
$V_{11}$	-.382	INCLAS	(-.382) * INCLAS
$V_{12}$	.148	RMADUR	(.148) * RMADUR
$V_{13}$	.160	SUPVSAT	(.160) * SUPVSAT
DV	Y, [Where, Y= dependent variable (DV), Model Constant ( $B_0$ ) = -2.963 and Error Component in the Model (E) = + .596]		

The unique contribution of each of the predictors based on Standardized Beta Coefficients are Level/Program (.354), Gender (.237), Rating of appropriateness of methodology for current or terminal research (-.401), Distance of Residence to Department (.262), Type of terminal research (.146), Cost of carrying out qualitative compared with quantitative research (.261), Cost of carrying



out quantitative compared with qualitative research (.304), Rating of knowledge base of research methods (.456), Mastery of research methods (-.303), Age of respondent (.343), Income Classification (-.257), Duration since first became acquainted with research methods (.265), and Rating of satisfaction with department about supervisors' guidance on research method for current or terminal research (.201).

### **E. Findings**

Based on R Square (R<sup>2</sup>) change in the model, the result showed that in the SMREG involving Number of application of 'research methods (R.Ms)' since acquisition of the knowledge (RMAPPL): has Level/Program (.428), Gender (.044), Rating of appropriateness of methodology for your current or terminal research (.046), Distance of Residence to Department (.023), Type of terminal research (.040), as the principal five (5) of the 13 predictors of the d.v. in the study (representing 72.99% of total contribution to the model with R Square of .796).

#### **Relationship between the main Determinants and the Dependent Variable**

To establish the relationship between the main determinants and the dependent variable, cross-tabulation analyses (not shown) were carried out with summary of the outcomes as follows:

##### **Number of application of 'research methods (RMAPPL):**

###### **(i). Number of application of 'research methods' and Level/Program:**

On Number of application of 'research method', 4Times & Below, 5-8 Times, and 9 Times & Above, the proportions of postgraduate students are 21%, 100% and 91% respectively for each category, while that of undergraduate students are 79%, 0% and 9%. The postgraduate students have higher Number of application of 'research method' than the undergraduate. On the overall, more of the postgraduate students have higher Number of application of 'research method' 5Times & Above (55%) than undergraduate students (2%). This is against the lowest class of applications where the postgraduate students have 9% and undergraduate students have 34%. The higher 'Number of application (5Times & Above) are positively associated with postgraduate students'. The Kendal tau has a sig. of .000 and Spearman correlation has a sig. of .000 which are both less than .05; hence the relationship is significant.

###### **(ii). Number of application of 'research methods' and Gender:**

On Number of application of 'research method', 4Times & Below, 5-8 Times, and 9 Times & Above, the proportions of male students are 50%, 50% and 85% respectively for each category, while that of female students are 50%, 50% and 15%. The male students have higher Number of application of 'research method' than the females. On the overall, more of the male students have higher Number of application of 'research methods' (37%) than female students (21%). This is against the lowest class of applications where they were equal; the male students have 21% and female students have

21%. The higher 'Number of application (5Times & Above) are positively associated with male students'. The Kendal tau has a sig. of .002 and Spearman correlation has a sig. of .004 which are both less than .05; hence the relationship is significant.

###### **(iii). Number of application of 'research method' and Rating of appropriateness of methodology for current or terminal research:**

On Number of application of 'research method', 4Times & Below, 5-8 Times, and 9 Times & Above, the lower appropriateness of methodology for current or terminal research (1-4) are 0%, 0% and 12% respectively for each category, while that of higher appropriateness of methodology for current or terminal research (5-10) are 100%, 100% and 88%. The 'higher appropriateness (5-10)' has higher proportion of those who applied the 'research method' (88%) than 'lower appropriateness (1-4)' with 12%. On the overall, higher 'appropriateness (5-10)' has higher proportion of high class application (5 Times & Above) of 'research method' (54%) than 'lower appropriateness (1-4)' with only 3%. Higher 'Number of application (5Times & Above) are positively associated with 'higher appropriateness (5-10)'. Pearson's R has a sig. of .000 which is less than .05; hence the relationship is significant.

###### **(iv). Number of application of 'research methods' and Distance of Residence to Department:**

On Number of application of 'research method', 4Times & Below, 5-8 Times, and 9 Times & Above, the proportions of students whose Distance of Residence to Department are Above 4.0Km are 0%, 26% and 3%, respectively for each category, while those with shorter Distance of Residence of 4.0Km & Below are 100%, 74% and 97%. On the overall, students with shorter Distance of Residence of 4.0Km & Below' have higher Number of application of 'research methods' (47%) than those with Above 4.0Km with only 10%. The higher 'Number of application (5Times & Above) are positively associated with shorter 'Distance of Residence of 4.0Km & Below'. The Pearson's R has a sig. of .019 which is less than .05; hence the relationship is significant.

###### **(v). Number of application of 'research methods' and Type of Terminal Research:**

On Number of application of 'research method', 4Times & Below, 5-8 Times, and 9 Times & Above, the proportions of Qualitative research type are 40%, 52% and 47% respectively for each category, while that of Quantitative research type are 60%, 48% and 53%. The Qualitative research type has lower Number of application' than the Quantitative research type. On the overall, more of the 'Qualitative research type' marginally has higher Number of application of 'research method' (29%) than 'Quantitative research type' with 28%. This is against the lowest class of applications where 'Quantitative research type' was 26% and 'Qualitative research type' was 17%. The 'Number of application (5Times & Above) are only marginally associated with 'Qualitative research type'. The Kendal tau has a sig. of .373 and Spearman correlation has a sig. of .379 which are both greater than .05; hence the relationship is insignificant when only the two of them are considered, but becomes significant when together with all the other

predictors as deduced from the stepped SMREG.

#### **Findings from interview on factors capability of increasing number of application of R.Ms:**

Most of the respondents opined that the following eight factors - Ethical Issues (informed consent, ensured confidentiality, freedom of expression or response); Low Intelligence Quotient; Time available for researches (short-maximum 12months); Low cost availability for Quantitative researches; Large sample size requirements; Suitability of R.M.; Number of publications from Interpretist Approaches; and Ease of publishing from Positivist Approaches were least ranked (1) on a three point Likert scale; while Age of respondent; and Introversion; were middle ranked(2).

However, these 22 factors- Gender; Level/Program; Cumulative length of stay or training in the Department; Highest educational qualification held by respondent; Average monthly Stipend/or income; Personality traits (including openness, conscientiousness, extraversion, agreeableness, neuroticism, etc.); High Intelligence Quotient; Ease of publishing from Interpretist Approaches; Number of publications from Positivist Approaches; Depth of understanding of R.Ms; Theories and applications (including capability, mastery, etc.); Duration since first acquainted with R.Ms; Number of application of 'qualitative' as main research method; Number of application of 'quantitative' as main research method; Time available for researches (Longer- Over12months); Low cost availability for Qualitative researches; High cost availability for Qualitative researches; High cost availability for Quantitative researches; Knowledge of field of investigation; Researchers' interest; Availability of existing data such as national census, that can be used for analyses; and Small sample size requirements were ranked highest (3) on a three point Likert scale.

On how improvement in quality of research outputs can be achieved, majority opined that 'number of publications' being fairly related to 'number of applications' wants more stringent supervision of articles for publication by the supervisors by operating a system where supervisee and supervisors work together in a closer relationship on research projects. Others who felt that 'number of publications' may not be related to 'number of applications' want thorough work on pre-fieldwork stage by students and supervisors and by being meticulous throughout a research project life.

By extension faculty members are to work harder on research publications so that collectively enhanced quality and quantity can be achieved by the department; which will be contributory to the university goal.

## **IV. CONCLUSION AND FUTURE SCOPE**

### **A. Conclusion**

Socio-demographic characteristics of the study population revealed that most of them were males, of ages Above 20years, who are on their postgraduate program and whose length of architectural training was five (5) to eight (8) years.

Results of the study on identified R.Ms attributes revealed that most of them are currently conducting Quantitative (Scientific or Positivist) research Type in their final/terminal year, with high levels of Mastery and Knowledge base of R.Ms, with over one year as Duration since first became acquainted with R.Ms.

Relationship between Application of the Research Methods (RMAPPL) and Levels revealed a statically significant difference in RMAPPL across the three different 'Levels' in the program.

From standard multiple regression (SMREG) analysis, based on R Square (R<sup>2</sup>) change, the study found that Level/Program (.428), Gender (.044), Rating of appropriateness of methodology for current or terminal research (.046), Distance of Residence to Department (.023), Type of terminal research (.040), are the principal five (5) of the 13 predictors of the d.v. in the study (representing 72.99% of total contribution to the model with R Square of .796).

The study recommended commencement of 'research methodology course' which used to be in 400Level Alpha to be moved from 300Level Omega to 200Level Alpha and Omega for early higher mastery, and for supervisors to consciously ensure more applications of RMs at undergraduate level beginning from 200Level. Also female students are to apply quantitative RM more than their usual practice even from early part of undergraduate level. More guidance by supervisors is required to enhance appropriateness of R.Ms for projects; and all postgraduate (just as undergraduate) students as far as possible should be encouraged to live on the campus which is considered close to the department, for its positive impact of increasing number and rate of applications of R.Ms with very high proportion of them culminating in standard publication.

### **B. Future Scope**

The future scope of similar study can be enlarged to include all accredited approved universities in the country offering architecture program. There are federal government owned, state government and private owned universities accredited by both the Nigerian Universities Commission (NUC) and Architects Registration Council of Nigeria (ARCON). Such study can enable comparison to be made between the universities in addition to overall for all the universities.

## **ACKNOWLEDGEMENTS**

We hereby wish to express our appreciation to Covenant University for enabling environment and financial support. In addition to the references, the authors wish to appreciate every other participants in the study, researchers and authors of books and other sources of secondary information that served as referrals for this work.

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**APPENDICES**

**Appendix A**

**Table A.4. Socio-demographic Characteristics of Respondents**

Socio-demographic characteristics	Current Students		Interview	
	Frequency (N=146)	Percent (%)	Frequency (N=16)	Percent (%)
<b>1</b> Gender				
Male	61	42	7	44
Female	85	58	9	56
<b>2</b> Age of respondent				
20yrs &Below	35	24	3	19
21-30yrs	103	70	10	62
31-40yrs	0	0	0	0
Above 40yrs	8	6	3	19
<b>3</b> Level/Program				
B.Sc. (400L)	52	36	5	31
M.Sc.Class	82	56	8	50
M.Phil/Ph.D	12	8	3	19
<b>4</b> Cumulative length of stay or training in the Department				
4yrs & below	52	36	5	31
5-8yrs	86	58	8	50
Above 8yrs	8	6	3	19
<b>5</b> Highest educational qualification held by respondent				
Below B.Sc./B.Tech.	42	29	3	19
B.Sc./B.Tech.	92	63	10	62
B.Arch./M.A./ M.Sc./M.Tech.	12	8	3	19
<b>6</b> Average monthly Stipend/or income				
Below ₦ 80,000	117	80	11	68
₦ 80,000- N159,999	22	15	3	19
₦ 160,000 & above	7	5	2	13
<b>7</b> Residence location				
Off campus	21	14	3	19
On campus	125	86	13	81
<b>8</b> Distance of Residence to the Department				
Above 4.0Km	14	10	3	19
2.1-4.0 Km	51	35	4	25
Within 2.0 Km	81	55	9	56

Source: Data from same source as [22]

**Appendix B**

**Table B.5. Research Methods Attributes**

Description	Current Students		Interview	
	Frequency (N=146)	Percent (%)	Frequency (N=16)	Percent (%)
<b>1</b> Type of terminal research				
Interpretist/Antpositivist/Qualitative	67	46	7	44
Scientific/Positivist/Quantitative	79	54	9	56
<b>2</b> Mastery of research methods				
20% & Below	9	6	0	0
21-40%	25	17	3	19
41-60%	71	49	8	50
61-80%	34	23	4	25
81% & Above	7	5	1	6

**Determinants of Application of Research Methodologies in Architecture Programs in Covenant University, Ota, Nigeria**

3	Knowledge base of research methods				
	1-2	5	3	0	0
	3-4	19	13	3	19
	5-6	66	45	7	44
	7-8	48	33	6	37
	9-10	8	6	0	0
4	Duration since first became acquainted with research methods(Months)				
	12 &Below	50	34		
	13-24	34	23		
	25-36	32	22		
	37-48	6	4		
	Over48	24	17		
5	Application of qualitative research methods since acquired the knowledge including current project(s)				
	2Times & Below	42	29		
	3 & 4Times	45	31		
	5Times & Above	59	40		
6	Application of quantitative research methods since acquired the knowledge including current project(s)				
	2Times & Below	87	59		
	3 & 4Times	48	33		
	5Times & Above	11	8		
7	Application of research methods since acquired the knowledge including current project(s)				
	4Times & Below	62	43		
	5 – 8 Times	50	34		
	9Times & Above	34	23		
8	Rating of your satisfaction with department about guidance on research methods for your current or terminal research				
	1-2	4	3	0	0
	3-4	31	21	3	19
	5-6	60	41	8	50
	7-8	34	23	3	19
	9-10	17	12	2	12
9	Rating of appropriateness of methodology for current or terminal research				
	1-2	0	0		
	3-4	4	3		
	5-6	65	44		
	7-8	68	47		
	9-10	9	6		
10	Cost of carrying out Quantitative compared with qualitative research:				
	Higher than 1.00	91	62		
	1.00 & Below	55	38		
11	Cost of carrying out qualitative compared with quantitative research				
	Higher than 1.00	12	8		
	1.00 & Below	134	92		
12	Rating of standard of research methods attained by the department				
	20% & Below	3	2	0	0
	21-40%	19	13	2	13
	41-60%	52	36	5	31
	61-80%	32	22	5	31
	81% & Above	40	27	4	25

Source: Data from same source as [22]

**Appendix C**

**Table D.10. Standard Multiple Regression3a**

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.892 <sup>a</sup>	.796	.769	.380121	.796	29.367	17	128	.000

b. Dependent Variable: No. of application of research methods since acquisition of the knowledge including current projects

Appendix D

Table D.11. Standard Multiple Regression3b

ANOVA <sup>b</sup>						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	72.135	17	4.243	29.367	.000 <sup>a</sup>
	Residual	18.495	128	.144		
	Total	90.630	145			

b. Dependent Variable: No. of application of research methods since acquisition of the knowledge including current projects

Appendix E

Table D.12. Standard Multiple Regression3c

Model Summary <sup>n</sup>									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.654 <sup>a</sup>	.428	.424	.600121	.428	107.649	1	144	.000
2	.687 <sup>b</sup>	.472	.464	.578681	.044	11.868	1	143	.001
3	.720 <sup>c</sup>	.518	.508	.554821	.046	13.564	1	142	.000
4	.735 <sup>d</sup>	.541	.528	.543424	.023	7.018	1	141	.009
5	.762 <sup>e</sup>	.581	.566	.520982	.040	13.409	1	140	.000
6	.776 <sup>f</sup>	.603	.586	.508928	.022	7.711	1	139	.006
7	.793 <sup>g</sup>	.629	.610	.493886	.026	9.595	1	138	.002
8	.818 <sup>h</sup>	.670	.650	.467510	.041	17.011	1	137	.000
9	.841 <sup>i</sup>	.707	.688	.441912	.037	17.331	1	136	.000
10	.853 <sup>j</sup>	.727	.707	.427756	.020	10.151	1	135	.002
11	.867 <sup>k</sup>	.751	.731	.410240	.024	12.774	1	134	.000
12	.875 <sup>l</sup>	.766	.745	.399134	.015	8.561	1	133	.004
13	.887 <sup>m</sup>	.787	.766	.382473	.021	12.840	1	132	.000

m. Predictors: (Constant), Level/Program, Gender, Rating of appropriateness of methodology for current or terminal research, Distance of Residence to Department, Type of terminal research, Cost of carrying out qualitative compared with quantitative research, Cost of carrying out quantitative compared with qualitative research, Rating of your knowledge base of research methods, Mastery of research methods, Age of respondent, Income Classification, Duration since first became acquainted with research methods, Rating of satisfaction with department about supervisors' guidance on research method for current or terminal research

n. Dependent Variable: No. of application of research methods since acquisition of the knowledge including current projects

Appendix F

Table D.13. Standard Multiple Regression3d

Coefficients <sup>a</sup>													
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval for B		Correlations		Collinearity Statistics		
		B	Std. Error				Lower Bound	Upper Bound	Zero-order	Partial	Tolerance	VIF	
13	(Constant)	2.963	.596		-4.969	.000	4.143	1.784					
	Level/Program	.582	.143	.354	4.078	.000	.300	.864	.654	.334	.164	.215	4.661
	Gender	.378	.075	.237	5.043	.000	.230	.526	.252	.402	.203	.734	1.363
	Rating of appropriateness of methodology for current or terminal research	-.485	.067	-.401	-7.281	.000	-.616	-.353	-.297	-.535	-.293	.533	1.877
	Distance of Residence to Department	.312	.058	.262	5.339	.000	.196	.427	.195	.421	.214	.668	1.496
	Type of terminal research	.231	.081	.146	2.847	.005	.070	.391	-.067	.240	.114	.614	1.629
	Cost of carrying out qualitative compared with quantitative research	.749	.160	.261	4.685	.000	.433	1.065	.054	.378	.188	.520	1.924
	Cost of carrying out quantitative compared with qualitative research	.494	.078	.304	6.296	.000	.339	.649	.225	.481	.253	.694	1.441

## Determinants of Application of Research Methodologies in Architecture Programs in Covenant University, Ota, Nigeria

Rating of knowledge base of research methods	.413	.058	.456	7.118	.000	.298	.527	-.173	.527	.286	.394	2.540
Mastery of research methods	-.260	.051	-.303	-5.120	.000	-.360	-.160	-.266	-.407	-.206	.462	2.165
Age of respondent	.407	.083	.343	4.891	.000	.242	.571	.488	.392	.196	.328	3.051
Income Classification	-.382	.085	-.257	-4.474	.000	-.551	-.213	.048	-.363	-.180	.488	2.047
Duration since first became acquainted with research methods	.148	.040	.265	3.695	.000	.069	.227	.465	.306	.148	.313	3.191
Rating of your satisfaction with department about supervisors' guidance on research method for current or terminal research	.160	.045	.201	3.583	.000	.072	.248	-.135	.298	.144	.514	1.946

a. Dependent Variable: No. of application of research methods since acquisition of the knowledge including current projects