

# Impact of Teachers' Capacity Building on Students' Academic Performance in Secondary Schools: A Partial Least Square (PLS-SEM) Approach

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**Abstract**--Unarguably, students' academic success rests on the learning experiences derived from their teachers via teaching and learning processes in the classroom. Teachers are an important tool for implementing the school programs to achieve school success. The human capital development is regarded as a way of building the capacity of teachers in the school system, thereby strengthening their knowledge and skills. In the light of this, this study examined the impact of teachers' capacity building on academic performance.

**Index Terms**— Capacity Building, Academic Performance, Structural Equation Modeling, Secondary School

## I. INTRODUCTION

Understanding the concept of capacity building has turned out to be a buzz phrase in education. It's a topic of discourse globally both in developing and developed countries and despite its universal acceptance and wide usage, the concept had been misunderstood virtually by all stakeholders in education [18], [63]. In view of this, there is a need to give definitions of capacity building to give a clear picture of what it entails in the field of education. According to [56] teachers' capacity building can be defined as the systematic process which involves subjecting teachers to intellectual activities purposely designed and meant to develop and updates their knowledge with a view to translate such knowledge to the classroom activities which will have a positive impact on their students. This view is supported by [42] who is of the view that teacher capacity building, which is also known as a teacher development program, is a continuous program aimed at updating the skills and knowledge of the teachers in their chosen field. Capacity building in education system is not something that can be neglected by the stakeholders; rather, it is something that should be done to promote the teaching profession.

Similarly, [23], [29], [46] sees teachers' capacity building as the process whereby the individual teachers undergo training and re-training such as seminar, conference, workshop and lectures for the purpose of making them to be more confident, efficient, and effective in the school system.

Specifically, the capacity building of teachers should be geared towards changes in the classrooms of the school teachers and the changes should be a reflection of what they have gained in terms of new skills, knowledge and positive attitudinal change [59], the new knowledge of the teachers should also come to reflect on students improved performance in the classrooms [23], [56]. The capacity building of the teachers bring positive relationship between the teachers and the students, thus this ensures the efficiency and the effectiveness on part of the teachers in the school [14], [55]. The quality of education depends on the type of teachers that are teaching and this requires training and re-training of teachers in for the growth and development of the education system [48], [50]. Equally important, capacity building can be seen as an enhancement program which is purposely designed to upgrade the skills, knowledge and overall turnaround of the teachers in school, which will in turn contributes positively to the teaching of students in classroom [3], [44]. [53] view capacity building as a planned activities designed in which teachers undergo with the aim of refining them with a view to be competent and proactive in teaching.

## II. LITERATURE REVIEW

Past studies have been conducted on teachers' capacity building and academic performance in school. Specifically, they studied the variable as a uni-dimension which is seen as the correlate of students' academic performance in schools. Though some of the studies conducted in the past found inconsistent results in their various studies. For instance, [34] in their study, worked on the relationship between teacher training and academic achievement in schools in Chicago, USA. Experimental design adopted for the study, the outcome of the findings found low significant relationship between teachers that had undergone training with academic performance of students in secondary schools. The researchers that there was a need for intensive teacher training for them to enable to impart positively on students they are teaching. They recommend that future studies should be conducted on teachers' training and students' academic performance. [30] conducted study on teachers' training and academic performance in school. The outcome of the study found a significant (high) relationship between teachers that are trained and re-trained with academic performance.

In the same vein, [62] based their work on the relationship between professional developments of teachers as a nexus of students' achievement in schools. Three core subjects

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(Mathematics, English language and Biology) were used to measure the academic performance of students. The findings of the study showed a significant relationship (high) between teachers' professional development and academic performance. The researchers are of the view that, teachers with adequate training absolutely would improve the academic performance of their students. Future studies were recommended on the relationship between the two variables used for the study. [47] in his own study, conducted an investigation into the relationship between teachers' capacity building and academic achievement. His study showed a significant (high) relationship between teachers with training programs and students' academic performance. He posits that training of school teachers improves their capability in the classroom. He went further that capacity building programs organized for teachers enhanced their professionalism and makes them better in their chosen work.

Furthermore, [35] explored the relationship between teachers' capacity building and academic performance. The findings of their study confirmed the existence of relationship between building capacity of teachers and academic performance. They went further that teacher capacity training does not only play a big role in the lives of teachers alone, it also has a positive impact on the academic performance of students. Similarly, [30] researched on the relationship between teacher capacity building and academic performance in Texas school. The instrument employed a questionnaire to elicit data from the respondents from the sampled schools. The outcome of the findings revealed positive (high) relationship between the two variables. The study confirmed that teachers with more professional training performed better and had significant impact on academic performance of the students they taught in the school. In the same vein, [61] worked on the relationship between teacher capacity building in group and students' academic performance in schools. Questionnaires were adopted to elicit information from the respondents. Results of students in Mathematics, English language and Science were used to measure the academic performance. The findings of the study revealed that capacity building in the form of group discussions improves the capacity of teachers as well as positively influence the academic performance of students.

[49] in his own work explored the correlation between effective teacher training and students' academic performance. Mixed method techniques were used for the study. An instrument used for the study are the interview and questionnaire. T-test and analysis of variance were used to analyze the data collected from the respondents. The researcher used three subjects namely, Mathematics, Science and Reading to measure the academic performance. It was concluded that teachers with rigorous training tends to be effective and contribute positively to the academic performance of students. [36] in their own study, investigated teachers' workshop on mathematics and its impact on academic performance of students. Their study used an adaptive model for mathematics to teach the teachers. The researchers used the results of student who were under the teachers that had gotten workshop training on mathematics. Their findings revealed positive (high) relationship between the two variables (independent and

dependent variables).

Similarly, [58] investigated the relationship between teacher capacity building (workshop) and students' academic performance. The target population for the study comprised of schools in Georgia, United State of America. The outcome of their findings showed the existence of significant (high) relationship between teacher workshop training and academic performance. They concluded that training of teachers has correlation with academic performance of students. They went further that workshop programs should be provided for all teachers irrespective of their status so as for them to be acquainted with the new ideas and innovations in education. Efforts should be made to research in the future on the relationship between teacher capacity building and academic performance. Likewise, [1] in her research conducted on teachers' development programs in secondary schools in Kwara State, Nigeria. She posited that professional development of teachers makes teachers to be aware of their responsibilities and it increases their job performance in schools. This will change the status in the school and in the society. She furthered that prompt evaluation of teacher development program should be carried out to ensure the type of training that schools are providing for the teachers. In view of the foregoing, therefore, it can be deduced that most studies assessed teachers' capacity as a uni-dimensional variable. Even though teachers' capacity building can be measured by using workshop, training, conference and seminar. Literature has shown that there less focus in using the aforesaid components to measure capacity building. Thus, this study intends to examine whether teachers who had undergone seminar and workshop perform better in the classroom. Also, there is less study on perceived teachers' capacity building in the school. Lastly. This study intends to extend the existing literature by investigating the impact of teachers' capacity building and on students' academic performance in secondary schools, Kwara State, Nigeria.

#### **Research Questions**

1. What is the perception of teachers on capacity building and students' academic performance?
2. Is there any relationship between teachers' participation in seminar and students' academic performance?
3. Is there any relationship between teachers' participation in workshop and students' academic performance?

#### **Research Objectives**

1. To know the perception of teachers on seminar, workshop and academic achievement.
2. To investigate whether teachers' participation in seminar influence students' academic performance.
3. To know the relationship between teachers' participation in workshop and students' academic performance.

#### **Research Hypotheses**

1. There would be a positive relationship between teachers' participation in seminar and students' academic performance.
2. There would be a positive relationship between teachers' participation in workshop and students' academic achievement academic performance.

## Conceptual Framework

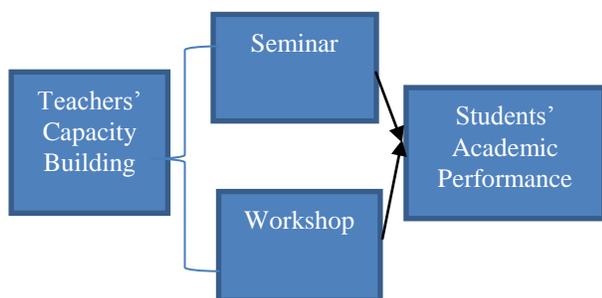


Fig 1: Conceptual Framework of the study.

## Change Theory

Change theory was postulated by John Meyer and colleagues in 1970. This theory is on the need that the more the school desires change, there is a need to take into consideration teachers' development programs for them to adapt to the change the school or organization wants. Change theory is one of the theories used in explaining the need for reform in the education system. This theory assumes that change is inevitable in the education system. The assumption is that, if teachers are trained frequently, the likelihood of those teachers trained teachers performing more than before in the classroom is high [15]. Change theory, which is also known as change knowledge, is typically based on providing the strengths rather than problems for teachers to have expected change. Treating teachers with respect, teachers' empowerment as well as providing continuous assistance or support would minimize the possibility of having negative effects of educational change [15].

## III. METHODOLOGY

### Research Design

This study adopts a correlation survey method to establish the links between constructs of the study. The population for the study consists of all secondary school teachers in Ilorin West Local Government Area of Kwara State, Nigeria. Stratified and cluster sampling techniques were used to select 361 out of 6,237 teachers for the study as suggested by Krejcie and Morgan (1970) sampling table.

### Instrument

The questionnaire used for the study was adapted from the previous studies as contained in the literature review. Questionnaire titled: "Teachers' Capacity Building" (TCB) was used to measure the independent variable of the study. Students' academic performance was measured by using results obtained in three subjects (Mathematics, English and Economics) [2]. The teachers' capacity building questionnaire was specifically used to elicit information from the teachers on capacity building programs provided. Before the administering of the questionnaire, permission was sought from the school principal and explanation were given on the need to conduct this research. The content validity of the questionnaire were done with the assistance of some experts in the School of Education and Modern Languages, Universiti Utara Malaysia, Malaysia. Pilot study was conducted to ascertain the reliability of the instrument adapted for the study. Smart PLS (SEM) software was used to ascertain the average variance extracted (AVE), convergent

validity, discriminant validity and factor loadings of the constructs so as to ensure that the study can be useful for the main data analysis. After that, the main data collected were analyzed using two softwares namely: Statistical Package for Social Sciences (SPSS) and Smart PLS (Version 2) softwares were used to model the relationship among the constructs.

## IV FINDINGS AND DISCUSSION

In this study, the descriptive statistics of the latent constructs were explained in the form of mean and standard deviation for better understanding of the descriptive analysis of the study phenomenon. In order to achieve this, Statistical Package for Social Sciences (SPSS) was used to determine the mean and standard deviation of the constructs. According to [28], the psychometric properties of the study's constructs were measured via a four-point Likert scale (1-4) which was based on strongly disagree to strongly agree. Also, all the items embedded in the constructs were grouped mainly into three categories. The three categories go thus: low, moderate and high respectively. Specifically, a score that is less than 2 (e.g. 3/3+ lowest number 1) is considered as a low score), a score that is that has 3 values (e.g. highest value 4-3/30) is taken as high, while scores between the low and high are considered as moderate. The Table 1 below shows the descriptive statistics of the latent constructs of the study.

TABLE 1  
DESCRIPTIVE STATISTICS OF THE LATENT CONSTRUCTS

Latent Constructs	Mean	Standard Deviation
Seminar	3.056	.319
Workshop	2.345	.321
Academic Performance	3.178	.784

The displayed Table above explains the mean and standard of the constructs which ranged from 2.345 to 3.056 while the standard deviation range from .384 to .985. Meanwhile, in line with the first research question of the study, which is based on teachers' perception of seminar, workshop and students' academic performance in schools. Particularly, the analysis revealed that the mean and standard deviation for seminar (Mean=3.056, Standard Deviation=.319). This means that teachers have a high level perception of seminar in the school. For teachers' perception in workshop (Mean=2.345; Standard Deviation=.321), it shows that teachers have a moderate perception on the level workshop provided for them in the school. For academic per, teachers perceived it as high (Mean=2.793, Standard Deviation=.985), which is good for the development of the school. The charts below shows the perception of teachers on seminar, workshop and academic performance.

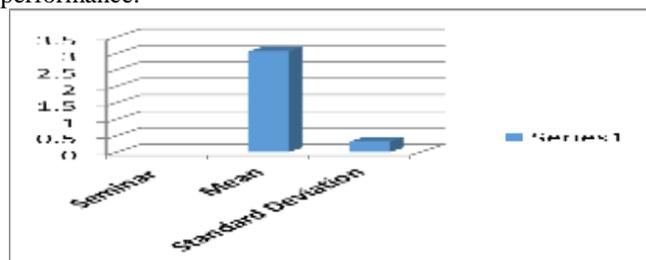


Fig 2: Teachers' Perception on Seminar

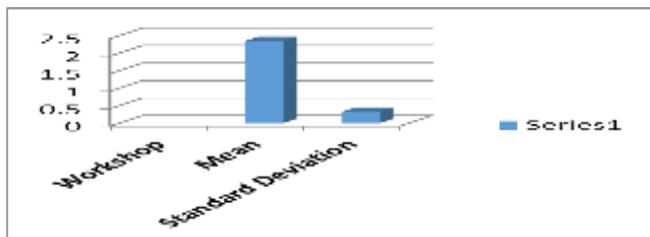


Fig 3: Teachers' Perception on Workshop

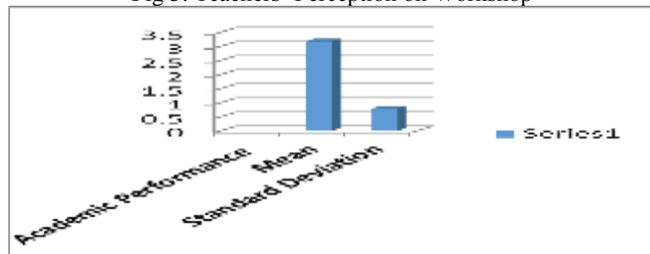


Fig 4: Teachers' perception on students' academic performance.

### Assessment of PLS-SEM Path Model Results

It is essential to make reference to a recent study carried out by [31] who opined that goodness-of-fit (GoF) index is not appropriate for model validation in research [24]. For example, using PLS with simulated data, the researcher explained that goodness-of-fit index is not good enough because it cannot explain valid models from invalid models [27]. In the light of the foregoing about the inappropriateness of PLS model validation, this study thus employed a two-step process to analyse and report the results of PLS, as recommended by [32]. This adopted process consists of (i) the assessment of a measurement model, and (ii) the assessment of a structural model [28], [32].

#### Assessment of Measurement Model

An assessment of a measurement has to do with establishing the individual item reliability, internal consistency reliability, content validity, convergent validity and discriminant validity as suggested by scholars in research [25], [26], [32], [37]. The figure below shows the measurement of the study.

#### Individual Item Reliability

In this present study, we assessed individual item reliability by examining the outside loadings of each construct's measure [28]. Following the rule of thumb for having items with loadings with minimum of .40, it was revealed that out of 21 items, 5 items were deleted and the reason is that they had loadings below the threshold of 0.40. Therefore, in the model, only 16 items were taken as they had loadings between 0.494 and 0.905.

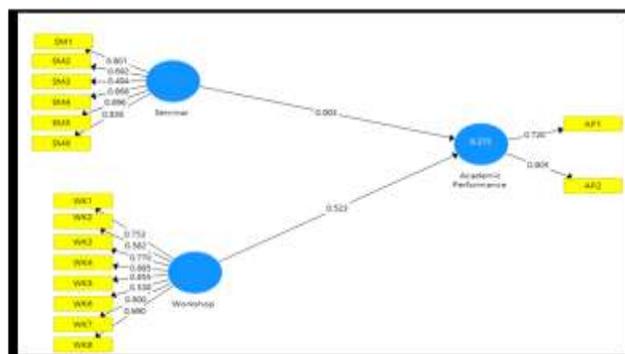


Fig 6: Measurement Model

### Internal Consistency Reliability

Internal consistency reliability can be described as the extent to which all items on a (sub) scale are measuring the same measure or concept [11]. Composite reliability coefficient and Cronbach's alpha coefficient are the most universally used estimators of the internal consistency reliability of in organizational research [7]. In this study, composite reliability coefficient was chosen instead of Cronbach's alpha to ascertain the internal consistency reliability of the adapted instrument. Composite reliability coefficient runs a much less biased estimate of reliability than Cronbach's alpha coefficient simply because the later accepts all items add contribution similarly to its construct without considering the actual contribution of individual loadings [10]. Another reason for choosing composite reliability is that, Cronbach's alpha may over estimate or under-estimate the scale reliability. Composite reliability assumes that indicators have different loadings and can be understood in the same way as Cronbach's. Though, the explanation of internal consistency reliability by using composite reliability coefficient is centered on the rule of thumb as suggested by [8] as well as [26] who recommend that the composite reliability coefficient should load for at least .70 or more. The composite reliability coefficient of each latent constructs in this study ranged from .799 to .906, with each above the minimum acceptable level of .70, signifying adequate internal consistency reliability of the measures used in this study [26].

### Convergent Validity

Convergent validity means the extent or degree to which items really represent the intended construct and definitely correlate with other measures of the same construct [24]. We assessed convergent validity by examining the Average Variance Extracted (AVE) of each of the latent construct, as posited by [22]. To achieve this, [13] mentions that the AVE of each construct should load at .50 or more. Following [13] guidelines, the AVE values in this study revealed high loadings (> .50) on their respective constructs, demonstrating adequate convergent validity. Table 2 below shows the composite reliability and Average Variance Extracted (AVE) of the study.

TABLE II  
COMPOSITE RELIABILITY AND AVERAGE VARIANCE EXTRACTED

Constructs	Cronbach's Alpha	Composite Reliability	(AVE)
Students' Academic Performance	0.852	0.799	0.668
Seminar	0.863	0.898	0.604
Workshop	0.887	0.906	0.552

**Discriminant Validity**

This refers to the extent or degree to which a specific latent construct is dissimilar from other latent constructs [17]. In this study, discriminant validity was determined by using Average Variance Extracted (AVE), as recommended by [22]. We thereby compared the relationships among the latent constructs with square roots of AVE [22]. Further, discriminant validity was determined in line with [13] standard by comparing the pointer loadings with other indicators in the crossloadings. The Tables 3 and 4 below explains the discriminant validity and crossloadings of the study.

TABLE III DISCRIMINANT VALIDITY

Constructs	Students' Academic Performance	Seminar	Workshop
Students' Academic Performance	0.817		
Seminar	0.313	0.777	
Workshop	0.525	0.592	0.743

Note: Entries shown in yellow face represent the square root of the average variance extracted.

TABLE IV CROSSLOADINGS

Constructs	Academic Performance	Seminar	Workshop
AP1	0.720	0.002	0.316
AP2	0.905	0.419	0.512
SM1	0.157	0.801	0.413
SM2	0.190	0.692	0.315
SM3	0.200	0.494	0.339
SM4	0.283	0.868	0.248
SM5	0.348	0.896	0.467
SM6	0.152	0.836	0.360
WK1	0.221	0.497	0.753
WK2	0.184	0.300	0.582
WK3	0.408	0.473	0.770
WK4	0.352	0.423	0.885
WK5	0.201	0.301	0.855
WK6	0.257	0.120	0.538
WK7	0.228	0.435	0.800
WK8	0.221	0.240	0.690

**Assessment of Significance of the Structural Model**

Having ascertained the measurement model, the next thing was the assessment of the structural model. Before that, we applied the normal bootstrapping process with a number to assess the significance of the model [25], [26], [28], [32].

Therefore, Figure 7 shows the estimates for the full structural model.

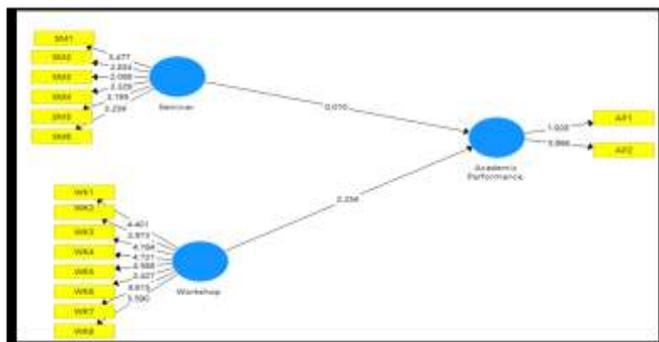


Fig 7 Structural Model

TABLE V STRUCTURAL MODEL ASSESSMENT

	Original Sample	Sample Mean	Standard Deviation	T Statistics	P Value	Decision
Seminar – Academic Performance	0.003	0.140	0.278	0.010	0.992	Not Supported
Workshop – Academic Performance	0.523	0.480	0.232	2.254	0.025	Supported

However, concerning the research question 2, it was whether teachers' training (seminar) programme influence students' academic performance. In answering this question, we hypothesized that teachers' seminar programme is positively related to students' academic performance. Result in Table 5 and Figure revealed a negative relationship between teachers' seminar programme and students' academic performance in school ( $\beta = -0.03$ ,  $t = 0.010$ ,  $p > 0.05$ ), thereby rejecting the hypothesis. Going by this result, it shows that teachers who had undergone training (seminar) does not translate to positive academic performance on the part of their students they teach in the classroom. This finding is congruent with the findings of [5], [52] who found that students' academic performance is not totally depend on the training that teachers had acquired through various development programmes, it depends on students' self-motivational factor such as self-efficacy, attentiveness, and intellectual ability.

On research question 3, it was whether teachers' training (workshop) programme influence students' academic performance in school. In response to this question, the second hypothesis stated that, teachers' workshop programme is positively related to students' academic performance. Interestingly, PLS path modelling results indicates that teachers' workshop programme is positively related to students' academic performance in school ( $\beta = 0.523$ ,  $t = 2.254$ ,  $p < 0.025$ ), thereby confirming the predicted hypothesis. This results means that teachers who had acquired workshop programmes are more equipped and thus have the intellectual capacity to impact adequate knowledge on their students in the classroom which will in turn have positive influence on students' academic performance. This finding is consonance with the findings of [14], [55], [58] who found that teacher s' development is important for the development on one part, and for the success of the students on the other part. Updating

teachers' knowledge is akin to achieving academic excellence, therefore training and re-training of teachers is sacrosanct. Also, this finding has validated change theory, who postulated that providing capacity building for teachers help them to better in the classroom since change is constant, teachers need to be updated from time to time for them to have knowledge of 21<sup>st</sup> century as well as compete favorably with their foregoing counterpart. Furthermore, this study has contributed to the body of knowledge from three perspectives, namely practical, theoretical and methodological perspectives.

From practical perspective, this study would serve as a model on how to provide teachers' capacity building in secondary schools. Specifically, it would help school administrators as wells government on how to provide capacity building for its teachers. More so, relevant literatures shows that change theory is a well-established theory that helps to understand the importance of teachers' capacity building in school, thus change theory was included in this study for better understanding of the study phenomenon. Methodological perspective, a broad review of the literature shows relationship between teachers' capacity building and academic performance were mainly analyzed with SPSS, therefore this study contributes to the body of knowledge by analyzing the data collected through a sophisticated software PLS-SEM, which helps to show the aesthetic beauty of the study model.

#### V. CONCLUSION

In conclusion, this study concluded that training and re-training of teachers is an essential factor for determining students' success and its importance cannot be over-emphasized, hence the need for capacity building for teachers in secondary schools. Therefore, capacity building should be constantly provided for teachers with a view to boost their morale and make them efficient and effective. Improved budgetary allocations should be made by government for teachers to attend various capacity building programs. Private and individuals should be involved in providing capacity building for teachers. Lastly, no teacher should be left out in capacity building programs as teachers remain the bedrock to students' success.

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