



BRIEF REPORT

REVISED Evaluation of the scholastic performance of students in 12 programs from a private university in the south-west geopolitical zone in Nigeria [version 2; peer review: 1 approved, 2 approved with reservations]

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Abstract

Cumulative grade point average (CGPA) is a system for calculation of GPA scores and is one way to determine a student's academic performance in a university setting. In Nigeria, an employer evaluates a student's academic performance using their CGPA score. For this study, data were collected from a student database of a private school in the south-west geopolitical zone in Nigeria. Regression analysis, correlation analysis, and analysis of variance (F-test) were employed to determine the study year that students perform better based on CGPA. According to the results, it was observed that students perform much better in year three (300 Level) and year four (400 Level) compared to other levels. In conclusion, we strongly recommend the private university to introduce program that will improve the academic performance of students from year one (100 level).

Keywords

Academics, Performance, Students, Science and Engineering, Private University, Programmes

Open Peer Review

Reviewer Status

	Invited Reviewers		
	1	2	3
REVISED			
version 2	report	report	
published 10 Oct 2019	↑	↑	
version 1			
published 05 Feb 2019	report	report	report

- Robert G. Carroll**, East Carolina University, Greenville, USA
- Semiu Akanmu** , North Dakota State University, Fargo, USA
Augustine University, Ilara_Epe, Nigeria
- Raheela Asif**, N.E.D University of Engineering & Technology, Karachi, Pakistan

Any reports and responses or comments on the article can be found at the end of the article.

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Author roles: **Ogundokun RO:** Conceptualization, Investigation, Writing – Original Draft Preparation; **Adebiyi MO:** Conceptualization, Investigation, Writing – Original Draft Preparation; **Abikoye OC:** Conceptualization, Methodology, Project Administration, Supervision; **Oladele TO:** Conceptualization, Methodology, Project Administration, Supervision; **Lukman AF:** Investigation, Validation; **Adeniyi AE:** Data Curation, Software, Validation; **Adegun AA:** Writing – Review & Editing; **Gbadamosi B:** Writing – Review & Editing; **Akande NO:** Data Curation, Software, Validation

Competing interests: No competing interests were disclosed.

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The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

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First published: 05 Feb 2019, 8:154 (<https://doi.org/10.12688/f1000research.16762.1>)

REVISED Amendments from Version 1

To react to the reviewers' comment, in this revision, an extensive and detailed literature review was provided which demonstrates the extensive knowledge in the research as well as recognizing the existing achievements in the area. The in-text citation has been improved as suggested by the reviewers and the reason for embarking on the study was included in the introduction session. A clearer definition of GPA and CGPA was also stated in the article. Additional references used for the revisions were incorporated into version 2 of the article

Any further responses from the reviewers can be found at the end of the article

Introduction

Grade Point Average (GPA) and Cumulative Grade Point Average (CGPA) are two concepts usually made mentioned in the education domain and they signified the diverse systems of awarding undergraduates' scores based upon their educational performances in their different subjects (Quora, 2019). GPA is computed by summing the total scores and then divide by the credits hours offered by the student. CGPA is the average of the GPA of a particular student which he had acquired in an institution in the courses he had offered. It is also computed by summing the scores acquired by students and then dividing by the computation of his overall credit units. GPA is normally computed in a distinct semester while CGPA is computed for the all-inclusive period of a program in an institution and for students to acquire a good CGPA, the good GPA in all the years must have been obtained by students (Quora, 2019).

In the white-collar job market now, there is high competition among young graduates. Academic performance is one indicator that highlights university students' qualification and this is mostly measured using the cumulative grade point average (CGPA). Most employers use CGPA to screen out candidates searching for jobs, and candidates with a higher CGPA are selected (Yogendra & Andrew, 2017). Therefore, the performance of students (Oladele *et al.*, 2019) in universities should be a concern not only to administrators and educators but also to corporations in the labor market.

Students have to place greater effort in their study to obtain a good grade in order to fulfil the demands of an employer and this makes academic achievement the main factor considered by employers in the recruitment of workers, especially newly graduated students (Yogendra & Andrew, 2017). The objective of the present study is to determine the study year that students perform better academically across 12 programs in a private university in the south-west geopolitical zone in Nigeria. This study observed that there are few references on the impact of GPA on students' overall performance and that was the gap filled in this study.

Literature review

Cullen *et al.* (1996) shows that students' tertiary academic performance is not influenced by their gender. Erdem *et al.* (2007) tried to establish which social-economics and demographic

factors have effects on students' cumulative grade point average. The authors surveyed at Gaziosmanpaşa University and the targeted population were grade four students. They found out that factors such as the high school a student graduated from, sex, parent's academic level, and the reading period influence the grade point average of undergraduates. The study of Soto & Anand (2012) shows that student attendance and GPA had significant effects on student performance. Mlambo (2012) opined that gender, age, learning preferences and entry qualification did not cause any significant variation in the academic performance of a student. Rajandran *et al.* (2015) considered the influence of age, sex, race, post-secondary level result and place of origin on the academic performance. 2013/2014 year one students of the University of Malaysia, Faculty of Economics and Administration was the case study. One hundred students were sampled using cross-tabulation and multinomial logistic regression. Results revealed that the effect of gender and place of origin are insignificant while students' entry qualification have significant effects on the CGPA of the year one students. Foen *et al.* (2016) examined the influence of time used among students to educational accomplishment. The authors observed that the time exhausted on unrelated school undertakings has a negative relationship with CGPA. Fadelelmoula (2018) revealed that lecture attendance affects undergraduates' performance.

Methods

Primary data was extracted from Covenant University's student database (John *et al.*, 2018). The dataset contains the cumulative grade point averages (CGPA) from the first to the fourth year of study and the overall CGPA of students.

IBM Statistical Package for Social Sciences (IBM 20) was used to analyze the data of the scholastic performance of students in 12 programs at the College of Science and Engineering within the year 2010 to 2014. The statistical methodology includes regression analysis, analysis of variance (ANOVA), and descriptive statistics (Lukman *et al.*, 2018).

Approval to use the data was obtained from the Ethical Committee of Landmark University, which is affiliated with Covenant University.

Results

A total of 12 programs were assessed, which included 2490 students. The frequency distribution of the number of students who attended the twelve (12) programs and their graduation years are depicted in Table 1 and Table 2, respectively. The descriptive statistics are provided in Table 3. The results show that the mean performance of all the students at each of the level is not too different from each other. Figure 1 shows a histogram of the cumulative CGPA of students for the years 2010–2014. The distribution of the data is skewed to the right which shows that a high number of the students have a CGPA that is between 2 and 5. The number of students with a CGPA that is less than 2 is low.

Table 4 shows the correlation matrix of the variables. The variables include CGPA 100 level, CGPA 200 level, CGPA 300 level, CGPA 400 level, CGPA 500 level and the overall CGPA.

Table 1. Number of students who attended 12 programs at a private university in Nigeria.

Program	Frequency of students (n)	%	Cumulative Percentile
BCH	142	5.7	5.7
CEN	237	9.5	15.2
CHE	214	8.6	23.8
CHM	111	4.5	28.3
CIS	342	13.7	42.0
CVE	167	6.7	48.7
EEE	418	16.8	65.5
ICE	245	9.8	75.3
MAT	61	2.4	77.8
MCB	168	6.5	84.3
MCE	184	7.4	91.7
PET	206	8.3	100.0
Total	2490	100.0	

Table 2. Number of students who graduated from a private university in Nigeria between 2010–2014.

Year	Frequency of students (n)	%	Cumulative Percent
2010	439	17.6	17.6
2011	362	14.5	32.2
2012	576	23.1	55.3
2013	636	25.5	80.8
2014	477	19.2	100.0
Total	2490	100.0	

Table 3. Descriptive Statistical Table for Program of Study, Graduation Year, Level CGPA and the Cumulative CGPA for 2010–2014.

	N	Minimum	Maximum	Mean		Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic
CGPA100	2490	1.59	5.00	3.7390	.01299	.64831
CGPA200	2490	1.21	5.00	3.3448	.01545	.77112
CGPA300	2490	.63	5.00	3.4353	.01749	.87290
CGPA400	2490	.00	5.00	3.5713	.01594	.79547
CGPA500	2490	1.73	4.99	3.5379	.01374	.68576

A strong positive and significant relationships exist between CGPA in the different level and the overall CGPA. The coefficient of determination (R^2) in Table 5 shows that the cumulative grade point average in each level explained about 98.1% of the variations in the response variable (the overall CGPA). The F-test shows that the overall regression model is significant

(P -value=0.000<0.05). It was also observed that each of the variables has a positive and significant impact on the overall CGPA. The performance of the students in 200 level is more significant (See Table 5). The maximum variance inflation factor shows that explanatory variables are not correlated, that is there is no multi-collinearity problems (See Table 5).

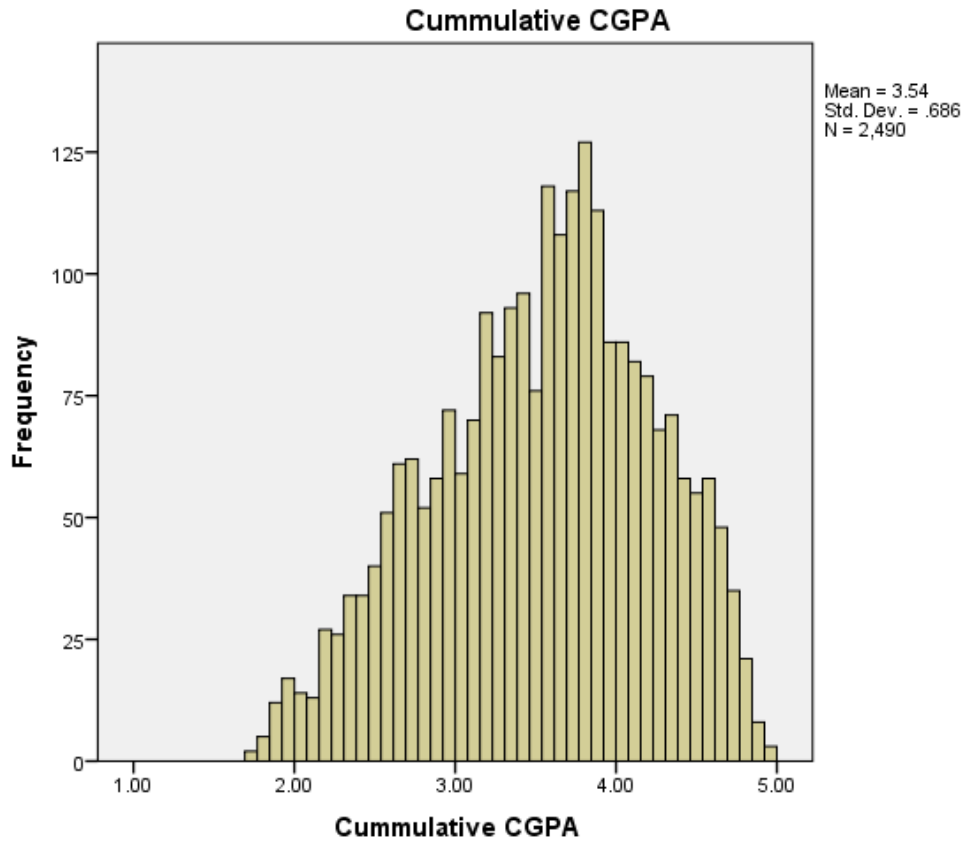


Figure 1. Histogram for students’ cumulative grade point averages between 2010 and 2014 at a private university in Nigeria.

Table 4. Correlation Analysis output.

		GPA100	GPA200	GPA300	GPA400	CGPA
CGPA100	Pearson Correlation	1	.718**	.605**	.583**	.795**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	2490	2490	2490	2490	2490
CGPA200	Pearson Correlation	.718**	1	.788**	.718**	.907**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	2490	2490	2490	2490	2490
CGPA300	Pearson Correlation	.605**	.788**	1	.812**	.911**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	2490	2490	2490	2490	2490
CGPA400	Pearson Correlation	.583**	.718**	.812**	1	.878**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	2490	2490	2490	2490	2490
CGPA	Pearson Correlation	.795**	.907**	.911**	.878**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	2490	2490	2490	2490	2490

**Correlation is significant at the 0.01 level (2-tailed).

Table 5. Regression Analysis results.

Ordinary Least Squares Estimate Dependent variable=CGPA			
Variable	Coefficient	Std error	t-stat (p-value)
C	0.043	0.012	3.762 (0.000)
CGPA100	0.246	0.004	57.846 (0.000)
CGPA200	0.262	0.005	56.271 (0.000)
CGPA300	0.247	0.004	57.003 (0.000)
CGPA400	0.238	0.004	56.371 (0.000)
Diagnostic tests			Statistics
R ²			0.981
F-test			31795.426(0.000)
Maximum Variance Inflation Factor			3.933

*P-value in the parenthesis.

Results show that overall performance of each student depends on their academic performance in each level.

Conclusion

In this report, we have analyzed the performance of students in 12 programs at a private university in Nigeria. From the various analysis carried out, it was observed that a large number of students graduated in 2013, and from the 12 programs students of electrical and electronic engineering have the highest percentage of graduate students. The descriptive statistics show that the mean performance of all the students at each of

the level is not too different from each other. The performance of the student at each level is pivotal to their overall CGPA. In conclusion, we strongly recommend the private university to introduce program that will improve the academic performance of students from year one (100 level).

Data availability

Zenodo: Dataset on the academic performance of students in 12 programmes from a private university, <http://doi.org/10.5281/zenodo.1482513> (Oluwaseun *et al.*, 2018).

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[Reference Source](#)

Open Peer Review

Current Peer Review Status:   

Version 2

Reviewer Report 21 October 2019

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Semiu Akanmu 

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I acknowledged the fact that the authors have attended to (some) of the suggested revisions. However, there are still three issues with the current revised version of the work. Two are major, while one is minor.

The minor issue is the use of Quora as a bibliographical reference. I am not sure if the publisher has a lenient provision for this. But I do not think Quora's posts can pass peer review or sound publishing practice tests. I will rather advise alternative verifiable materials, even if it is university handbook for the definitions of GPA and CGPA.

The major issues are (a) literature review and (b) conclusion sections of the paper.

The literature review section, as it is currently, is bibliography listing: A said this, B said this, and C reported this. This is listing of bibliography not reviewing of literature. In review, we will want to see what do(es) A, B, and C have in common and what differentiate them -the constructs studied, demography/sample analyzed and results reported. Review must synthesize the literature, highlight similarity or/and differences, and what might account for these, from the authors' perspectives. This is what is called scholarly footing, which must inevitably form the foundation of the new study.

The conclusion section, unbelievably, did not include the discussion part, and not in any distinct section of the article. The discussion part, either as a distinct section or part of the conclusion section is very important. This is where the findings of your study are situated within those of past related works (which you would have reviewed in the literature review section). It is expected to show what you have done differently as a way of providing different context for previous similar studies, complementing previous studies, or contending previous findings.

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Empirical methods in software engineering and information systems.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Reviewer Report 17 October 2019

<https://doi.org/10.5256/f1000research.22947.r54978>

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Robert G. Carroll

Brody School of Medicine, East Carolina University, Greenville, NC, USA

Thank you for addressing my concerns.

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Medical Education

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Version 1

Reviewer Report 09 August 2019

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Raheela Asif

Department of Computer Science & Software Engineering, N.E.D University of Engineering & Technology, Karachi, Pakistan

Is the work clearly and accurately presented and does it cite the current literature?

Literature review doesn't (directly) lead to the work of this study. Authors should provide an extensive and detailed literature review, which demonstrates their extensive knowledge in the research field and the recognition of the existing achievements in the area.

Is the study design appropriate and is the work technically sound?

The authors should also explain the main differences between their research and the previous achievements.

The final conclusions provided in the paper are not clearly formulated and correspond to the presented research results. Further steps of the performed research should also be identified by the authors.

Is the work clearly and accurately presented and does it cite the current literature?

Partly

Is the study design appropriate and is the work technically sound?

Partly

Are sufficient details of methods and analysis provided to allow replication by others?

Yes

If applicable, is the statistical analysis and its interpretation appropriate?

Yes

Are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions drawn adequately supported by the results?

Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Educational Data Mining

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 02 Oct 2019

Roseline Ogun dokun, Landmark University, Omu-Aran, Nigeria

Literature review doesn't (directly) lead to the work of this study. Authors should provide an extensive and detailed literature review, which demonstrates their extensive knowledge in the research field and the recognition of the existing achievements in the area.[s1]

[Response] An extensive and detailed literature review that demonstrates extensive knowledge in this field had been attended to as advised by the reviewer.

The authors should also explain the main differences between their research and the previous achievements.

The final conclusions provided in the paper are not clearly formulated and correspond to the presented research results. Further steps of the performed research should also be identified by the authors.[s1]

[Response] These have been attended to as suggested by the reviewer

Competing Interests: There are no competing Interests disclosed by authors

Reviewer Report 05 July 2019

<https://doi.org/10.5256/f1000research.18322.r50772>

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Semiu Akanmu

¹ North Dakota State University, Fargo, USA

² Augustine University, Ilara_Epe, Lagos, Nigeria

Citing relevant literature:

I find the in-text citations extremely scanty. The introduction which should weave the justification(s) of the study in specific terms and how it intends to attend to either a practical problem or/and a theoretical problem is inadequate. Explanations provided in the Introduction section generally addressed why "the performance of students should be of concern", not specifically why an investigation of the relationship between the study year and student grade should be conducted. Perhaps, and this should be justified in the literature, it is (a) to be able to design a level-specific intervention program that would support academic performance, (b) to serve as foundation for future studies that would identify factors that contribute to the positive or negative influence of a study level on the student grade.

There is a slight mention of this in the concluding sentence, but more emphasis on the "why this study?" should be made known at the Introduction section.

In the same vein, there should be clearer definitions of GPA and CGPA (on level basis and as overall), their relationship, probably in mathematical terms.

Design of the study, methodology and data analysis:

The concluding part of the Introduction section reads that " The objective of the present study is to determine the study year that students perform better academically across 12 programs" which best informs the choice of descriptive and the correlation analysis. Regression is therefore unnecessary because it accounts for influence of a variable on the other, and it must be with adequate attention to all latent and confounding variables.

I also did not see ANOVA, though mentioned in the methods, in the data analysis. If it would be needed, there should thorough reading of its justification and how best it suits this work. I will suggest reading Julie Pallant's Guide to Using SPSS for further insights.

Also, Variance Inflation Factor (VIF) is wrongly interpreted. Therefore, this statement "The maximum variance inflation factor shows that none of the variables is correlated" cannot be correct because (a) it contradicts an earlier statement that "A strong positive and significant relationships exist between CGPA in the different level and the overall CGPA", and (b) does not explain variance, which is square of the

standard deviation, in view of understanding the variables' multi-collinearity.

Note that correlation is synonymous to relationship, and it does not mean Variance in statistical terms.

Discussion and Conclusion:

The conclusion, since it ordinarily relied heavily on the data analysis and literature cannot be said to be adequate. There are no past related studies to situate the findings of this study and establish the fresh insights it attempts bring forth. This requires a Discussion section. A better analysis and inferences would then address the concluding section.

Required corrections:

1. Review 5 -10 past related studies to partly support your introduction, especially the justification of the study in specific terms, and as literature to situate your findings in a discussion section.
2. Stick to "finding relationship", thus, descriptive correlation analyses would be sufficient. These, however, must be done thoroughly with report on data treatment and cleansing, and justification of the suitability of the statistical method.

Is the work clearly and accurately presented and does it cite the current literature?

Partly

Is the study design appropriate and is the work technically sound?

Partly

Are sufficient details of methods and analysis provided to allow replication by others?

Partly

If applicable, is the statistical analysis and its interpretation appropriate?

Partly

Are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions drawn adequately supported by the results?

Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Empirical methods in software engineering and information systems.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 02 Oct 2019

Roseline Ogundokun, Landmark University, Omu-Aran, Nigeria

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[Response]All these suggestions have been attended to by the authors

There is a slight mention of this in the concluding sentence, but more emphasis on the "why this study?" should be made known at the Introduction section.

In the same vein, there should be clearer definitions of GPA and CGPA (on level basis and as overall), their relationship, probably in mathematical terms.

[Response] These have been included in the study (manuscript)

The concluding part of the Introduction section reads that " The objective of the present study is to determine the study year that students perform better academically across 12 programs" which best informs the choice of descriptive and the correlation analysis. Regression is therefore unnecessary because it accounts for influence of a variable on the other, and it must be with adequate attention to all latent and confounding variables.[s1]

[Response]These have been attended to as suggested by the reviewer

I also did not see ANOVA, though mentioned in the methods, in the data analysis. If it would be needed,[s1]

[Response]This reflects in the regression table (F-test). The Anova in regression is used to assess the overall significance of the model.

Competing Interests: There is no competing Interests disclosed by the authors

Reviewer Report 01 May 2019

<https://doi.org/10.5256/f1000research.18322.r47348>

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Robert G. Carroll

Brody School of Medicine, East Carolina University, Greenville, NC, USA

This paper describes the grade point average variances in students enrolled in a private university during a 5 year period. Analysis revealed that grade point averages were not significantly different based on program of study. The cumulative grade point average, a number derived from the grade point average in each year, was significantly correlated with each of the component year grade point averages.

Tables 1 and 2 include a column for cumulative percent, which does not add any useful information, and can be deleted. The rightward shift in figure 1 may be explained by dismissal of students with low GPAs - but no indication of dismissal/attrition is indicated in the manuscript. The conclusion in the abstract that students perform much better in level 3 and 4 do not appear supported by table 3, and is not mentioned in the Conclusion section of the paper .

Is the work clearly and accurately presented and does it cite the current literature?

Yes

Is the study design appropriate and is the work technically sound?

Partly

Are sufficient details of methods and analysis provided to allow replication by others?

Yes

If applicable, is the statistical analysis and its interpretation appropriate?

Partly

Are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions drawn adequately supported by the results?

Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Medical Education

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 02 Oct 2019

Roseline Ogundokun, Landmark University, Omu-Aran, Nigeria

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Tables 1 and 2 include a column for cumulative percent, which does not add any useful information, and can be deleted. The rightward shift in figure 1 may be explained by dismissal of students with low GPAs - but no indication of dismissal/attrition is indicated in the manuscript. The

conclusion in the abstract that students perform much better in level 3 and 4 do not appear supported by table 3, and is not mentioned in the Conclusion section of the paper .[Response]

[Response]All these suggestions have been attended to as suggested by the authors and the necessary revision had been made in the manuscript.

Competing Interests: Authors disclosed that there is no competing interest

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