

The Moderating Effect of Principals' Supervision on the Relationship between Students' Personnel Services and Academic Achievement in Schools: A Preliminary Report Using Partial Least Square (PLS-SEM) Approach

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Abstract - This study examines the role of principals' supervision on the relationship between students' personnel services and academic achievement in secondary schools in Kwara State, Nigeria. The aim of this study is to explain the research model, research hypotheses and the results of the preliminary findings on the nexus between student personnel services and academic achievement. To know the initial findings of the study, the authors conduct a pilot study to (or "intending to") know whether it will be suitable for the main study or not. Two sources of data (i.e., primary and secondary) are used for the study. Questionnaires are distributed to 50 students in one of the secondary schools in Kwara State that is chosen for the study. Also, students' results are obtained from the school to determine their academic achievement in school. Two softwares namely, Statistical Package for Social Sciences (SPSS) and Partial Least Square (PLS-SEM) are used to assess the measurement model of the study. Individual items' reliability of the constructs and discriminant validity are assessed. In conclusion, the preliminary results indicate that the instrument used for the study is valid and reliable; thus, the findings of the paper demonstrates the potency for conducting the comprehensive study on the impact of principals' supervision on the nexus between student personnel services and academic achievement in secondary schools.

Keywords: Principals' Supervision, Students' Personnel Services, Academic Achievement, Secondary School, Research Model

INTRODUCTION

Education is the process of cultural transmission and renewal from one generation to another generation. It is a tool for self-reliance in the society. It is often described as a long-term investment that can bring both monetary and non-monetary returns. It is believed that the provision of quality education is akin to the eradication of ills and poverty in the society. School is regarded as a place where the teaching and learning take place. It is a place where school programs are implemented for the overall success of the students [23].

Academic achievement is regarded as an important measure for determining students' academic achievement in the school system. Academic achievement is a parameter for measuring the success of students in the classroom. The achievement depicts whether the school's objectives are achieved or not. In realizing the goals above, student personnel services are vital to the smooth running of the school programs [6].

Furthermore, past studies have shown that the performance of students in secondary schools in Nigeria is worrisome. The results of the students in examinations reveal that 31% of the students obtains

five (5) credits and above under English Language and Mathematics while 69% fail to obtain. The abysmal academic achievement of students in secondary schools made concerns stakeholders in education to raise some fundamental questions about why students' performance is low in recent years as shown in the results released by the examination bodies. The stakeholders are of the view that if this trend continues this way, it could further compound to the falling standard of education in Nigeria. Apart from that, the implication of the trend is that some of the students would not be able to get admission into higher institutions of learning. Furthermore, questions are raised about whether the dismal performance could be as a result of the lack or inadequate facilities in the school system [2].

According to Lewis (37), student personnel services is an important aspect of the school system. The services are needed for students' development to enhancing their academic achievement. These services are sometimes regarded as one of the key inputs to the school system [37]. The success or failure of students rests on the provision of the services in the school. Apart from providing school services, it requires proper implementation of the services which are the functions of the school principal [43, 58].

Principals' supervision is essential for the smooth running of the school programs, and it is often called as an internal supervision in the school system as described by Igan [32] Kotirde and Yunos [34], Langa and Medugu [35] and Mette and Sugu [40].

There are various definitions of student personnel services as explained by different scholars in the field of education. According to Hyde and More [31], students' personnel services means the essential services that are needed for the overall development of students in the school system. The services are closely associated with the content of the school curriculum. Dukes and Lamar-Dukes [17] describes student services as the services that are designed for the implementation of school programs with a view to stimulating teaching and learning activities in the school system.

On the essence of student services in the school system, Lewis (37) opines that the school provides services for students so as to satisfy their needs which will enable them to excel in their academic pursuits. Thus, the presence of the services is akin to students' academic success while the absence of the services often leads to failure of the students in schools. Holcomb-McCoy [30] is of the view that basically,

there are common school services that are prominent in the school system. Now-a-days, the services are guidance, library, accommodation, health, admission services, extracurricular services, transportation services, food services, orientation services, etc. Even though student services are comprehensive in nature, the level of provision in the school system depends on the capability of the school in making it available for the students.

Concerning the importance of student services in the school system, Lewis [37] explains that students' services promote teaching and learning in the school classrooms, and it improves the academic achievement of the students in their examinations. Also, it promotes the image in good light and raises the status of the school positively.

LITERATURE REVIEW

Students' personnel services are an integral part of the school system. Prevalent literatures have established a link between student personnel services and academic achievement [37]. Specifically, those studies have investigated one dimension of students' personnel services as a correlate of academic attainment in the school system even though those studies have found a conflicting results in their studies [11, 41, 45, 59], and this necessitates the need for the present study to examine students' personnel services from broader perspectives.

Therefore, the nexus between five dimensions of students' services and academic achievement is reviewed, and they are as follows:

Relationship between Admission Services and Academic Achievement

Several studies have justified the importance of admission services in the education system [1], and those studies assert that it is an indispensable service in the school system which other services rely on to achieve success [3, 49].

Specifically, on the relationship between admission services and academic achievement of students in school, Juradja and Munich [33] have carried out a study on the link between admission and academic achievement, and they have found that students who pass through examination and interview processes do well in their examinations. They concur that the provision of admission services is an ingredient to students' success. In the same vein, Sacket et al., [49] have researched on the impact of admission services on students' academic success.

The outcome of their study revealed that admission services play a significant role determining whom to be selected for admission. Admission services, to some extent, influence the academic success of the students. In support of this, Albanese et al., [3] have found a positive relationship between school admission process and students' academic achievement. On the contrary, Fan et al., [21] have found a negative relationship between admission and students' academic achievement. Those studies that have positive findings are more than negative ones; therefore, this study proposes that:

H1: There would be a positive relationship between admission services and academic achievement in secondary schools

Guidance and Counselling Services and Academic Achievement

Scholars (36, 41, 63) have described guidance and counselling services as vital services that are needed for the smooth implementation of the school programs. The services are necessary to solve the numerous challenges that are faced by the students in the school.

On the nexus between guidance and counselling services and academic achievement, the study conducted by Mudo et al., [41], show that there is guidance services which works as a way of improving students' academic achievement. The outcome of their study has revealed that school guidance services is synonymous with the academic success of the students. They posit that the purpose of counselling services is to show the students the pathway concerning their career and other areas that students need to be counselled.

Likewise, Lapan and Gysber [36] have found that the provision of counselling services in the school cannot be compromised because it is one of the fundamental services that is needed for the overall development of the students towards achieving success. Also, White and Edmonson [63] are of the view that counselling services should be paramount in the mind of the school administrators as it is an essential input in the school system. Dwyer and McNaughton [18] and Turball [57] have confirmed in their studies that effective implementation of school guidance and counselling programs influences the academic performance of students. On the contrary, Troop and Tyson [56] have found a negative relationship between the two variables of the study. In the light of this, this study postulates that:

H2: There would be a significant relationship between guidance and counselling services and academic achievement in secondary schools.

Relationship between Extracurricular Services and Academic Achievement

According to Bradley et al., [11], school curriculum is structured into three major domains of learning (i.e., affective, cognitive, and psychomotor). Specifically, the implementation of the psychomotor domain of learning is anchored on the availability of extracurricular services that are provided in the school system. Pitts [47] asserts that extracurricular services is purposely meant for students' social and other activities which are done outside the classroom.

Concerning the relationship between extracurricular services and students' academic achievement, Donnelly's [16] study have found that students who often participate in various extracurricular activities (i.e., football, basketball, etc.) perform well in their examinations. Mcaughn's [39] study has revealed a significant relationship between extracurricular activities and students' academic success. He has concluded that engagement of students in social activities, such as school debates, quiz competitions and other social events stimulate the influence of the academic achievement of students because of the knowledge acquired in those activities. Similarly, Tore [55] has found a positive relationship between students' engagement in sporting events and academic performance. Therefore, this study postulates that:

H3: There would be a positive relationship between extracurricular services and academic achievement in secondary schools.

Health Services and Academic Achievement

Health services is seen as one of the dimensions of student personnel services in the school system. The health related issues in the society call for the need for the establishment of health services with a view to attending the health requirements of the students [37, 38].

Regarding the correlation between school health services and academic achievement, Cooper [14] has conducted a study on the relationship between the provision of health services and its impact on students' academic achievement in secondary schools. The outcome of the study shows that health services is closely associated with the school achieving students. He has explained that students in good health condition would be able to withstand academic

activities in the classroom, thereby, they will have a positive impact on his/her academic success.

Lewis [37] investigated the link between health fitness and students' academic performance in secondary schools. Their study revealed a positive relationship between the variables. In support of this, Wayne et al., [61, 62] have found a significant relationship between health services and academic achievement. They are of the view that 'health is wealth' and its impact cannot be underestimated in the school system. However, some authors have found that the provision of health services in the school system do not guarantee students' success [60, 59]. In the light of this, therefore, this study postulates that:

H4: There would be a positive relationship between health services and academic achievement in secondary schools.

Relationship Library Services and Academic Achievement

The library is an essential service in the school system; this is applicable to all levels of the education system. Farmer [22] has opined that the provision of school library accelerates the implementation of the school programmes. It is a place where students and teachers can have access to relevant materials for their educational needs. The school is said to be incomplete without the establishment of the school library. Stone and Ramsden [53] explain that the school library should be conducive for students' use. It should store the relevant materials that cover a variety of subjects in all disciplines.

On the association between school library services and academic achievement, Scott and Plourde [50] examine the school library and students' performance in secondary schools. The outcome of the study shows a positive relationship between the two. They conclude that the impact of the school library in achieving school success could not be underestimated. Lewis [37] conducts a study on the links between the use of library and students' academic achievement. The finding establishes that library stimulates students to read, and this has positive effects on their performance in the classroom.

Similarly, scholars such as Farmer [22] and Goodall and Pattern [25] also have found similar findings on the significance of library services on students' academic achievement in the school system. On the contrary, Anderson and Mathews [4] have found a negative relationship between library services and academic achievement. He concludes that the

provision of the library services does actually guarantee students' success in school. Given the preceding, the study proposes that:

H5: There would be a positive relationship between library services and academic achievement in secondary schools.

In summary, it can be said that previous studies have established that students' personnel services is the cornerstone to the success of the school programs. Particularly, the aspects of students' personnel services discussed in this present study (i.e, admission, extracurricular, guidance and counselling, health and library services) are crucial to the attainment of students' academic achievement.

The findings from the literatures reveal mixed findings on the relationship between five dimensions of students' personal services and academic achievement.

Particularly, some studies have found a positive relationship between some dimensions of the services and academic achievement while other studies have found that school services is not a predictor of students' academic achievement. In view of this, thus, this study seeks to see whether similar findings would be established or not.

The Role of Principal's Supervision in the School System

According to Baron and Kenny [7], moderating variable serves as a variable that changes the strength or direction nexus between the predictor and the criterion constructs. Similarly, the moderating construct in research is regarded as a construct that has the potential to moderate positively on the relationship between independent and dependent variables. Thus, the inclusion of the moderator changes the direct link between the independent and dependent variables [51].

In order to justify the inclusion of principals' supervision as a potential moderator, the assumption of prior empirical studies and theories according to Ayeni [6], Bormman [10], Gwam [26] and Powell [48] has established the potentiality of principal's supervision in the school system. Specifically, Ayeni [6] explains that the school principals' principle is the alpha and omega of the school. The role of the Principal is a well-established rank which ensures a supervisory role by coordinating the school programs (i.e., curricular and extracurricular activities) and is responsible for the overall administration of the school system. The school principal, being the leader of the

school, is at the vantage capacity to monitor, supervise, evaluate, disseminate and assess the school inputs so as to achieve the educational goals and objectives. Bormann [10] is of the view that supervision is an inner mechanism that embraces the school principals for self-evaluation, which is geared towards assisting students in their learning activities with the aim of achieving academic achievement.

According to Onuma [43], effective supervision on the part of the school principal aims to interact socially and academically with students and teachers within the school system. The cardinal aim of principal's supervision is to ensure proper supervision of all the school programs which bring out the positive outcome in students.

Additionally, the impact of principal's supervision in the school can be explained from the theoretical point of view. The theories are known as model agency theory of supervision, leadership theory, and the social exchange theory. Firstly, according to the model agency theory of supervision, the school supervision of the principal is based on effective supervision, which is normally based on trust between the principal and staff in the school system [48]. When such a situation prevails, it enables the school to achieve its goals [48].

Likewise, leadership theory is based on the notion that there are certain leadership styles which a leader can employ to lead the subordinates in the organization. The styles are democratic and bureaucratic styles [29]. The former, which is democratic is described as the best style which a leader can use to achieve the set objectives in the organization [28]. In the same vein, social exchange theory postulates that acceding to subordinates welfare gingers them to work harder; thus, it helps achieve the objectives of the organization [20].

Given the empirical and theoretical evidence of the potentiality of principal's supervision, it is therefore incorporated to be a strong variable that could strengthen the relationship between student personnel services and academic achievement in secondary schools. Its often aid that the impact of principal's supervision cannot be underrated, hence there is a need for supervision in the school system.

Taken together, this study believes that principal's supervision could positively influence the relationship between students' personnel services and academic achievement.

Therefore, the following hypotheses are formulated to guide the study:

H6: Principal's supervision will moderate the relationship between admission services and academic achievement in secondary school.

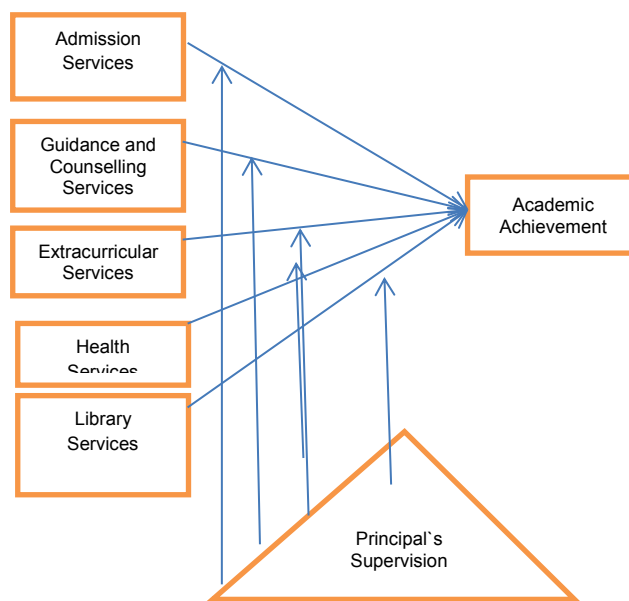
H7: Principal's supervision will moderate the relationship between extracurricular services and academic achievement in secondary schools.

H8: Principal's supervision will moderate the relationship between guidance and counselling services and academic achievement in secondary schools.

H9: Principal's supervision will moderate the relationship between health services and academic achievement in secondary schools.

H10: Principal's supervision will moderate the relationship between library services and academic achievement in secondary schools.

Given the above hypotheses formulated, the study's proposed conceptual framework is displayed below:



MATERIALS AND METHODS

The research design for this study is a survey method which is a known method of research in quantitative studies. It is important to note that in the pilot study, a small number of respondents are recommended to test-run the instrument adopted for the study. Specifically, the recommended sample size for conducting a pilot study ranges from 30-100 as recommended [51]. Primarily, the importance of conducting a pilot study is to ensure the reliability and reliability of the items with a view to know whether it would be useful for the main study or not [51]. Therefore, it makes the researcher to foresee the likelihood of inconsistencies in the research design

adopted for the study, which enables the researcher to make amendments where necessary before conducting the main study. Precisely, the two sacrosanct areas that will be reported in this study are the reliability and validity of the instrument. According to Hair et al., [27], the reliability of the instrument encompasses the extent to which a test, experiment, or any procedure measure adopted yields similar results repeatedly. The propensity towards consistency when repeated is called reliability. Validity refers to degree or extent to which an instrument measure what is supposed to measure.

In view of the above submission, this study carries out a pilot study concerning the moderating effect of principal's supervision on the relationship between student personnel services and academic achievement in secondary schools in Kwara State, Nigeria. A total of 50 senior secondary school students is selected in one of the secondary schools in Kwara State for the pilot study. This study adopts two sources of data for the study, namely primary and secondary data (Sekaran, Robert & Brain, 2001). For primary data, structured questionnaire titled: Students' Personnel Services Questionnaire (SPSQ) is used to elicit data for the moderating and independent variables (i.e., principal's supervision and student personnel services), while secondary data (i.e., students' results in five subjects) is used to measure the academic achievement of students. The distributed questionnaires are collected and used to for the preliminary findings of the study.

PRELIMINARY FINDINGS

A PLS-SEM (Partial Least Square) software version 2.0 was employed to analyze the pilot study data collected from the respondents. The software is a structural equation modelling which is currently in vogue for analyzing a multivariate study. The reason for using the software is that it can run data analysis with a small sample size [12]. Also, it can run data of multivariate variables at once. Before using the PLS software, Statistical Package for Social Science (SPSS) is used to screen the data collected before importing it to PLS software.

Reliability and Validity Assessment of the Instrument

The items adapted for this study are taken from the previous studies based on the constructs of the study. The original items are purified to suit the context of the present study; this is done by removing some irrelevant items and adding relevant items to the

items. The table below shows the instrument and its sources adapted for the present study.

Table 1. Variable Measurement and Sources

S/N	Constructs	Sources	Remarks
1	Principal's Supervision	Ayeni (2012)	Adapted
2	Admission Services	Adnett et al. (2011)	Adapted
3	Extracurricular Services	Mc Caughn (1999)	Adapted
4	Guidance and Counselling Services	Parsad et al., (2003) & Nyamwangeet al., (2012)	Adapted
5	Health services	Toma et al., (2014)	Adapted
6	Library services	Arinde (2010) & Owate and Iroha (2013)	Adapted

To know the measurement accuracy of the data collected, PLS software is used to assess the validity and reliability of the study items. As said earlier that validity refers to the degree of what instrument measure what is supposed to measure, the validity of the constructs of the study reflects the accuracy of what they are expected to measure while reliability has to do with the reliability of the items contained in the constructs. Some criteria are adopted to determine the validity of the constructs; they are convergent and discriminant validity as well as content validity. The content validity is done by giving the questionnaires to experts in the field of the study for the corrections of the items contained in the questionnaire before conducting the pilot test, particularly, supervisors of the researcher and some lecturers from the School of Education and Modern Languages, University Utara Malaysia. Their corrections and suggestions are integrated into the questionnaire as the final draft of the pilot study.

For convergent and discriminant validity, Tore [55] opines that the convergence and discriminant validity seek to show the agreement between an instrument and theory by knowing whether the instrument measures the true pictures of the attributes. Hair et al., [27] postulates that factor loadings, average, variance extracted (AVE) and composite reliability is yardsticks that are used in determining his convergence validity. Thus, according to Bollen and Lennox [9], if there is a known correlation between all the items that measure the constructs, convergent validity has been determined.

Table 2. Cross Loadings

	AA	AS	ES	GS	HS	LS	PS
AA1	0.584457	0.147498	0.392586	0.296197	0.262135	0.183029	0.067348
AA2	0.81949	0.374413	0.504069	0.383513	0.480316	0.378884	0.374368
AA3	0.800054	0.342167	0.560441	0.408455	0.103154	0.230748	0.451625
AS 1	0.257663	0.7093	0.279023	0.299187	0.152246	0.264546	0.209198
AS 2	0.312373	0.58779	-0.010573	0.387566	0.290683	0.580374	0.250906
AS3	0.332037	0.637069	0.335781	0.350304	0.248703	0.192348	0.366824
AS4	0.281045	0.884553	0.288419	0.263454	0.248273	0.297607	0.258623
AS5	0.281045	0.884553	0.288419	0.263454	0.248273	0.297607	0.258623
ES1	0.467414	0.377234	0.704019	0.185175	0.382135	0.244228	0.391549
ES2	0.518692	0.288662	0.751245	0.199319	0.19564	0.123867	0.208827
ES3	0.49398	0.052639	0.784091	0.105813	0.309011	0.113552	0.384987
GS1	0.41503	0.271787	0.110165	0.858252	0.327385	0.30022	0.415691
GS2	0.3388	0.373022	0.073865	0.698365	0.024576	0.307506	0.446913
GS3	0.368155	0.43784	0.169374	0.81143	0.434501	0.514716	0.407507
GS4	0.294102	0.148379	0.315833	0.477598	0.335477	0.068982	0.323859
HS1	0.20834	0.25345	0.375276	0.264987	0.68073	0.198083	0.294895
HS2	0.340844	0.297014	0.26222	0.387133	0.807203	0.289471	0.416703
HS3	0.25157	0.165192	0.262595	0.182549	0.716202	0.35886	0.188459
LS1	0.209351	0.381526	0.20527	0.429249	0.320933	0.530001	0.441633
LS2	0.382315	0.305936	0.128951	0.32391	0.271841	0.881788	0.164321
LS3	0.242071	0.475039	-0.008731	0.370525	0.334378	0.809318	0.144834
LS4	0.213718	0.082565	0.436129	-0.012374	0.205132	0.577681	0.027343
LS5	0.172768	0.416532	0.040619	0.468112	0.29119	0.755662	0.24446
PS1	0.215591	0.362796	0.31495	0.415216	0.460998	0.365882	0.636153
PS2	0.402487	0.25845	0.312975	0.426352	0.281952	0.220076	0.815246
PS3	0.253787	0.215191	0.329602	0.356553	0.216568	0.007053	0.678523

To know the problems with any of the items, loadings and cross-loadings of the items are assessed respectively as displayed in Table 2. Thus, it shows the cross loading of items in their constructs. A good measurement model scale is said to display convergent validity when all the indicators/item loadings are above the threshold of 0.5 on their related constructs, such that no items load higher on other study constructs than that of their real constructs that they are to measure [27]. In this pilot study analysis, all the items contained in the study are adequately loaded on their constructs respectively in such a way that they are loaded more than the required threshold of 0.5 as recommended by Hair et al., [27]. As displayed in Table 2, the entire items are well loaded on their constructs.

The convergent validity is determined by using the average variance extracted (AVE). In line with Fornell and Larcker's [24] recommendation, for the construct to reflect the convergent validity, the AVE should reach the threshold of 0.5 or above. This means that the variance explained of the constructs more than the error measurement. Also, the average variance extracted explains the average shared between a construct as well as its measures. In consonance with

Couchman and Fulop's [15] suggestion, the average variance extracted of a construct should be more than the variance that is shared between the particular construct and other constructs in a study. In this study, all average variance extracted (AVE) of all the constructs exceed the benchmark of 0.5, with 0.55108 as the lowest as displayed in Table 3. This shows that the convergent validity is adequate in this study. Moreover, this result shows a satisfactory composite reliability, item loadings, and average variance extracted elements for the individual items. The result has proven that there is evidence that the indicators/items truly represent their constructs, which give other empirical evidence of convergent validity.

Table 3 Convergent and Reliability Analysis

Latent Variables	AVE	Composite Reliability
Academic Achievement	0.55108	0.782934
Admission Services	0.563866	0.862806
Extracurricular Services	0.55827	0.790976
Guidance and Counseling Services	0.527707	0.810834
Health Services	0.542638	0.779772
Library Services	0.523638	0.841381
Principal's Supervision	0.509903	0.755231

Table 4. Discriminant Validity (The Correlation Matrix of the Constructs)

	AA	AS	ES	GS	HS	LS	PS
Academic Achievement	0.74						
Admission Services	0.40	0.75					
Extracurricular Services	0.66	0.32	0.75				
Guidance and Counselling Services	0.49	0.43	0.22	0.73			
Health Services	0.37	0.33	0.39	0.39	0.74		
Library Services	0.36	0.45	0.21	0.42	0.39	0.72	
Principal's Supervision	0.43	0.37	0.44	0.55	0.42	0.27	0.71

Note: Diagonal values in bold represent the AVE (average variance extracted) while the other entries represent the squared correlations of the latent variables

Furthermore, as displayed below in Table 4, the results of the analysis establishes discriminant validity, as their items/indicators are loaded better on their constructs respectively more than other constructs. It has clearly shown that discriminant validity measures those that are not supposed to be linked with, actually, are linked. To determine the discriminant validity, the square root of the average variance extracted (AVE) of the constructs is used. Thus, the square roots of the average variance extracted coefficients are used to substitute the correlation matrix which goes along the diagonal as suggested by Fornell and Lacker [24]. Normally, the AVE squared (i.e., the diagonal coefficient) is anticipated to be more than the off-diagonal elements or the coefficients in the corresponding columns and rows [27].

As shown in Table 4, diagonal elements reveal the square roots of the average variance extracted (AVE) for all the study's constructs, meaning that the constructs are well discriminated. Therefore, an indication of discriminant validity is established in this study since all the average variance extracted (AVE) square roots of the entire constructs along the diagonals are greater than the corresponding off-diagonal elements both in columns and rows. The results showed in Tables 2, 3 and 4 demonstrate that the items for all the seven constructs accurately measure their constructs respectively, given their parameter estimates and their statistical significance [13]. Thus, the purpose of this study, which is to validate the validity and reliability of the instruments have been achieved.

CONCLUSION

In conclusion, it can be said that the contribution of this pilot study is that it established the research framework of the study and described the links among the exogenous variables as well as the endogenous

variable. It shows the potency of the variables regarding their reliability and validity of the instruments adapted, which are to be used in the main study. The PLS analysis results reveal that the adopted items are robust in measuring the study's constructs they are to measure, most especially to consider the fact that the benchmark set for composite reliability, the average variance extracted, and standardized cross loadings.

Particularly, the convergent and discriminant validity conducted shows that the study's constructs are valid. Therefore, it means that the adopted instruments are reliable and demonstrates strong evidence that it can be used to conduct the main study on the moderating effect of principal's supervision on the relationship between student personnel services and academic achievement.

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