

International Journal Research Publication Analysis

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MODERATING EFFECTS OF TUTORIAL QUALITY AND ATTENDANCE RATE ON RELATIONSHIP BETWEEN TUTORIAL PARTICIPATION AND ACADEMIC PERFORMANCE AMONG GRADUATES IN ILE-IFE, NIGERIA

Omokanye Sunday Akingbola^{*1}, Uthman, Tinuoye Jamiu²; Mathias, Olufunmilayo Abike³; Omidiora, Josiah Funminiyi⁴

¹Institute of Public Health, Obafemi Awolowo University, Ile-Ife, Osun State, Nigeria.

²Obafemi Awolowo University, Ile-Ife, Osun State, Nigeria.

³School of Health Information Management, OAUTHC, Ile-Ife, Osun State, Nigeria.

⁴School of Health Information Management, OAUTHC, Ile-Ife, Osun State, Nigeria.

Article Received: 02 June 2026

*Corresponding Author: Omokanye Sunday Akingbola

Article Revised: 22 June 2026

Institute of Public Health, Obafemi Awolowo University, Ile-Ife, Osun State, Nigeria.

Published on: 11 July 2026

DOI: <https://doi-doi.org/101555/ijrpa.5826>

ABSTRACT

Background: Instructional interventions and contextual learning conditions are factors that affect academic performance. Even though the use of tutorial participation to enhance learning outcomes has gained popularity, its success may be determined by the quality and rate of attendance of the tutorials. This paper has discussed the moderating role of the quality of tutorials and the attendance rate on the relationship between tutorials participation and academic performance among graduates in Ile-Ife, Nigeria.

Methods: An analytic design was cross-sectional with 81 graduates who were chosen using full enumeration. Structured questionnaires were used to collect data on tutorial participation, tutorial quality and attendance rate and academic performance was obtained through institutional records. The quality of the tutorials was measured using a Likert scale and the attendance was measured on a Likert scale according to frequency of attendance. Moderation analysis (PROCESS Macro Model 1 in SPSS version 30.0 at $p < 0.05$) was used to analyse quantitative data. Thematic analysis was used to analyse qualitative data in the form of focus group discussions.

Results: The results indicated that 92.2% of the participants rated the tutorial quality as good or excellent, and only 3.1% rated it as being fair. The 95.0% of respondents (37.5% good,

57.5% excellent) rated the teaching methods as good or excellent (53.8% good, 43.8% excellent). The attendance was usually good with most participants reporting frequent/regular attendance and citing such benefits as better understanding and being prepared to take CBT exams.

Although there were such positive perceptions, moderation analysis showed that the quality of tutorials was not a significant moderator of the relationship between tutorial participation and academic performance ($B = -0.2953$, $p = 0.4683$, $\Delta R^2 = 0.0084$). Likewise, the attendance rate was not significantly modulating the relationship ($B = -0.1969$, $p = 0.3245$, $\Delta R^2 = 0.0156$). The explanatory power ($R^2 = 0.022$ and 0.021 respectively) of both models was weak.

Qualitative results indicated that the quality of tutorials had a strong association with lecturer competence, use of CBT-based materials, structured teaching and assessment strategies e.g. mock tests and pre/ post-tests. Regular attendance was said to enhance understanding, peer interaction, and exam preparation whereas irregular attendance was linked to work and scheduling issues. All in all, the two factors improved both the learning experience and were seen to have an indirect effect on performance.

Conclusion: Though the quality of tutorial and attendance rate were rated highly and enhanced learning experiences, they did not significantly moderate the relationship between tutorials attendance and academic performance. The results of the academic performance can thus be expected to be affected by other instructional and learner based factors.

Recommendation: The tutorial programmes should be combined with formal academic support provision regimes like continuous assessment, mentoring, standardized instructional delivery, and monitoring student engagement to enhance academic performance.

1. BACKGROUND OF THE STUDY

Academic performance is a crucial measure of educational achievement, the extent to which students attain the desired learning outcomes in an academic system. Nonetheless, it has been shown that the performance of students in most of the developing countries, including Nigeria, is still below the global standards, and the problems are still persistent (1). In post-secondary education, academic performance is a product of the interaction between student attributes, teaching, and learning methods, and institutional factors (2). As a means of supplementing the learning process, many institutions have implemented tutorial programs as an additional instructional tool to serve as a means of enhancing understanding, improving engagement and improving academic outcomes.

Tutorial sessions are organised educational support activities aimed at giving further instructions in addition to formal lectures. They are commonly known as a potent pedagogical tool, especially in such fields as disciplines where intensive conceptual knowledge is required (1). Empirical studies indicate that tutorials enhance academic success because they offer personalized learning, feedback, and learning collaborations (3,4). Nevertheless, not all students are equally successful with tutorial programs because disparities in implementation and student-student interaction usually affect the results. Specifically, the quality of tutorial and student attendance have been found as significant contextual variables that can determine the effectiveness of tutorial interventions.

The quality of tutorials is a measure of how well the tutor delivers the tutorials, in terms of competency, teaching methods and learning environment whereas attendance rate is an indicator of the consistency of student attendance in the tutorial sessions. The study by Tinto (5) indicates that academic performance is a factor of interaction between the engagement of students and institutional environment which suggests that perceived benefits of academic interventions are not dependent on the availability of academic interventions but rather on their quality and level of student participation. On the same note, Shuja (2) reiterates that the academic environment consists of both structural and behavioral factors that determine the learning outcomes. Thus, the quality of tutorials and attendance can be used as moderating variables that can depict the strength of the relationship between tutorial attendance and academic performance.

Although contextual factors including tutorial quality and attendance rate have been extensively implemented in higher education institutions; limited empirical interest has been given to the understanding of how the contextual factors like tutorial quality and attendance rate affect their performance among Health Information Management students in Nigeria. This knowledge gap restricts the capacity to provide a complete explanation of why tutorial programs have unequal academic effects on students, and specifically in special training contexts.

2. Statement of the Problem

Student performance has become one of the most pressing issues of the higher education system, especially in developing countries, such as Nigeria, where the level of student performance remains significantly lower than it should be (1). Despite implementation of tutorial programs in most institutions as an intervention strategy to enhance academic performance, the success of the programs has been inconsistent. In other instances, those

students that attend tutorials continue to report low academic achievement which is a source of concern regarding the quality and delivery of such programs.

One of the most significant concerns is that participation in tutoring may not be as effective as contextual factors like the quality of tutoring provided and the rate of attendance should also be considered as significant contributing factors to the effectiveness of tutoring. Although the impact of tutorials is supposed to improve the learning outcomes, the quality of the instruction and irregular attendance of students can make the impact less effective (5,2). Nevertheless, there is scanty empirical data on whether the quality of tutorials and attendance rates are significant in moderating the relationship between tutorial participation and academic performance among graduates of the Health Information Management program in Nigeria. This gap also restricts the capacity of educators and policymakers to comprehend why tutorial programs have varying effects on students and the ability to design more effective, evidence-based instructional intervention programs.

3. General Objective

To relate the quality of tutorials and attendance rate to tutorial participation and academic performance of Graduates of School of Health Information Management, OAUTHC, Ile-Ife.

Specific Objectives

1. To describe the perceived quality of tutorials among graduates of School of Health Information Management, OAUTHC, Ile-Ife.
2. To explain the attendance rates in tutorial sessions of Graduates of School of Health Information Management, OAUTHC, Ile-Ife.
3. To characterize trends of tutorial attendance, participation and quality of graduates of Graduates of School of Health Information Management, OAUTHC, Ile-Ife.

4. Hypotheses

H 01: There is no significant moderating role of tutorial quality in the relationship between tutorial participation and academic performance.

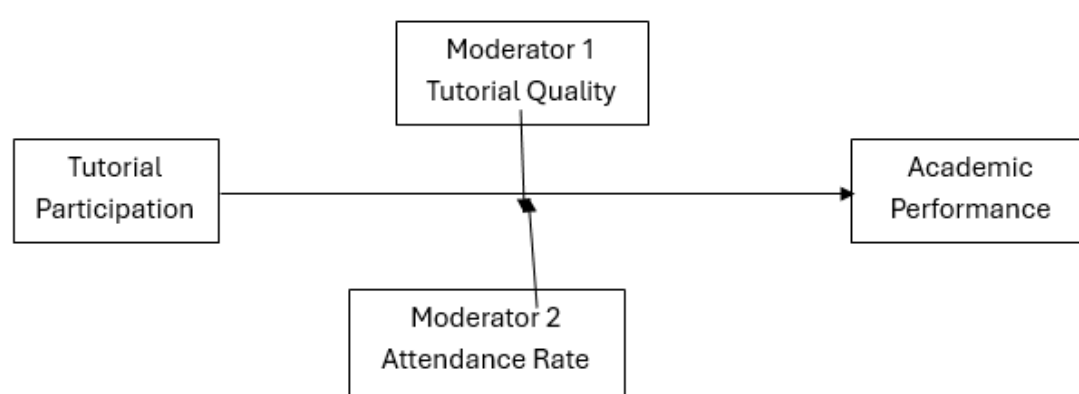
H₀2: Attendance rate does not significantly moderate the relationship between tutorial participation and academic performance.

5. Conceptual Framework

The study is informed by a research framework, which helps to understand the influence of the relationship between tutorial participation (independent variable) and academic

performance (dependent variable) by moderating variables, i.e., tutorial quality and attendance rate.

The framework suggests that the magnitude of the effect of participation in tutorials on academic achievement relies upon the quality of the delivery of tutorials, as well as the regularity of student attendance. Tutorials of high quality, which can be described by the effective teaching techniques and the good skills of the tutors, are likely to contribute to the strengthening of academic achievements, and such inconsistent attendance may undermine the advantages of participating in tutorials (6,7). So the quality of tutorials and the rate of attendance defines the degree to which the students enjoy the tutorial interaction.



Source: Process Macro Model 1

6. Theoretical Framework (Constructivist Theory)

The constructivist theory underlines the fact that learning is influenced by active learning and interaction (8). Ahakiri (9) cites the works of Fosnot (10) and Steffe and Gale (11) who describe learning as a process of creating meaning through experience, but emphasize that prior knowledge and conditions of learning are crucial in knowledge development.

In this research, the quality of the tutorials and the attendance rate are considered as the conditions that impact the effectiveness of constructivist learning. Structured interaction, guidance, and scaffolding within the Zone of Proximal Development are provided by high-quality tutorials and regular attendance. These are the conditions under which students will be able to actively build knowledge and transform the use of tutorials into academic success.

7. METHODS

A cross-sectional design using moderation analysis was used to determine the moderating role of tutorial quality and attendance rate to the relationship between tutorial participation and academic performance.

The population sampled comprised of 81 graduates with a full record of tutorial attendance, quality of the tutorial, and academic performance outcomes.

The entire enumeration sampling method was employed to collect all the qualified subjects. A structured questionnaire that evaluated the quality of the tutors, the competence of the tutor, the effectiveness of the tutor in teaching and the rate of attendance was used to collect data. The quality of the tutorials was measured using a 5-point Likert scale ranging between poor and excellent and attendance was captured on a 4-point Likert scale between rare (<25%), occasional (25-50%), frequent (51-75%), and regular (>75%).

The academic performance data were obtained by institutional records which included pre and post tutorial assessment.

Informed consent and ethical approval was sought before the data collection. The validation of instruments was done using expert review and pilot testing, whereas reliability was checked by using Cronach alpha (≥ 0.70).

The SPSS version 30.0 was used to analyze the data. Moderation analysis was done using PROCESS macro (Model 1), interaction terms were calculated based on tutorial participation x tutorial quality, tutorial participation x attendance rate.

8. RESULTS

Table 1: Socio-Demographical Characteristics of the graduated students of SHIM, OAUTHC, Ile-Ife, Osun State.

Variable	Frequency (n=81)	Percentage (%)	Statistic
Sex			Mean = 1.2346 SD = 0.4547 Chi-Square = 2.188 DF = 3 P = 0.534
Male	14	17.3	
Female	67	82.7	
Age Group			Mean = 1.8272 SD = 0.3805 Chi-Square = 4.907 DF = 6 P = 0.556
18-25	63	77.8	
26-35	17	21.0	
36-45	1	1.2	
Level of Education			Mean = 1.7407 SD = 0.4410 Chi-Square = 11.915 DF = 3 P = 0.008
OND	21	25.9	
HND	60	74.1	
Employment Status			Mean = 1.1013 SD = 0.3036 Chi-Square = 1.354 DF = 3 P = 0.716
Unemployed	71	89.9	
Employed	8	10.1	

Sociodemographic status (mean score $\pm$ SD) = 5.90 ± 1.58

The socio-demographic background of the respondents in Table 1 indicates that a majority of the respondents were female (82.7%), as compared to their male counterparts (17.3%). The sex difference was however not significant ($\chi^2 = 2.188$, $p = 0.534$). Regarding age, most of the respondents were aged between 18 and 25 years (77.8%), then between the ages of 26-35 years of age (21.0%), and only a few respondents were aged 36-45 years of age (1.2%). The difference between the age structure was not significant ($\chi^2 = 4.907$, $p = 0.556$).

In relation to the level of education, the majority of respondents were well-educated with HND qualifications (74.1%), and OND (25.9%). This distribution was observed to be statistically significant ($\chi^2 = 11.915$, $p = 0.008$), which means that there is a significant difference in the educational attainment of respondents. In terms of employment status, most of the respondents were not working (89.9%), with only a minor proportion of the respondents being employed (10.1%). Nevertheless, this difference was not significant ($\chi^2 = 1.354$, $p = 0.716$).

Generally, the results indicate that the respondents were mostly young, female, HND holders, and mostly unemployed, with the educational level being the only socio-demographic variable with a statistically significant difference. Moreover, the general sociodemographic status score was not that low (mean = 5.90 ± 1.58), which means that the distribution of respondents across the measured socio-demographic characteristics is quite homogeneous.

Table 2: To examine tutorial-related characteristics, including tutorial quality, tutor competence, and teaching methods as reported by graduates.

Parameters	Frequency	Percentage
In your own opinion, how do you perceived the quality of tutorial?	3	4.7
I didn't attend tutorials	0	0
Poor	2	3.1
Fair	27	42.2
Good	32	50.0
Excellent		
How knowledgeable were the tutors in the subjects they taught?	0	0
Poor	4	5.0
Fair	30	37.5
Good	46	57.5
Excellent		
How effective were the teaching methods used by the tutors?	0	0
Poor	2	2.5
Fair	43	53.8
Good	35	43.8
Excellent		
Suggestions for improving tutorial delivery. (Open-ended)	13	21.7
Clear Learning Objective	10	16.7

Align with Curriculum	8	13.3
Necessary Equipment and Software Provided	11	18.3
Encourage Group Discussion/Interactive	10	16.7
Adhere to Timetable	5	8.3
Students Friendly Schedule	3	5.0
Rewards for Participation		

These results in Table 2 show that the overall perception of the tutorial programme was of high quality among the graduates. A significant percentage (50.0) of the respondents rated the quality of the tutorial as excellent, with a significant proportion (42.2) of the respondents rating the quality of the tutorial as good and only a negligible percentage of the respondents rated the quality of the tutorial as relatively poor.

Equally, tutors were deemed well versed, with most of the respondents scoring tutor competence as either excellent (57.5%) or good (37.5%), indicating that most tutors have a high level of mastery of their subjects.

Regarding teaching strategies, the approaches were used during tutorials were also considered positive as most of the respondents rated them as good (53.8%) or excellent (43.8%).

In terms of the recommendations on how to improve the situation, the respondents identified the need to have clear learning objectives (21.7%), interactive instructional methods (18.3%), and improved alignment with the curriculum (16.7%), as well as the need to follow the timetable (16.7%), which are the key areas to enhance the efficiency of the tutorial delivery process.

On the whole, the findings indicated that the tutoring sessions were well-organized, well-delivered and guided by competent tutors, but some recommendations were made concerning the organization and the delivery.

9. Test of Hypotheses

Moderation (PROCESS Model 1)

H₀₁: Tutorial quality does not significantly moderate the relationship between tutorial participation and academic performance.

Table 3: Moderation Model Summary.

Model Statistic	Value
R	0.148
R ²	0.022
MSE	0.733
F(3,62)	0.460
p-value	.7115

Table 4: Regression Coefficients (Moderation Model)

Variable	B	SE	T	p-value	95% CI (LLCI, ULCI)
Constant	-1.6062	4.0596	-0.3957	.6937	[-9.7214, 6.5089]
TU PART (X)	0.8486	1.3697	0.6196	.5378	[-1.8893, 3.5866]
TU EFFCT (W)	1.1359	1.2541	0.9057	.3686	[-1.3711, 3.6429]
TU PART $\times$ TU EFFCT (Int 1)	-0.2953	0.4048	-0.7297	.4683	[-1.1045, 0.5138]

Table 5: Interaction Effect. (Moderation Test)

Interaction Term	ΔR^2	F	df1	df2	p-value
TU PART $\times$ TU EFFCT	0.0084	0.5324	1	62	.4683

Hierarchical moderation analysis was used to examine the moderating effect of the quality of tutorials on the relationship between tutorial participation and academic performance.

Overall model fit

The overall moderation model in Table 3 was not statistically significant, $F(3,62) = 0.460$, $p = 0.7115$, and its explanatory power (R^2) was extremely low (0.022). This means that the contribution of tutorial participation, tutorial quality and their interaction between them are able to explain only 2.2 percent of the variation in academic performance; this is negligible.

Interaction effect and main effects.

The findings in Table 4 also revealed that the participation in the tutorials did not significantly predict the academic performance ($B = 0.8486$, $t = 0.6196$, $p = 0.5378$). Likewise, the quality of the tutorials was not a significant predictor of academic performance ($B = 1.1359$, $t = 0.9057$, $p = 0.3686$).

Most importantly, the interaction term between tutorial participation and tutorial quality was not significantly significant ($B = -0.2953$, $t = -0.7297$, $p = 0.4683$), with the confidence interval passing through zero ([-1.1045, 0.5138]). This means that the quality of the tutorials makes no significant difference to the magnitude or inclination of the relationship between tutorial participation and academic performance.

Interaction model test

As shown in Table 5, the interaction term change in explained variance was also not significant ($\Delta R^2 = 0.0084$, $F = 0.5324$, $p = 0.4683$), which supports the fact that there was no significant moderating effect.

According to these results, the quality of tutorials does not significantly mediate between tutorial attendance and academic achievement among graduates of School of Health Information Management, OAUTHC. Therefore, the null hypothesis (H_01) is not rejected.

H₀₂: Attendance rate does not significantly moderate the relationship between tutorial participation and academic performance.

Table 6: Moderation Model Summary. (Attendance)

Model Statistic	Value
R	0.146
R ²	0.021
MSE	0.733
F(3,62)	0.452
p-value	.7166

Table 7: Regression Coefficients

Variable	B	SE	T	p-value	95% CI (LLCI, ULCI)
Constant	0.1451	1.7224	0.0843	.9331	[-3.2979, 3.5881]
TU PART (X)	0.5609	0.7640	0.7341	.4656	[-0.9664, 2.0882]
Attend (W)	0.5938	0.5350	1.1099	.2713	[-0.4756, 1.6631]
TU PART × Attend (Int 1)	-0.1969	0.1983	-0.9932	.3245	[-0.5932, 0.1994]

Table 8: Interaction Effect. (Moderation Test)

Interaction Term	ΔR^2	F	df1	df2	p-value
TU PART × Attend	0.0156	0.9865	1	62	.3245

The moderation analysis was performed to test whether the attendance rate affects the connection between tutorial attendance and academic performance.

Overall model fit

The overall moderation model in Table 6 was not statistically significant ($F(3,62) = 0.452$, $p = 0.7166$) indicating that the joint predictors do not significantly explain the variation in academic performance. According to the model only a very small percentage of the variance was explained ($R^2 = 0.021$) indicating low explanatory power.

Main effects

Table 7 also shows that the individual predictors did not significantly predict academic performance. Tutorial participation ($B = 0.5609$, $p = 0.4656$) and attendance rate ($B = 0.5938$, $p = 0.2713$) both showed non-significant effects, as their p-values were greater than 0.05. Whereas the two variables were positively correlated, these relationships were not significantly different.

Interaction effect (Moderation)

As shown in Table 8, the relationship between tutorial attendance and the rate of tutorial attendance was not statistically significant ($B = -0.1969$, $p = 0.3245$). The change in the explained variance as a result of interaction term was not significant ($\Delta R^2 [\Delta R^2] = 0.0156$) and the interaction effect did not significantly improve the model ($F(1,62) = 0.9865$, $p = 0.3245$). The interaction term (-0.5932 to 0.1994) contains zero, which once again proves that there is no moderating effect.

The results show the attendance rate is not significantly moderating the relationship between tutorial participation and academic performance. Thus, we do not reject the null hypothesis (H_{02}).

10. Qualitative Reports

10.1 Overview of Qualitative Results

Qualitative data analysis on seven focus group discussions revealed that there are two major moderating constructs that affect the relationship between tutorial participation and academic performance, namely: attendance rate and tutorial quality. These factors determined how well students were able to take advantage of tutorial sessions.

Two key themes were developed:

1. Tutorials attendance rate.
2. Perceived Tutorial Quality

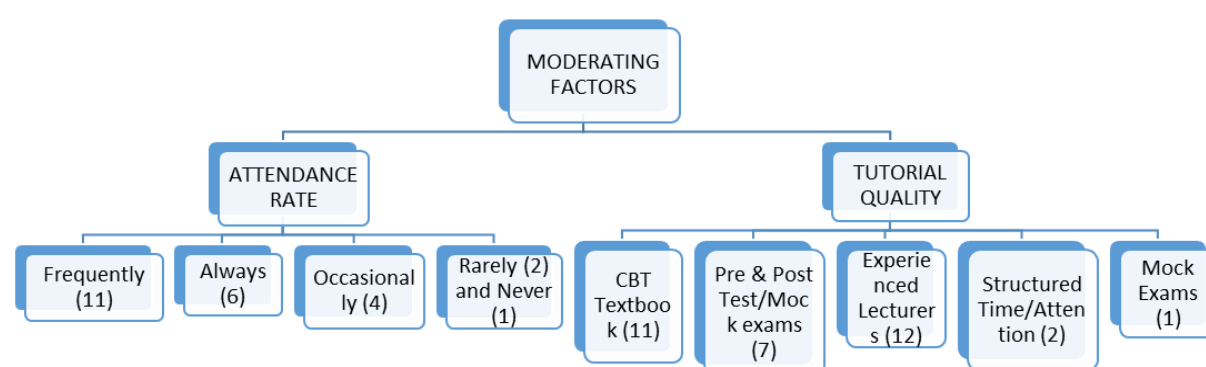


Fig. 1(Theme 1 & 2): Attendance Rate in Tutorial Sessions and Perceived Tutorial Quality

Theme 1: The Percentage of Attendance During Tutorial Session (Narrative Findings).

The results show that the majority of the participants described the high attendance rates of the participants, especially in the category of “frequent” and “always”, which implies that the participants were highly engaged in the tutorial sessions. Participation was also a common

theme among participants who regularly participated in these events. One of the participants mentioned that “attendance helps to answer CBT questions with ease and better preparation to take the exams”, and the other one stated that “frequently attending classes helps to answer the questions on CBT easier and better prepared to take the exams”.

The infrequent and less frequent attendees blamed a workload, excessive tutorial time or time constraints. One of the participants mentioned that they were not attending regularly since it was challenging to attend work and tutorial sessions regularly. Regardless of these differences, the majority of the respondents were in agreement with the fact that the attendance directly influenced the academic performance. According to one respondent, “frequent attendance enables one to discuss more with peers and have a clearer understanding of the difficult issues”.

Theme 2: Perceived Tutorial Quality (Narrative Findings)

The quality of the tutorials was always defined in terms of the competency of the lecturer, teaching materials, systematic instruction, and evaluation practices. Lecturer experience and competence was the most overwhelming factor affecting perceived quality of tutorials. The participants stressed on several occasions that, more experienced lecturers enhanced understanding and preparedness to take exams. One participant mentioned that tutorials were effective due to the presence of experienced lecturers with exposure to licensing exams, and another one stated that lecturers simplify complex matters and make them easier to understand.

The other powerful sub-theme was the utilization of CBT based textbooks and materials especially, the use of the CBT Made Easy textbook. Respondents indicated that these learning materials assisted them in making them up to date with the examination requirements. One of the respondents claimed that “the textbooks on CBT and the past questions helped me to comprehend the exam patterns”. Learning strategies that use assessment including pre-test and post-test activities and mock-examinations were also generally reported. One respondent said that “pre-test and post-test sessions assisted students in recognizing their weaknesses and strengths”, and another said that “mock examinations helped students to prepare themselves to take upcoming CBT examinations”. The less significant but still notable reason was that there was sufficient time and minimal distraction to concentrate on the task. According to one of the participants, “the effectiveness of tutorials could be explained by the fact that they were effectively used thanks to quality time management and the lack of distractions during the sessions”.

11. DISCUSSION

The results of this study show that the conceptually significant contextual variables of tutorial quality and attendance rate do not significantly mediate the relationship between tutorial attendance and academic performance among graduates of the School of Health Information Management, OAUTHC. The quantitative results indicate that both moderation models, i.e. tutorial quality and attendance rate, were not significant and their explanatory power was very low ($R^2 = 0.022$ and $R^2 = 0.021$, respectively). This implies that both the perceived quality of the tutorial delivery and the predictability of attendance had no significant influence to the strength or direction of the relationship between tutorial participation and academic performance. These results contradict theoretical predictions that are based on constructivist and engagement-based learning models, which assume that the outcomes of learning depend on the quality of instruction as well as the participation of students (8,5,2).

Although statistically significant moderation effects were not found, descriptively, it was found that tutorial quality was generally perceived to be high. A high percentage of the respondents had rated tutorial sessions as good or excellent and the tutors were generally considered to be learned and effective in their teaching methods. These results imply that the tutorial programme was conducted in rather favourable teaching conditions. The lack of a marked moderating effect, however, suggests that the high perceived quality in itself might not be enough to affect the outcome of tutorial use on academic achievement. This result contradicts other studies that have found that instructional quality reinforces learning outcomes but is consistent with those that have found that variability in quality among participants can be minimal.

Equally, the attendance rate failed to significantly moderate the relationship between tutorial attendance and academic performance even though it is theoretically related to the increased exposure to learning. The quantitative results indicate that attendance and its interrelation with tutorial attendance were not enough to foretell academic achievement. This implies that the mere increase in attending more tutorials, does not equally translate to the improvement in academic performance within the study context. Such a finding is contrary to earlier studies that focus on the role of constant involvement in academic success (5) but can be attributed to the overall relatively high and homogeneous attendance patterns of the respondents that do not allow variability and reduce the probability of obtaining any significant moderating effects.

The fact that both the moderation models explain the academic performance outcome variable in a weak manner further supports the complexity of academic performance as an

outcome variable. The fact that only a small percentage of the difference in academic performance can be attributed to tutorial participation, tutorial quality, and attendance rate, demonstrates that all of the three factors collectively explain a very small percentage of the difference in academic performance. This helps to argue that academic achievement is not only predetermined by a combination of other factors but is also shaped by a broader range of factors, such as cognitive ability, prior knowledge, learning strategies, and institutional conditions (2). The results thus point to the constriction of using structural and behavioural variables to the academic performance in the special education institution.

The qualitative results, however, are not only important contextual information that supplements the quantitative results, but also offer valuable information on their own. Regular attendance was always highlighted by participants as an effective way to better understand and improve exam preparation, and facilitate peer interaction. Regular attendance was linked to the increased involvement in discussions and the enhanced skills to solve questions based on CBT examination. These results indicate that attendance has a significant role in the experiential level although its statistical moderating impact was not significant. Such a difference between quantitative and qualitative results shows the potential that attendance can affect learning outcomes in a manner not well explained by the statistical model.

In the same manner, quality of tutorials developed to be an important experience issue that affects the effectiveness of learning. The use of CBT-oriented instructional materials, assessment-based teaching strategy including mock examinations, pre-test/post-test exercises were mentioned by the participants as the essential factors of successful tutorials. The utilization of systematic materials such as CBT text books and exposure of exam-oriented teaching methods were especially appreciated to enhance comprehension and exam preparedness. These results can be aligned with constructivist ideas, as they underline the importance of guided instruction, scaffolding, and contextualized learning experiences in the construction of knowledge (10,12,9).

More so, the qualitative data indicate that quality of tutoring and participation might be more of enabling conditions than being issues that moderate academic performance. To give an example, good quality tutorials are a good environment that facilitates learning and regular attendance to tutorials is a guarantee to exposure to such an environment. Nonetheless, the transformation of these conditions into quantifiable academic outcomes can still depend on other individual-level factors like motivation, study habits and cognitive engagement that were considered in other past models but also had limited direct effects. It is this

interrelationship of factors that highlights the multidimensionality of learning and academic achievement.

On the whole, the results indicate that although the quality of tutorials and attendance rate could be considered as important elements in the learning environment, it does not statistically significantly enhance the relationship between tutorial participation and academic performance. The positive perceptions that are highly positive reported in the qualitative findings indicate that these factors play a role in the overall learning experience although their effects could be indirect, context-dependent or mediated through other variables that were not fully addressed in the moderation models. These findings indicate that a more analytical framework is needed to consider the interplay of behavioural, instructional and contextual variables to explain academic performance. They also advise that the improvement of tutorial effectiveness may need a holistic approach which incorporates more than just an improvement in the quality and attendance of tutorials.

12. Theoretical Application

The results of Manuscript 3 may be explained using the constructivist theory, which postulates that a process of learning is optimized through active interaction and social interaction as advanced by Lev Vygotsky (8). The noted effects of quality of tutorials and attendance rate towards academic performance are an indication of the importance of structured learning conditions in the construction of knowledge, as was the views of Catherine Fosnot (10), Leslie Steffe and Jerry Gale (11), who believe that learners construct meaning through guided experience and interaction. Tutorials of high quality gave the chance to scaffold, provide feedback, and clarify the concepts, and regular attendance ensured the continued engagement within the learning environment and allowed students to operate successfully in the Zone of Proximal Development. Moreover, the importance of prior knowledge and learning conditions elucidated by David Jonassen (12) is seen through the fact that students who attended well structured tutorials regularly were able to incorporate the new information with existing cognitive frameworks to enhance academic performance. Nevertheless, attendance discrepancies and differences in the quality of the tutorials must have constrained the level of effective knowledge construction in some of the participants, which caused differences in academic gains.

13. CONCLUSION

The researchers conclude that despite the significance of tutorial quality and attendance rate as important factors of the learning environment, they do not significantly moderate the relationship between tutorial participation and academic performance among graduates in Ile-Ife, Nigeria. Although the overall perception of the quality of tutorials and the relative strength of attendance were relatively high, these variables did not lead to any measurable difference in academic performance in the statistical models. Nevertheless, qualitative results indicate that both variables are significant in the experiential essence of understanding, engagement and exam preparedness. This shows that the academic performance is determined by a more complex and broader interaction of factors other than the participation, quality and attendance of tutorial.

14. RECOMMENDATIONS

1. Institutional Administrators (School Management): To improve integrated academic support systems, to include tutorials with mentoring, study skills training and academic counseling to address multiple determinants of performance.
2. Tutorial Coordinators and Program Designers: Must standardize tutorial formats and strategies of delivery, including clear learning objectives, alignment of curriculum content and consistent application of assessment based strategies such as mock tests and feedback sessions.
3. Tutors/Lecturers: They should consider more interactive and student-centered teaching methods, e.g., problem-based learning, group discussions, real-life case applications etc. to promote higher levels of cognition.
4. Students: Must supplement good use of tutorials with good use of personal study techniques, such as regular revision, active note-taking and collaborating with peers to maximize their learning.
5. Policy Makers and Educational Stakeholders: Must support evidence-based instructional improvements by funding training programs to tutors and promotion of ongoing assessment of tutorial effectiveness across institutions.

15. LIMITATIONS OF THE STUDY

The limitations of the study are that it is cross-sectional and, therefore, the study cannot be used to determine causal relationships among variables. The sample size was relatively small and homogeneous and thus may have minimized variability hence limiting the ability to

detect significant moderation effects. Also, the use of self-reported scales of quality and attendance of tutorials, can be subject to response bias. Lastly, other potential influencing factors like cognitive ability, motivation, and learning strategies were not considered in the study; however these factors may have a greater influence on academic performance.

Other Information

Ethics Approval and Participant Consent

Ethical approval for this study was obtained from the appropriate institutional review authority of Obafemi Awolowo University Teaching Hospitals Complex prior to data collection. Informed consent was obtained from all participating students, ensuring voluntary participation. Strict measures were implemented to maintain confidentiality and anonymity of all respondents, and all procedures were conducted in accordance with established ethical standards for research involving human participants.

Conflict of Interest Statement

Disclosure of conflict of interest: The authors declare that there are no conflicts of interest or competing interests associated with this study.

ACKNOWLEDGEMENT

The authors sincerely acknowledge the Research and Project Committee of the School of Health Information Management, Obafemi Awolowo University Teaching Hospitals Complex, for their constructive feedback and valuable contributions. Appreciation is also extended to the academic staff of the School, particularly Mr. Adesoji Adeniregun, Mr. Lamidi Semiu, Mrs Fawole Oluwayemisi and Mr. Akilo Gbenga, for their guidance and support. The authors further thank the 2024/2025 final year students and all participants across the selected Local Government Areas in Osun State for their time and cooperation in this study.

Author Contribution Statements

OSA conceived the study, initiated the study design, participated in data analysis and coordination, and drafted the manuscript. UTJ contributed to the study design and coordination and critically reviewed the manuscript for intellectual content. MOA also contributed to the study design and coordination and reviewed the manuscript. OJF participated in the study design and coordination and was actively involved in data collection and data analysis. All authors read and approved the final manuscript and agree to be

accountable for all aspects of the work in line with the recommendations of the International Committee of Medical Journal Editors.

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