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PATH MODELLING OF INSTITUTIONAL VARIABLES ON EXAMINATION MALPRACTICE TENDENCY AMONG UNDERGRADUATES IN CROSS RIVER STATE, NIGERIA

Osang, Anastecia William; Anagbogu, German Efa and Ekarika, Catherine Boniface

osanganastecia@gmail.com; anagbogug@gmail.com and

ekarikakate@gmail.com

Department of Educational Foundations University of Calabar, Cross River State, Nigeria

ABSTRACT

This study modelled the relationship between institutional variables and examination malpractice tendencies among undergraduates in universities in Cross River State, employing a correlational research design. The population of this study comprises 5,832 students from the Faculties of Education of two public universities in Cross River State, Nigeria, out of which a sample of 1,167 students was selected for the study. The instrument used in the study was a questionnaire titled "Students' Opinion Questionnaire"(SOQ). The face and content validity of the instrument were determined. Ordinal Alpha reliability method, which gave reliability coefficients that ranged from 76 to .84 was used. The data collected were analysed using population t-tests, Multiple linear regression, Repeated Regression analysis, Path Analysis, and Stepwise Regression analysis, all tested at the 0.05 level of significance. The results revealed that the tendency for examination malpractice among undergraduates in universities in Cross River State is significantly high. The results further revealed that, after trimming the first hypothesised model based on the significance and meaningfulness of the paths, seven out of the ten hypothesised paths were retained. Based on the data collected and analysed, it was concluded that the extent of examination malpractice tendency among undergraduates in universities in Cross River State is significantly high. It was recommended, among other things, that universities should put in place modalities for strict examination supervision to stem the vice of cheating among students.

INTRODUCTION

The purpose of education, from primary to tertiary institutions, is to produce quality graduates who will, in turn, maintain quality control in all facets of government and private establishments, thereby promoting the nation's progress. Quality education can also promote the country's development in various aspects, including educationally, socially, economically, politically, and technologically. Quality education should be

standard, regular, appropriate and significant. It should be free from all forms of irregularity, indecency, coarseness, crudeness, licentiousness, unsuitability and lewdness (Olayinka, 2022). This is because education without quality is dangerous to both the individual, family and the nation at large.

Examination is the measurement of proficiency, knowledge or skills (orally or in written form) and evaluating the adequacy of these properties possessed by candidates. Examination serves as feedback for the teacher to ascertain the level of knowledge acquisition and a measure of knowledge retention by the learner. Any misconduct or irregularity distorts this feedback mechanism, resulting in a false outcome of the learning process and potentially leading to examination malpractice. Akaranga and Ongong (2013) stated that education is a necessary process through which young adults are equipped to live productive lives, utilising their talents and interests. It is also perceived as a means by which children can develop their unique needs and potentials, to help every individual reach their full potential (Akanni & Odofin, 2015).

Any wrongdoing or illegal action taken for one's benefit is malpractice. Examination malpractice results in a production of half-baked graduates from academic institutions, retarded educational growth and development, false sense of value and impression, students 'incapability as well as loss of confidence in candidates who are involved in examination malpractice. Examination malpractice refers to any action taken by a candidate that is likely to render the assessment useless. It is one of the greatest social menaces and cankerworms that have eaten deep into the Nigerian education system. It involves actions and behaviours that negate the orderly conduct and procedures of the examination and give a candidate an undue advantage over others (Osang, 2022).

Examination malpractice involves some form of cheating committed by candidates, either individually or in collaboration with others, before or during the examination, to gain an unfair advantage over others. Plagiarism in students' reports and project works, as well as in published research papers, is also a form of academic malpractice. Others include misrepresentation of identity or impersonation, cheating, theft of other students' work, tampering with the works of others, bringing prepared answers to examination halls, unethical use of academic resources, fabrication of results and showing disregard for academic regulations. Spying on other neighbours' work, whispering answers, scribbling answers on desks, tables, and walls of examination rooms, ceilings and clothes.

The rate of examination malpractice at all levels of education, from primary to tertiary institutions, has reached such a frightening proportion that some harsh decisions, such as the cancellation of examinations, results, and expulsion of culprits from school, have been taken to eradicate this ugly behaviour. The Federal Military Government took a bold step by promulgating a decree that imposed a 21-year jail term on those involved in examination malpractice (Njoku & Njoku, 2016). The question is, how far has this decree been enforced? Examination malpractice is capable of ruining the future of an individual, organisation and a nation at large.

Senates of universities meet time and again to address issues of examination malpractice—most of the students who appear before the senate end up being rusticated and sometimes expelled. The university authority also introduced quality assurance measures to combat the vice of cheating in schools. The cases involved include misrepresentation of identity or impersonation, cheating, plagiarism, whispering answers, scribbling answers on desks, tables, and walls, as well as leaks. That is why the researchers feel a study on factors that may be responsible for examination malpractice tendencies is pertinent. Thus, the use of a more detailed analytical tool is a better option, as this will provide a suggestive guide to a possible causal linkage between institutional variables and examination malpractice tendencies among undergraduates in universities in Cross River State, Nigeria.

Adequate provision of infrastructural facilities in Nigerian universities is one of the basic requirements for effective teaching and learning. When these facilities are provided, they help to boost the morale of both students and teachers, thereby creating a conducive atmosphere for learning. In most cases, these facilities are grossly inadequate. Some students are compelled to stand or sit on windows while lectures are going on. Some buildings lack fans and electricity to aid in reading, and science laboratories and equipment are in disrepair. Some lectures are being held outdoors due to insufficient classroom space. How can this calibre of students cope in an examination without engaging in examination malpractice?

Equally, instructional materials, which are educational inputs, are of vital importance to the teaching and learning of any course in the school curriculum. Ejiro (2016) believed that the availability and use of instructional resources would make discovered facts firmly embedded in students' memories. A well-planned and imaginative use of visual aids in lessons should significantly help banish apathy, supplement the inadequacies of books, and arouse students' interest by providing them with something practical to see and do, while also encouraging them to think things out for themselves (Ekeh & Oladayo, 2018). When these materials are not available or inadequate for students to see or practice, they seek alternative means to help themselves, which can lead to malpractice.

This study is grounded in the following theories: the Path analysis model by Wright (1921) and System theory by Hornby (1998). Path analysis was proposed by Sewall Wright in 1921 to examine the effects of hypothesised models in phylogenetic studies. According to Wright in Anagbogu (2006), the path analytic method was intended to measure the direct effect along each separate path in such a system and determine the degree to which each particular cause contributes to the variation of a given effect. Wright also acknowledged that "often" causal relations were uncertain and cautioned that this method was not intended to deduce causal relations solely from correlation coefficients. Rather, the method utilised information provided by the statistical correlations in conjunction with qualitative information regarding the causal relationships to find the consequences of hypothesised structures.

Path analysis, according to Jeon in Offiah (2017), is a method for studying direct and indirect effects. Path analysis is intended not to discover causes but to shed light on the tenability of the causal model formulated by a researcher. The researcher should consider the theory or knowledge related to what he/she want to study and then seek how to apply it. Path analysis can be considered as one of the Structural Equation Models (SEMs), which is composed of all observed variables, without using latent variables. Depending on the causal model, a variable may have a direct effect on another variable or not. Also, a variable may have more than one indirect effect on another variable. The use of path coefficients produces a correlation matrix and plays a crucial role in assessing the validity of a given causal model.

It has been suggested that path coefficients can be calculated by conducting repeated multiple regression analyses on appropriate subsets of variables (Keith, 2019). It is partly true, but if the independent variables are not correlated at all, the model cannot be analysed by multiple regressions and needs to define the correct correlation matrix by path analysis. Furthermore, in the causal model, distinction is made between exogenous and endogenous variables. An exogenous variable is a variable whose variability is assumed to be determined by causes outside the causal model under consideration. An endogenous variable is one whose variation is explained by exogenous or endogenous variables in the causal model. An endogenous variable treated as a dependent variable in one set of variables may also be conceived as an independent variable about other variables. In a causal model, no attempt is made to explain the variability of an exogenous variable or its relations with other exogenous variables. The correlation between exogenous variables is depicted by a curved line with arrowheads at both ends, thus indicating that the researcher does not conceive of one variable being the cause of another. Consequently, a relation between exogenous variables remains unanalysed in the system. An example of path analysis is stated in Figure 1 (Yang & Jeon, 2019). Figure 1 is a typical example of path analysis, where variables 1 and 2 are considered exogenous variables. Variables 1 and 2 are considered the cause of variable 3. Variable 3 is considered dependent on variables 1 and 2 and is also treated as one of the independent variables with respect to variable 4.



FIG. 1: An example of recursive pathways (Yang & Jeon, 2019)

The problem addressed in this study is the increasing tendency of students to engage in examination malpractice. The students no longer view examination malpractice as a negative phenomenon; this is a worrisome trend. A close association of students reveals that they have given different names to cheating, such as microchips, brain support, or score upgrading. Complaints of malpractices among students and lecturers are numerous. This has culminated in the formation of panels and quality assurance, with the responsibility of addressing the issue. A significant number of students are expelled and rusticated year after year, and lecturers are demoted, and others are sacked. The government has also attempted to promulgate a decree of 21 years' imprisonment for those involved in examination malpractice. However, this has yielded no positive results, as students, lecturers, and parents are still found to be involved in one form of examination malpractice or another. This is not supposed to be so in the 21st century, where education is expected to be the central pivot of national development. Despite all measures taken to combat the menace of examination malpractice, students are becoming increasingly sophisticated in perfecting the act of cheating.

That is why the researchers feel that using multivariate statistical techniques, a path can be modelled to find the relationship between institutional variables and examination malpractice tendencies. The problem of this study, therefore, is to find the causal links between institutional variables, such as the availability of infrastructural facilities, utilisation of instructional materials, teacher-student relationships, and enforcement of punishment, as they relate to the tendency towards examination malpractice.

Purpose of the study

The main objective of this study was to model the relationship between institutional variables and tendencies towards examination malpractices among undergraduates in universities in Cross River State. Specifically, the study objectives were to:

- 1. Determine the extent of examination malpractice among undergraduates.
- 2. Investigate how institutional variables collectively and individually predict examination malpractice among undergraduates.
- 3. Construct the most meaningful causal model of the influence of institutional variables on examination malpractice among undergraduates.

Research questions

The following research questions guided the study.

1. What is the extent of examination malpractice tendency among undergraduates in universities in Cross River State?

2. To what extent do institutional variables individually and collectively predict examination malpractice among undergraduates?

3. What is the most meaningful and parsimonious causal model involving institutional variables and examination malpractice among undergraduates?

Statement of hypotheses

The following null hypotheses were formulated for the study.

- 1. The extent of examination malpractice tendency among undergraduates in universities in Cross River State is not significantly high.
- 2. Institutional variables, both individually and collectively, do not significantly predict examination malpractice among undergraduates.
- 3. There is no significant most meaningful and parsimonious causal model involving institutional variables and examination malpractice among undergraduates.

Methodology

The design adopted for this study is a correlational research design. Correlational research design is a type of survey in which the researcher attempts to identify correlations between variables. This present study focuses on path modelling, which examines the relationship between independent and dependent variables, and predicts the criterion variable using predictor variables.

The area of study is Cross River State, Nigeria. The State is one of the thirty-six States in Nigeria.

The population of this study consists of 5,832 students from the Faculties of Education of the two public universities in Cross River State, Nigeria. An accidental sampling technique was employed to select the study subjects. The accidental sampling proved helpful due to the difficulties involved in assembling the students for random selection. The researcher used her discretion to select the Faculty of Education in University of Calabar and University of Cross River State from all the Faculties.

A total of two (2) faculties were selected for the study. In each of the two selected faculties, 20% was applied to determine the number of respondents used for the study. Thus, a total of 1,166 students were selected for the study. The researcher selected 20%

of the students in all the departments for the study. The reason for using 20% of the population as the sample for the study was that it can adequately represent the entire population, and data collected from them using the research instruments can be used to justify the findings for the entire population.

The instrument used in the study was a questionnaire titled "Students' Opinion Questionnaire" (SOQ). The instrument was divided into two sections: A and B. Section A was divided into four sub-sections, measuring institutional variables in terms of the availability of infrastructural facilities, utilisation of instructional materials, teacherstudent relationships, and enforcement of punishment. Meanwhile, Section B of the instrument measured tendencies towards examination malpractice on a 4-point scale.

Model specification

The general form of the regression equation for the standardized scores is as follows: $Y = \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \ldots + \beta_9 X_9$ Where

Y = Predicted standardized score (dependent variable).

 $X_1 \dots X_9$ = Independent (predicting) variables.

 $\beta_1 \dots \beta_9$ = Standardized regression beta weights.

Path analysis was used to test the formulated theoretical model. The primary objective of the path analysis in this study was to gain a thorough understanding of the patterns of relationships between the independent (predictor) variables and the dependent (criterion) variable.

Based on the assumptions and with the help of some research findings, existing theories in education and researchers' knowledge of the relationships that exist, it was possible to hypothesise the path models. The hypothesised path model for institutional and student variables, allowing for independent examination of the two sets of variables, is shown in Figure 4.

The following are the variable descriptions as used in the paths.

- X_1 = Availability of infrastructure
- X_2 = Utilisation of instructional materials
- X_3 = Teacher-student relationship
- X₄ = Enforcement of punishment

 $X_5 = Examination$ malpractice tendency

 $P_{31} - P_{95} =$ Paths drawn from variables taken as causes to variables taken as effects (dependent), which are obtained by regressing variables 2, 3, 4, 5, 6 (taken as dependent variables) on their respective predictor variables (causes).



FIG.4: The hypothesized path model for institutional variables.

Results

Research Question One

What is the extent of examination malpractice tendency among undergraduates in universities in Cross River State?

The variable involved in this hypothesis is the tendency to engage in examination malpractice. For the examination malpractice tendency among undergraduates in universities in Cross River State to be significantly high, the mean score should be significantly greater than 25 which is the reference mean (μ) (the midpoint between, which is 2.5 multiply by 10 which is the number of items that measured undergraduates' examination malpractice tendency). This hypothesis was analysed using a population t-test, tested at the .05 level of significance, as presented in Table 6.

The results in Table 6 revealed that the mean scores of 26.88 with standard deviations of 5.34 obtained by the subjects as regards examination malpractice tendency is less than the reference mean (μ) of 25. The result also indicated that the calculated t-value of 12.007 with p-value of .000 is statistically significant at .05 level since the t-

value is less than .05. Based on these, the analysis of the research question on the extent of examination malpractice tendency among undergraduates in universities in Cross River State indicated that the extent of examination malpractice tendency among undergraduates in universities in Cross River State is significantly high. Research question two

To what extent do institutional variables individually and collectively predict examination malpractice tendency among undergraduates? The independent (predictor) variables involved in this hypothesis were institutional variables, such as the availability of infrastructure, utilisation of instructional materials, teacher-student relationships, and enforcement of punishment. In contrast, the dependent variable was the tendency towards examination malpractice. The hypothesis was analysed using Multiple linear regression analysis, which showed the composite and relative predictive effects of the institutional variables on examination malpractice tendency, as presented in Table 7.

TABLE 6

Population t-test analysis for the extent of examination malpractice tendency among undergraduates in universities in Cross River State (N=1167)

Variable		\overline{X}	SD	μ	Mean	t-value	p-level
					difference		
Examination	malpractice	26.88	5.34	25	1.88	12.007*	.000
tendency	-						
1 ~ 1							

*Significant at .05 level, p<.05; df=1166.

TABLE 7

Multiple Regression analysis for composite and relative predictive effects of institutional variables on examination malpractice tendency among undergraduates in Cross River State

Source of variance	Sum of Squares	df	Mean Square	F-ratio	p-level
Regression	8982.677	4	2245.669	107.703*	.000
Residual	24228.306	1162	20.851		
Total	33210.984	1166			

	Unstandardized		Standardized		
	Coe	fficients	Coefficients		
Variables	В	Std. Error	Beta	t	p-level
(Constant)	17.519	1.103		15.888*	.000
Availability of	173	.042	155	-4.128*	.000
infrastructure					
Utilization of	649	.072	348	-9.012*	.000
instructional materials					
Teacher-student	191	.044	114	-4.368*	.000
relationship					
Enforcement of	.039	.043	.025	.914	.361
punishment					

*Significant at .05 level; R = .520; $R^2 = .270$; Adjusted $R^2 = .268$.

Dependent variable: Examination malpractice tendency

The result in Table 7 revealed that the combined contribution of institutional variables on examination malpractice tendency among undergraduates in Cross River State produced an F-ratio of 107.703 with a p-value of .000, which is statistically significant at .05 level of confidence. This result indicated that institutional variables are significant predictors of examination malpractice tendency among undergraduates in Cross River State. Institutional variables also produced a coefficient of multiple Regression (R) of .520, a multiple R-square (R²) of .270 and an adjusted R-square (R²) of .268. The adjusted (standardised) R² of .268 implies that institutional variables accounted for 26.8 percent of the variance in examination malpractice tendency among undergraduates in Cross River State.

The results further indicated that the standardised regression beta weights (β) obtained for institutional variables were -.155, -.348, -.114, and .025 for the availability of infrastructure, utilisation of instructional materials, teacher-student relationship, and enforcement of punishment, respectively, in predicting examination malpractice

tendency among undergraduates in Cross River State. In terms of the magnitude of the prediction, the availability of infrastructure, utilisation of instructional materials, and teacher-student relationship had significant pessimistic predictions on the tendency towards examination malpractice among undergraduates, with the utilisation of instructional materials having the most significant effect. At the same time, the enforcement of punishment did not significantly predict the tendency towards examination malpractice among undergraduates. Based on the results, the research question on the extent to which institutional variables individually and collectively predict examination malpractice tendency among undergraduates was rejected for the availability of infrastructure, utilisation of instructional materials and teacher-student relationship, but was upheld for enforcement of punishment.

The general regression equation for institutional variables and examination malpractice tendency among undergraduates in Cross River State is presented as follows: EMT = 17.519 - .173AI - .649UIM - .191TSR + .039EP

Where: EMT = Examination malpractice tendency

AI = Availability of infrastructure

UIM = Utilisation of instructional materials

TSR = Teacher-student relationship

EP = Enforcement of punishment

Research question three

What is the most meaningful and parsimonious causal model involving institutional variables and examination malpractice tendency among undergraduates?

To answer this research question, the data collected were analysed to obtain the original correlation coefficients of the study variables and the path coefficients for each hypothesised pathway in the hypothesised model. The results are presented in Table 10 and Figure 7.

TABLE 10

The most meaningful causal model for the effects of institutional variables on examination malpractice tendency among undergraduates in Cross River State

Path	Path coefficient	Directions	p-value
P ₃₁	.738**	Indirect	.000
P_{41}	.188**	Indirect	.000
P ₆₃	.387**	Indirect	.000
P ₆₄	182**	Indirect	.000
P ₉₁	155**	Direct	.000
P93	348**	Direct	.000
P94	114**	Direct	.000

**Significant at p<.05

* Meaningfulness at path coefficient \geq .05.

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FIG.7: Parsimonious model for the effects of institutional variables on examination malpractice tendency among undergraduates in Cross River State.

Where:

X_1	=	Availability of infrastructural facilities
X3	=	Utilization of instructional materials
X_4	=	Teacher-student relationship
X_6	=	Enforcement of punishment
X9	=	Examination malpractice tendency

The results presented in Table 10 which were also illustrated in Figure 7 indicated that out of the 10 pathways in the hypothesized model for institutional variables and examination malpractice tendency, only seven paths met the criteria for significance and meaningfulness (Any path with a p-level of less than .05 is said to be statistically significant while any path whose beta weight is .05 and above is considered as meaningful path way). Figure 4 shows the parsimonious model involving the seven surviving paths for institutional variables and examination malpractice tendency. The numbers on each pathway indicates the correlation coefficients while the beta weight (β) in brackets. This shows that after trimming using significance and meaningfulness of the

paths, seven out of the ten hypothesised paths were retained, which are four indirect and three direct pathways.

Research question nine

What proportions of the effect of institutional variables on examination malpractice tendency among undergraduates are direct and indirect? The data in Table 15 were used to provide an answer to this research question by showing the direct effects, indirect effects, and the total effect of institutional variables, such as the availability of infrastructure, utilisation of instructional materials, teacher-student relationships, and enforcement of punishment, on the criterion variable.

montational variat		minution man		actively annound t	andergrad	
Cross River State						
Variables	Direct	Percentage	Indirect	Percentage	Total	Percentage
	effect	of DE	effect	ofIE	effect	of TE
	(DE)		(IE)		(TE)	
Availability of infrastructure	.155	16.3	.289	30.4	.444	46.7
Utilization of instructional materials	.348	36.6	.014	1.5	.362	38.1
Teacher-student relationship	.114	12.0	.005	.1	.119	12.1

0

.308

2.6

68.0

0

32.0

TABLE 15 Proportion of the direct and indirect decomposition of the effects of institutional variables on examination malpractice tendency among undergraduates in Cross River State

NB: The effects are in an absolute sense.

.025

.642

The information in Table 15 revealed that the proportion of the total direct to total indirect effects of institutional variables on examination malpractice tendency among undergraduates was 68:32, respectively. The results also revealed that the direct proportions for availability of infrastructure, utilisation of instructional materials, teacher-student relationship and enforcement of punishment respectively were approximately 16.3:36.6:12.0:2.6 while that of the indirect proportions were approximately 30.4:1.5:0.1:0. The value of zero in the ratio implies that enforcement of punishment does not have indirect effect on examination malpractice tendency among undergraduates in the first model.

Conclusion

Enforcement of

punishment

Total

Based on the data collected and analysed, it was concluded that the extent of examination malpractice tendency among undergraduates in universities in Cross River State is significantly high. It was also concluded that institutional variables are significant

2.6

100

.025

.950

predictors of examination malpractice tendency among undergraduates in Cross River State.

5.3 **Recommendations**

Regarding the research findings, the following recommendations were deemed necessary.

- 1. Universities should put in place modalities for strict examination supervision to stem the vice of cheating among the students
- 2. Adequate funds should be made available for the construction of infrastructural facilities to support effective classroom instruction.
- 3. Teachers should inculcate in students a positive values orientation towards examination and how to avoid examination malpractice.

References

- Adalikwu, S., & Isaac, I. (2016). The influence of instructional materials (teaching aids) on examination malpractices in senior secondary in Cross River State. *Journal of Educational studies and Research*, 4(2), 105-113.
- Akanni, O & Odofin, B (2015). Reducing Examination Malpractices in Nigerian Schools through Effective Continuous Assessment (C.A) Techniques as an Alternative to OneShot Examination in Osun State, Nigeria. *American Journal of Educational Research*, 3(6), 783-789. doi: 10.12691/education-3-6-18
- Akaranga, S., & Ongong, P. (2013). Quality assurance: A practical solution to examination malpractices in Nigerian secondary schools. *International Journal of Africa and African American Studies*, 5(2), 202-212.
- Anagbogu, G. E. (2006). Path analysis model of the correlates of senior secondary school three student's performance in financial accounting for Southern Education Zone of Cross River State, Nigeria. Unpublished master's thesis submitted to Univsersity of Calabar, Calabar, Nigeria.
- Ayoade, A & Farayola, P (2020). Dynamics Of Examination Malpractice Among the Key Players in Nigeria. *Daffodil International University Journal of Science and Technology*, 15(2), 25-32.
- Bassey, S., & Amie-Ogan, P. (2018). The availability and utilization of instructional materials for effective teaching in Public Junior secondary schools in Port Harcourt Metropolis, Rivers State. *International Journal of Social Science and Humanity*, 3(4), 416-419.
- Ejiro, J. (2016). The effect of inadequate infrastructural facilities in academic performance of students of Oredo Local Government Area of Edo State. *European Journal of Education Studies*, 1(3), 101-108.
- Ekeh, W. & Oladayo, N. (2018). Psycho-social correlates of examination malpractices among secondary school students in Ughelli North Local Government Area of Delta State. *African Journal of Education and Technology*, 1(2): 68-75.

- Keith, T. Z. (2019). Multiple regression and beyond: An introduction to multiple regression and structural equation modeling. Routledge.
- Njoku, D. & Njoku F. (2016). Curbing examination malpractice in secondary schools in Nigeria through enforcement of punishment and moral education. *A Journalof the Nigeria Council*, 4 (1&2).
- Offiah, C. I. (2017). A causal model of self regulatory attributes and academic performance in Mathematics among secondary school students in Enugu Education Zone, Enugu State. A Master's Degree Thesis submitted to Graduate School, University of Calabar, Calabar, Cross River State, Nigeria.
- Olayinka, A. B. (2022). Parents' variables, age and gender as contributory factors to students' involvement in examination malpractices in secondary schools in South-West, Nigeria.
- Onyigbuo, S. U. (2005). National Disgrace: Examination malpractice. Enugu.
- Osang, A. W.(2022). Path modelling of institutional and students' variables on tendencies to examination malpractice among undergraduates in Cross River State, Nigeria. Unpublished Ph.D dissertation, University of Calabar, Calabar- Nigeria.
- Yang, S., & Jeon, S. (2019). Recursive path planning and wind field estimation for precision airdrop. *Journal of Guidance, Control, and Dynamics*, 42(6), 1429-1437.