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# Evaluation of the Teaching Quality Model and its Relationship with Students' Academic Performance through Partial Least Squares-Structural Equation Model

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***Abstract:*** ***Many institutes of higher learning (IHL) globally has implemented student evaluation of teaching (SET) in evaluating teaching quality among lecturer, The implementation of SET not only enhance the standard of teaching and learning and give an impact on students' academic performance but also as critical decisions such as promotion, and for accreditation and governmental agencies that require such evaluations. Among the crucial components of SET were planning, teaching strategy, students' participation, coursework assessment, soft skills and course quality. The study withal strives the development of teaching quality model by means of a SET. This study seek to rectify the argument that the teaching quality measured by a SET contributes to students' academic performance. The teaching quality model and its relationship with students' academic performance were evaluated by using Partial Least Squares-Structural Equation Model (PLS-SEM) approach as the sample size was too small to utilize Structural Equation Modelling-Analysis of Moment Structure (SEM-AMOS).***

***A purposive sampling was utilized in this study involving 93 undergraduate students of Sultan Idris Education University's (UPSI) Mathematics Education Degree (BEd Maths) program. From the analysis, it revealed that all the relationships in the developed model were significant at p<0.001. The results indicated that the developed model was strengthened by empirical data and in-line with the preceding findings and theoretical framework. A part of teaching quality and students' academic performance path model, the study also prosperously validated all the indicator variables depicted in SET constructs, these were planning, teaching strategy, students' participation, coursework assessment, soft skills and course quality by means of structural equation model through PLS-SEM approach.***

***In conclusions, the relationship between teaching quality and students' academic performance not only be expressed in lower order components in PLS-SEM but also be modeled as a hierarchical component model where the teaching quality measured by a SET contributes to students' academic performance and were supported by empirical data,***

***Index Terms: Institutes of higher learning (IHL), student evaluation on teaching (SET), teaching quality model, students' academic performance, Partial Least Squares-Structural Equation Model (PLS-SEM)***

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## I. INTRODUCTION

Quality of teaching is a consequential component of engendering quality students.

Lecturers at an institutes of higher learning (IHL) not only need to conduct research and consultancy activities, but they crucially need to competent in teaching. This is aimed at engendering students who are able to cope with the challenges and demand of employment.

The implementation of teaching evaluation on lecturers by students is practiced by most IHL to meet the desiderata of students and the standards set by the IHL. Similarly, student performance is often associated with the quality of teaching. High teaching quality is expected to ameliorate student performance. Evaluation of lecturer teaching is essential to the development of professionalism, skills development, and lecturer skills. Evaluation of lecturer teaching is derived from classroom activities and student replication to lecturer teaching. The results of the lecturer's teaching evaluation are acclimated to ameliorate and enhance the efficacy of the lecturer's teaching while incrementing the work contentment of the lecturer. There are IHLs utilizing the students' evaluation of critical decisions such as promotion, and for accreditation and governmental agencies that require such evaluations. According to [1], teaching quality is a significant part of scholarly activity. Different methods exist to test teaching quality; the students' feedback is one of these methods. While [2] stated that student evaluation of teaching (SET) was one of the methods to evaluate college teaching. As stated by [3], evaluating teaching quality holds much paramountcy. On the one hand, the quality of teaching is evaluated to improve the quality and ability of their teaching. On the other hand, IHLs can rely on evaluation feedback to improvise the system of education management. SET according to [4] will enable teachers to understand the messages of the students by recollecting their intent as edifiers to work strenuously for them, to be passionate, to be knowledgeable and to provide critical feedback. [5] revealed that good teaching quality will enhance students' academic performance. Many studies on teaching quality, mainly fixate on the details of the students' evaluation with a little examine the quantitative aspects [6]. This study therefore withal strive the students' academic performance predicate on teaching quality by examining the quantitative aspects using PLS-SEM.

## II. METHODOLOGY

### A. Teaching Quality and Students' Academic Performance Model

Many studies link the quality of teaching and students' academic performance, see [7],[8],[9]. [10] revealed that quality of teaching is a key factor in student achievement. According to [10], high-quality teachers not only motivate students but additionally ameliorate student performance beyond expectations. [11] accentuated that there was a high positive correlation between the achievements of the students and the quality of teaching, including the ability to deliver and the relationship between lecturers and students. Several IHLs in Malaysia are practicing evaluation of teaching quality by students. SET is the most common and a well-established way in evaluating teaching quality. As stated by [12], SET reflects the student's perception precisely and genuinely. According to [13], the student evaluation of the course and the lecturer is essential for both administrative supervision of educational programs and personal improvement of teaching techniques.

In this study, SET was based on Sultan Idris Education University (UPSI). The teaching quality elements measured in UPSI's SET inclusive of planning, teaching strategy, students' participation, coursework assessment, soft skills and course quality.

The research model of teaching quality in this study was based on Marzano evaluation model [14], [15], and [16]. Each of these works has been engendered from a synthesis of research and theory and can therefore be regarded as a summary of research on those elements which were traditionally correlated to student academic performance. Marzano evaluation model was composed of four domains, those are classroom strategies and behaviors; preparing and planning; reflecting on teaching; and collegiality and professionalism. In the context of this study, planning, teaching strategy, students' participation, coursework assessment, soft skills and course quality were employed as teaching quality variables. Teaching quality is expected to have relationship with students' academic performance. The proposed teaching quality model and its relationship with students' academic performance is depicted in Fig. 1.

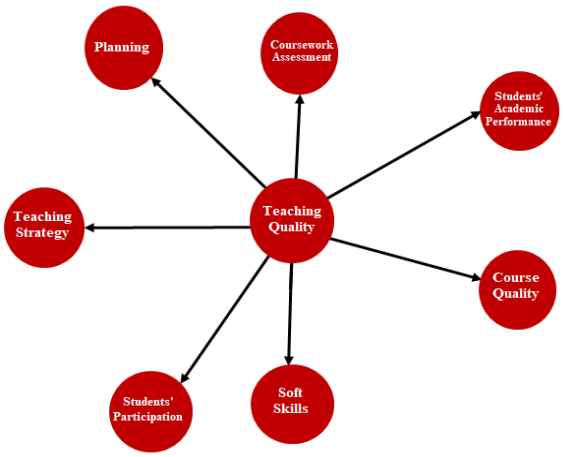


**Fig. 1. Teaching Quality and Students' Academic Performance Relationship Model**

### B. Teaching Quality and Students' Academic Performance Variables

The variables involve in the teaching quality in this study were planning, teaching strategy, students' participation, coursework assessment, soft skills and course quality. Each of these variables consists of five items which are listed in Table 1. While students' academic performance was assessed by means of their formative and summative assessment.

**Table 1: Teaching Quality and Students' Academic Performance Variables**

| Item | Planning |
|---|---|
| P1 | The Pro Forma of this course was explained at the beginning of teaching and learning sessions |
| P2 | The learning materials listed in Pro Forma are relevant to the content of the course. |
| P3 | Soft Skills are listed in Pro Forma. |
| P4 | Learning materials are uploaded online. |
| P5 | Learning sessions include the whole course content. |
| | **Teaching strategy** |
| TS1 | Variety of learning methods are applied in teaching and learning sessions. |
| TS2 | Teaching and learning sessions stimulate me to think critically and creatively |
| TS3 | Teaching and learning sessions help me understand my course content. |
| TS4 | Teaching and learning sessions emphasize the relevance of the theory and its application in everyday life. |
| TS5 | Teaching and learning sessions motivated me to study the course. |
| | **Students' participation** |
| SP1 | I was given a chance to ask during the teaching and learning session. |
| SP2 | Lecturer asks specific questions to encourage my involvement. |
| SP3 | I was given a chance to discuss with my friends. |
| SP4 | The activities planned for the teaching and learning session encourage my participation. |
| SP5 | I was given the opportunity to express an opinion during the teaching and learning session. |
| | **Coursework assessment** |
| CW1 | The assignments given are related to the content of the course. |
| CW2 | The assignments given are appropriate for my learning time. |
| CW3 | The assignment given helps me to relate the content of the course to the real world. |
| CW4 | The assignments are monitored and responded by lecturers throughout the teaching and learning process. |
| CW5 | The assignments are evaluated on the basis of process and results. |
| | **Soft skills** |
| SS1 | The lecturer provides the opportunity to perform different roles in the teaching and learning process. |
| SS2 | The lecturer reminds us of class punctuality. |
| SS3 | The lecturer provides an opportunity to communicate effectively. |
| SS4 | The lecturer reminds us how to socialize in a healthy and responsible way. |
| SS5 | My lecturer encourages problem solving approach throughout the teaching and learning process. |
| | **Course quality** |
| CQ1 | The content of the course corresponds to the credit hour. |
| CQ2 | The duration of the course corresponds to the credit hours. |
| CQ3 | The content of this course is relevant to the program. |
| CQ4 | This course is very important to the program. |
| CQ5 | Overall, I am satisfied with this course. |
| | **Students' academic performance** |
| AP1 | Formative assessment (Assignment, project, class presentation and quizzes) |
| AP2 | Summative assessment (Test and final examination) |

### C. Partial Least Squares-Structural Equation Model (PLS-SEM)

The study employed PLS-SEM in assessing the developed model. Two distinct phases were engaged in the PLS-SEM model evaluation. In the first phase, the inner equation (measurement model), the latent variable characteristics and measurement items that denote them were examined. The outer equation (structural model) was examined in the next phase to determine the relationship between latent variables as indicated in the research model. The procedure of assessing the developed research model as suggested by [17] were (i) identifying the structural model; (ii) specify the measurement model; (iii) data collection; (iv) estimation of path model; (v) assessing the results of the measurement model; (vi) assessing the results of the structural model; and (v) interpretation of the results.

### D. The Study Sample

The study sample comprised of 93 second semester Bachelor of Mathematics Education students' of the Theory of Probability and Statistics class at Sultan Idris Education University, Malaysia.

The study sample was selected by employing purposive sampling, as all the students were selected because they fit a particular profile. The students were asked to respond to SET instrument developed by UPSI based on a 3-level Likert scale. The response instruments were analyzed using the SmartPLS 3.0 software.

## III. FINDINGS AND DISCUSSIONS

### A. The Teaching Quality and Students' Academic Performance Measurement and Structural Model

The research model consists of the measurement and structural model. There were seven measurement models in this study, those were planning, teaching strategy, students' participation, coursework assessment, soft skills, course quality and students' academic performance that was categories as lower order components in PLS-SEM. In addition, the measurement model of teaching quality was categorized as a hierarchical component model. Meanwhile the structural model in this study was the path diagram that linked the teaching quality and students' academic performance in terms of relationship as depicts in Fig. 2.

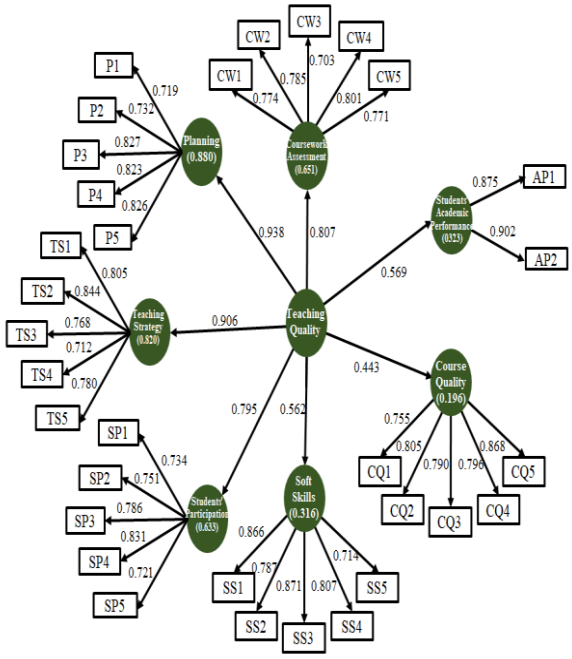


**Fig. 2. PLS-SEM Teaching Quality and Students' Academic Performance Relationship Model**

### B. Assessing the Reliability and Validity of the Measurement Model

This section discussed the constructs' reliability and validity as well as the assessment of each measurement model. As noted by [17], the measurement model evaluation was based on four criteria, these were internal consistency (Alpha Cronbach ($\alpha$), Rho_A and Composite Reliability (CR)); reliability of each indicator variable based on outer loading value; convergent validity (Average Variance Extracted (AVE)); and discriminant validity based on cross loading of indicator variables and Fornell-Larcker criterion.

The PLS-SEM output for internal consistency, convergent validity, and discriminant validity is shown in Table 2.

**Table 2. Outer Loading, Indicator Reliability, Cronbach Alpha, Rho_A, Composite Reliability and Average Variance Extracted Value**

| Constructs | Item | Outer-loading | Indicator reliability | Cronbach alpha | Rho_A | CR | AVE |
|---|---|---|---|---|---|---|---|
| Planning | P1 | 0.719 | 0.517 | 0.846 | 0.861 | 0.890 | 0.619 |
| | P2 | 0.732 | 0.536 | | | | |
| | P3 | 0.827 | 0.684 | | | | |
| | P4 | 0.823 | 0.677 | | | | |
| | P5 | 0.826 | 0.682 | | | | |
| Teaching strategy | TS1 | 0.805 | 0.648 | 0.842 | 0.848 | 0.888 | 0.613 |
| | TS2 | 0.844 | 0.712 | | | | |
| | TS3 | 0.768 | 0.590 | | | | |
| | TS4 | 0.712 | 0.507 | | | | |
| | TS5 | 0.780 | 0.608 | | | | |
| Students' participation | SP1 | 0.734 | 0.539 | 0.822 | 0.824 | 0.876 | 0.586 |
| | SP2 | 0.751 | 0.564 | | | | |
| | SP3 | 0.786 | 0.618 | | | | |
| | SP4 | 0.831 | 0.691 | | | | |
| | SP5 | 0.721 | 0.520 | | | | |
| Coursework assessment | CW1 | 0.774 | 0.599 | 0.825 | 0.831 | 0.877 | 0.589 |
| | CW2 | 0.785 | 0.616 | | | | |
| | CW3 | 0.703 | 0.494 | | | | |
| | CW4 | 0.801 | 0.642 | | | | |
| | CW5 | 0.771 | 0.594 | | | | |
| Soft skills | SS1 | 0.866 | 0.750 | 0.872 | 0.900 | 0.905 | 0.657 |
| | SS2 | 0.787 | 0.619 | | | | |
| | SS3 | 0.871 | 0.759 | | | | |
| | SS4 | 0.807 | 0.651 | | | | |
| | SS5 | 0.714 | 0.510 | | | | |
| Course quality | CQ1 | 0.755 | 0.570 | 0.863 | 0.869 | 0.901 | 0.646 |
| | CQ2 | 0.805 | 0.648 | | | | |
| | CQ3 | 0.790 | 0.624 | | | | |
| | CQ4 | 0.796 | 0.634 | | | | |
| | CQ5 | 0.868 | 0.753 | | | | |
| Students' academic performance | AP1 | 0.875 | 0.766 | 0.735 | 0.742 | 0.883 | 0.790 |
| | AP2 | 0.902 | 0.814 | | | | |
| Teaching quality | P | 0.700 | 0.490 | 0.885 | 0.903 | 0.914 | 0.642 |
| | TS | 0.719 | 0.517 | | | | |
| | SP | 0.941 | 0.885 | | | | |
| | CW | 0.864 | 0.746 | | | | |
| | SS | 0.822 | 0.676 | | | | |
| | CQ | 0.733 | 0.537 | | | | |

Table 2 reveal that the Alpha Cronbach ($\alpha$) and CR value for planning, teaching strategy, students' participation, coursework, soft skills, course quality, teaching quality and students' academic performance constructs exceeded 0.70. As noted by [18], the indicator variables in each construct in this study were sufficient to measure the respective constructs. Further, the reliability value for each indicator variables that were evaluated based on outer loading were greater than 0.70. These outer loading values indicate that the indicator variables were sufficient to represent the constructs as suggested by [18]. In addition, the AVE values represent for the convergent validity of planning, teaching strategy, students' participation, coursework assessment, soft skills, course quality, teaching quality, and students' academic performance exceeded 0.50. These AVE values of greater than 0.50 indicates that the validity of each construct was achieved as suggested by [19].

Meanwhile the discriminating validity of the indicator variables based on cross loading is depicted in Table 3. The result revealed that the indicator's outer loading on the associated construct were greater than all of its loadings on other constructs (i.e. the cross loading), where the discriminant validity value shows the extent to which the items used to measure a construct differ from the other constructs. This shows that the indicator variables in planning, teaching strategy, students' participation, coursework assessment, soft skills, course quality, teaching quality, and students' academic performance were distinct from each other by empirical standards, and henceforth the measurement model shows sufficient discriminating validity.

As far as Fornell-Larcker criterion is concerned, the square root of the AVE for each construct was greater than the value of the corresponding coefficient in the respective row and column as shown in Table 3. It can be concluded that the discriminating validity for all the constructs in this study was achieved.

**Table 3. Fornell-Larcker Criterion and Cross Loadings Results**

| Construct | P | TS | SP | CW | SS | CQ | AP | TQ |
|---|---|---|---|---|---|---|---|---|
| Fornell-Larcker criterion | | | | | | | | |
| P | **0.787** | | | | | | | |
| TS | 0.736 | **0.783** | | | | | | |
| SP | 0.708 | 0.694 | **0.765** | | | | | |
| CW | 0.439 | 0.743 | 0.715 | **0.768** | | | | |
| SS | 0.522 | 0.621 | 0.617 | 0.528 | **0.811** | | | |
| CQ | 0.416 | 0.519 | 0.527 | 0.439 | 0.738 | **0.804** | | |
| AP | 0.595 | 0.602 | 0.591 | 0.345 | 0.442 | 0.345 | **0.889** | |
| TQ | 0.738 | 0.706 | 0.695 | 0.443 | 0.562 | 0.443 | 0.569 | **0.801** |
| Cross-loading | | | | | | | | |
| P1 | **0.719** | 0.524 | 0.618 | 0.499 | 0.322 | 0.291 | 0.303 | 0.550 |
| P2 | **0.732** | 0.579 | 0.558 | 0.580 | 0.415 | 0.392 | 0.441 | 0.653 |
| P3 | **0.827** | 0.675 | 0.669 | 0.678 | 0.487 | 0.331 | 0.476 | 0.663 |
| P4 | **0.823** | 0.698 | 0.611 | 0.555 | 0.399 | 0.336 | 0.512 | 0.623 |
| P5 | **0.826** | 0.668 | 0.611 | 0.672 | 0.411 | 0.304 | 0.573 | 0.639 |
| TS1 | 0.689 | **0.805** | 0.628 | 0.631 | 0.467 | 0.449 | 0.534 | 0.675 |
| TS2 | 0.659 | **0.844** | 0.664 | 0.526 | 0.572 | 0.447 | 0.541 | 0.666 |
| TS3 | 0.571 | **0.768** | 0.567 | 0.580 | 0.378 | 0.262 | 0.374 | 0.648 |
| TS4 | 0.645 | **0.712** | 0.628 | 0.548 | 0.475 | 0.470 | 0.456 | 0.611 |
| TS5 | 0.704 | **0.780** | 0.623 | 0.626 | 0.529 | 0.401 | 0.440 | 0.627 |
| SP1 | 0.644 | 0.571 | **0.734** | 0.514 | 0.533 | 0.455 | 0.438 | 0.574 |
| SP2 | 0.618 | 0.595 | **0.751** | 0.512 | 0.500 | 0.394 | 0.507 | 0.619 |
| SP3 | 0.571 | 0.616 | **0.786** | 0.546 | 0.556 | 0.510 | 0.266 | 0.617 |
| SP4 | 0.658 | 0.656 | **0.831** | 0.613 | 0.440 | 0.398 | 0.483 | 0.639 |
| SP5 | 0.601 | 0.596 | **0.721** | 0.548 | 0.333 | 0.260 | 0.573 | 0.592 |
| CW1 | 0.549 | 0.518 | 0.491 | **0.774** | 0.354 | 0.219 | 0.338 | 0.547 |
| CW2 | 0.623 | 0.646 | 0.593 | **0.785** | 0.427 | 0.323 | 0.416 | 0.663 |
| CW3 | 0.523 | 0.437 | 0.477 | **0.703** | 0.361 | 0.306 | 0.282 | 0.555 |
| CW4 | 0.653 | 0.605 | 0.509 | **0.801** | 0.492 | 0.455 | 0.359 | 0.691 |
| CW5 | 0.560 | 0.621 | 0.668 | **0.771** | 0.374 | 0.356 | 0.337 | 0.620 |
| SS1 | 0.379 | 0.527 | 0.477 | 0.376 | **0.866** | 0.754 | 0.235 | 0.453 |
| SS2 | 0.567 | 0.615 | 0.621 | 0.535 | **0.787** | 0.497 | 0.589 | 0.589 |
| SS3 | 0.442 | 0.508 | 0.511 | 0.449 | **0.871** | 0.655 | 0.441 | 0.488 |
| SS4 | 0.340 | 0.387 | 0.422 | 0.410 | **0.807** | 0.662 | 0.149 | 0.325 |
| SS5 | 0.286 | 0.388 | 0.386 | 0.303 | **0.714** | 0.690 | 0.205 | 0.311 |
| CQ1 | 0.314 | 0.400 | 0.466 | 0.355 | 0.671 | **0.755** | 0.394 | 0.343 |
| CQ2 | 0.400 | 0.466 | 0.443 | 0.386 | 0.634 | **0.805** | 0.369 | 0.389 |
| CQ3 | 0.377 | 0.429 | 0.388 | 0.343 | 0.650 | **0.790** | 0.146 | 0.408 |
| CQ4 | 0.249 | 0.355 | 0.435 | 0.323 | 0.672 | **0.796** | 0.330 | 0.280 |
| CQ5 | 0.298 | 0.412 | 0.386 | 0.346 | 0.642 | **0.868** | 0.161 | 0.329 |
| AP1 | 0.507 | 0.496 | 0.484 | 0.380 | 0.254 | 0.172 | **0.875** | 0.475 |
| AP2 | 0.548 | 0.571 | 0.563 | 0.425 | 0.517 | 0.427 | **0.902** | 0.533 |
| P | 0.606 | 0.565 | 0.494 | 0.666 | 0.472 | 0.386 | 0.365 | **0.700** |
| TS | 0.619 | 0.615 | 0.538 | 0.478 | 0.368 | 0.366 | 0.294 | **0.719** |
| SP | 0.672 | 0.644 | 0.692 | 0.639 | 0.529 | 0.409 | 0.590 | **0.941** |
| CW | 0.627 | 0.675 | 0.668 | 0.678 | 0.490 | 0.334 | 0.474 | **0.864** |
| SS | 0.621 | 0.695 | 0.607 | 0.554 | 0.398 | 0.337 | 0.508 | **0.822** |
| CQ | 0.595 | 0.639 | 0.568 | 0.517 | 0.432 | 0.307 | 0.453 | **0.733** |

* P: Planning, T: Teaching strategy, SP: Students' participation, CW: Coursework assessment, SS: Soft skills, CQ: Course quality, AP: Students' academic performance, TQ: Teaching quality

The study concluded that the measurement model is acceptable in response to evaluations based on criteria suggested by [17].

## C. Assessing the Structural Model

In order to evaluate the structural model in PLS-SEM, [17] suggested that the collinearity between constructs, the significance of the path coefficient, the coefficient of determination ($R^2$) values, the $f^2$ effect size, and the predictive relevance ($Q^2$) are to be examined

### Collinearity between constructs

The collinearity between constructs was not assessed due to fact that there was only a single exogenous latent construct (Teaching quality) in the structural model.

### The significance of the path coefficient

The bootstrapping method was used to evaluate the path coefficient. In this study, 93 cases were run using 500 bootstrapped samples recommended by [17]. The result of the bootstrapping analysis for the PLS-SEM is shown in Fig. 3.

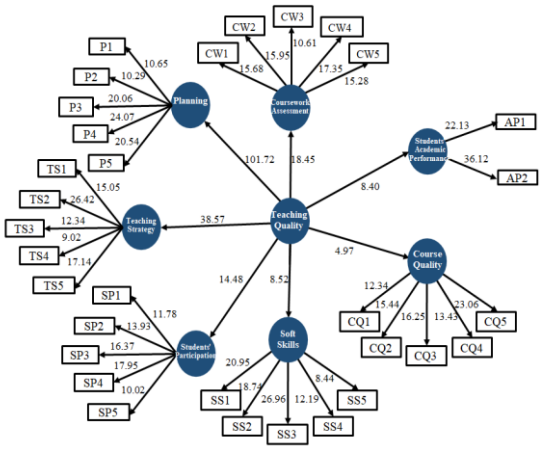


**Fig. 3. PLS-SEM Bootstrapping Analysis**

The evaluation of the significance and relevance of relationships in the structural model indicated that teaching quality and students' academic performance have a significant relationship ($\beta$= .569, $t(91)$ = 8.40, $p$ < .001). In addition, bootstrapping analysis as shown in Fig 3. revealed that all the relationships in the path model were significant at $p$ < .001.

### The coefficient of determination ($R^2$ value)

The amount of variation in Academic performance that the model depicted was determined by evaluating the significance of $R^2$. The study discloses that as shown in Fig. 2, the $R^2$ for students' academic performance was significant ($R^2$=0.323, $t(91)$=4.137, $p$ < .001) which means that 32.3% of variation in students' academic performance was explained by teaching quality.

In conclusion, the structural model depicted the amount of variation explained by the exogenous construct (Teaching quality) reasonably well.

### Effect size, $f^2$

In additament to evaluating the $R^2$ value, the vicissitude of $R^2$ value in multiple independent variables on the dependent variable, when a designated exogenous construct is omitted from the model can be habituated to evaluate whether the omitted construct has a substantive impact on the endogenous constructs. This can be done by using $f^2$ [17]. However, since there was only one exogenous latent variable (Teaching quality) in the structural model, the assessment was not carried out. The study only referred to the significance value of $R^2$ in the assessing the structural model.

### Predictive relevance, $Q^2$

The blindfolding procedure was utilized to determine the predictive relevance ($Q^2$ ) of the model fit. As stated by [20], the $Q^2$ shows how well observed values/indicator variables are reconstructed by the model and the parameter estimates. According to [17], $Q^2$ is deemed to be of predictive significance higher than zero.

Table 4 depicts the results of blindfolding of the measure of predictive relevance in this study.

**Table 4. Blindfolding Results of the Measure of Predictive Relevance**

| Construct | Cross-validated | SSO | SSE | $Q^2$(1-SSE/SSO) |
|---|---|---|---|---|
| Students' academic performance | Redundancy | 186 | 140.803 | 0.243 |
| | Communality | 186 | 125.460 | 0.325 |

* SSO: Sum of square observations
SSE: Sum of square errors

The $Q^2$ value of cross-validated redundancy and communality for this study was greater than zero. The result implied that the structural model should be able to provide a prediction of the indicator of the endogenous construct (Students' academic performance), where the teaching quality had predictive relevance for the endogenous construct (Students' academic performance).

## IV. CONCLUSION

The study successfully developed and evaluated the teaching quality model and their relationship with students' academic performance through PLS-SEM. As suggested by [17], the measurement and structural model had met the validation criteria based on empirical data. The study shows that there was a relationship between teaching quality and students' academic performance and were in-line with a study conducted by [7], [8], and [9].

The results betokened that the relationship of teaching quality and students' academic performance was statistically significant. These findings were withal fortified by other studies such as [10] and [11]. The results revealed that the developed model was fortified by empirical data and in-line with the antecedent findings and theoretical framework. In conclusions, the relationship of teaching quality as a hierarchical component model in PLS-SEM and students' academic performance each with its indicator variables can be modeled in structural form as highlighted in this paper.

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