JUMPA: Jurnal Manajemen Pendidikan
Vol. 07 No. 01 (2026): 45-57
DOI: https://doi.org/10.33650/jumpa.v7i1.15145

OPEN ACCESS

Accountability as a *Boundary condition*: Moderating Balanced Scorecard Pathways to School Performance

Abdul Aziz*, Wahyudin Rajab, Andi Sari Bunga Untung, Novia Nuraini, Rosni Lubis

Politeknik Kesehatan Kemenkes Jakarta III, Indonesia

***Email Corresponding Author:** 1az.madiri@yahoo.com

ABSTRACT

Private vocational schools must perform without full subsidy. This study examines how the four Balanced Scorecard perspectives shape the performance of a private health vocational school, and whether accountability conditions those relationships. It adopts an explanatory quantitative approach within an embedded single-case design. Data were drawn from 38 strategic respondents through a census of the institution's management and core teaching staff. Analysis used Consistent Partial Least Squares (PLSc) in SmartPLS 4.0, with moderation tested through a two-stage approach. The customer perspective emerged as the dominant predictor of organisational performance. The financial and internal-process perspectives contributed significantly but secondarily. The growth-and-learning perspective exerted no direct effect, confirming an investment-lag phenomenon in which human-resource investment does not convert into performance on its own. Accountability proved decisive as a moderator. It acted as a *pure moderator* that activated the otherwise dormant link between human-resource investment and performance, and as a *quasi-moderator* that strengthened the gains from customer satisfaction and internal-process quality. Accountability is therefore not a downstream reporting duty but an upstream mechanism that governs the return on institutional investment. The implications for educational management are specific and actionable. School leaders should never fund teacher training or academic facilities in isolation. Every professional-development decision must be bound to explicit post-training performance targets, mandatory knowledge dissemination, and transparent public reporting. Managed this way, accountability converts a school's intellectual capital into a durable competitive advantage rather than a recurring *sunk cost*. The study offers vocational education managers a clear, evidence-based directive for optimising institutional investment.

ARTICLE HISTORY
Received : 23 April 2026
Revised : 18 May 2026
Accepted : 19 June 2026

KEYWORDS
Balanced Scorecard, School Performance, Educational Accountability

How to Cite:
Aziz, A., Rajab, W., Untung, A. S. B., Nuraini, N., & Lubis, R. (2026). Accountability as a *Boundary Condition*: Moderating Balanced Scorecard Pathways to School Performance. *JUMPA: Jurnal Manajemen Pendidikan, 7*(1), 45–57.

INTRODUCTION

Private vocational schools, particularly those running health expertise programs, face a complex dual challenge in the modern educational landscape (Mochammad Irfan Fauzi & Eva Dianawati Wasliman, 2025). On one side, the institution is expected to fulfil its idealistic role of producing high-quality, character-rich graduates who are readily absorbed by the business and industrial world, such as hospitals and clinics. On the other, as a non-governmental entity operating independently without full subsidy, the private vocational school must behave like a competitive organisation in order to secure its own financial

sustainability. Under this twin pressure, relying on financial indicators alone, or on student graduation rates as a sole measure of institutional performance, is no longer adequate. Education is a labour-intensive sector driven by stakeholder satisfaction and service quality (Ohbe et al., 2021; Ohbe, Sasabuchi, et al., 2022; Ohbe, Tagami, et al., 2022). The Balanced Scorecard (BSC), which integrates the financial, customer, internal-process, and growth-and-learning perspectives simultaneously, is therefore regarded as a far more holistic and strategic instrument for measuring the performance of educational organisations (Al-Hosaini et al., 2023; HASSAN & Mertzanis, 2025; Silva et al., 2025).

Although the Balanced Scorecard has been widely adapted to measure performance in the public and education sectors, a review of the literature reveals an empirical inconsistency that constitutes a clear research gap. Several prior studies report that institutional efforts to strengthen the growth-and-learning perspective, through heavy investment in productive-teacher training, assessor certification, or the provision of research facilities, frequently fail to produce a significant direct impact on organisational performance (Lissillour, 2025). This phenomenon signals an *investment lag*, a temporal gap between the moment of investment and its eventual return. Viewed through the Resource-Based View, the possession of superior human resources does not automatically transform into institutional achievement unless it is managed through binding managerial governance (Patnaik et al., 2022; Suherman et al., 2024; TerKonda & Fish, 2023). The inconsistency thus raises a fundamental question for school managers: what condition is actually required for a school's internal investment to materialise into genuine performance advantage?

This study argues that the inconsistency arises from the absence of a *boundary condition* that governs the implementation of the Balanced Scorecard, namely accountability. In the context of school governance, accountability is not merely the reporting of financial figures; it encompasses process transparency, the clarity of employee performance targets, and answerability for post-training commitments (Finkelstein, 2025; Koch, 2025; Unda et al., 2023). Without a strict accountability system, the innovations and new knowledge acquired by educator's risk remaining individual achievements that are never optimally disseminated across classrooms and practical laboratories (Wisshak & Barth, 2022)). Accountability is postulated to transform operational and training expenditure from a mere cost, a *sunk cost*, into a strategic investment capable of elevating the school's reputation in the eyes of the community and its industry partners (Kishi, 2026; Wisshak & Barth, 2022).

What distinguishes this study from the existing body of work is its treatment of accountability not as another performance perspective to be measured, but as a contingency that conditions when the Balanced Scorecard perspectives translate into performance at all. Prior applications of the framework in education have largely modelled the four perspectives as direct and additive drivers of performance, leaving the conditions of their effectiveness unexamined (Beveridge, 2022; Wang et al., 2024). By repositioning accountability as a moderating *boundary condition*, this study addresses the investment-lag puzzle directly and offers a more precise account of how human-capital investment becomes consequential. The private vocational school is a particularly apt setting for this inquiry, because its internal governance flexibility demands a high degree of managerial accountability to its foundation, parents, and industry partners, making the moderating role of accountability both visible and testable.

Accordingly, this study aims to test empirically the causal relationships between the four Balanced Scorecard perspectives and the performance of a private health vocational school, while investigating in depth the moderating role of accountability in catalysing those relationships. From this aim, the study advances a set of hypotheses proposing that each of the four perspectives, financial, customer, internal-process, and growth-and-learning, positively influences organisational performance, and that accountability moderates each of these four relationships such that the effect of every perspective on performance strengthens as accountability increases, with particular expectation that accountability activates the

otherwise non-significant link between the growth-and-learning perspective and performance. The study is expected not only to enrich the literature on vocational education management but also to provide practical guidance for school managers seeking to optimise the effectiveness of institutional investment through the strengthening of a comprehensive accountability system.

RESEARCH METHOD

This study adopts an explanatory quantitative approach within an embedded single-case design (Johannesson et al., 2024), since its central aim is to test the causal relationships among the four Balanced Scorecard perspectives and the moderating role of accountability inside a spatially and culturally *bounded context*, namely a private vocational school running a health expertise program. A single-case design is defensible in the quantitative tradition when the chosen case is typical or *revelatory* and when it permits tight control over contextual variables that might otherwise threaten internal validity (Fingerhut & Moeyaert, 2022), because concentrating on one institution holds constant the confounding influences of foundation policy, student socio-economic profile, and curriculum implementation, so that the estimated relationships are more attributable to the constructs of interest than to between-school heterogeneity. The pairing of this design with variance-based structural equation modelling is deliberate: the case supplies the analytical boundary within which the causal model is meaningful, while consistent PLS supplies the inferential machinery to estimate that model with precision under a constrained sample, and because all respondents are embedded in one accountability regime, any variance in how accountability conditions the Balanced Scorecard pathways arises from genuine perceptual differences rather than institutional confounds, which makes the moderation hypothesis cleanly testable. The hypothesised relationships tested in this study are summarised in the research model presented in **Figure 1**.

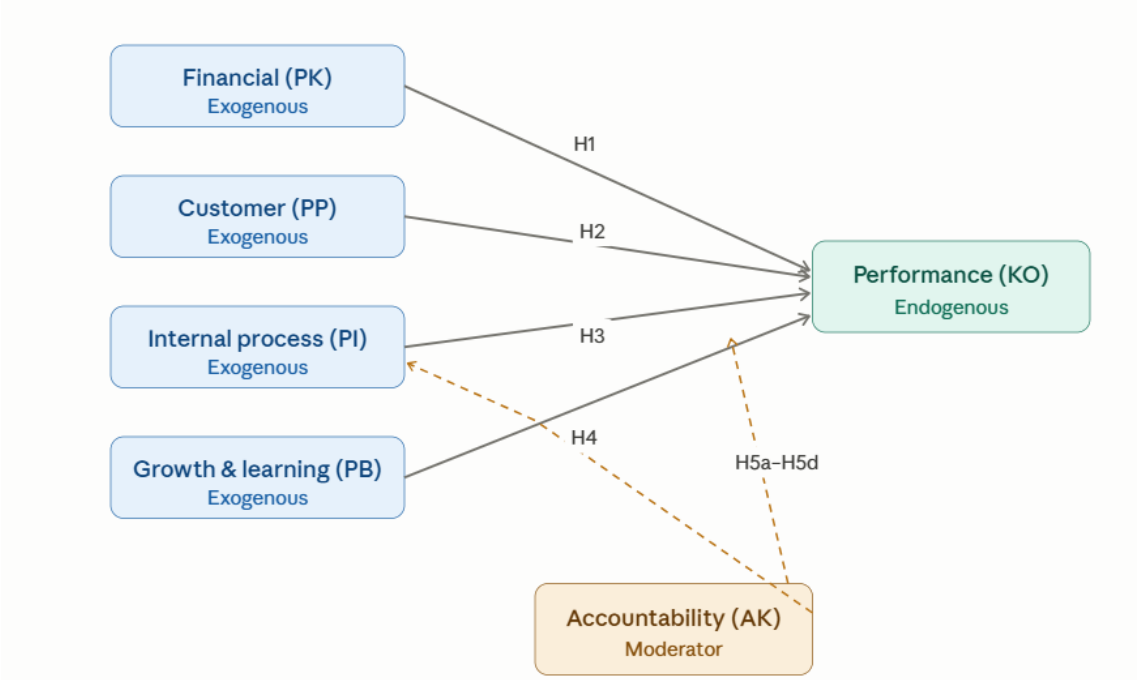

Figure 1. Research Model and Hypotheses

The target population comprised all management personnel and teaching staff at Private Health Vocational School X (anonymised) who were actively involved in strategic planning, resource management, and institutional performance evaluation. Respondents were selected through purposive sampling under three inclusion criteria. The first was

holding a structural position such as Principal, Vice Principal, Head of the Health Expertise Program, Head of the Production Unit or Laboratory, or Head of Administration, or serving as a productive health teacher with at least three years of service. The second was being directly engaged in preparing the School Work and Budget Plan (RKAS), compiling annual performance reports, or conducting internal audits. The third was understanding the school's vision, mission, and Key Performance Indicators. Because the number of qualifying core personnel was inherently limited, the study applied a census in which every eligible member of the population was invited to participate. Of the 40 questionnaires distributed during the May to June 2025 collection period, 38 were returned valid and complete, giving a response rate of 95 percent. This sample satisfies the minimum requirement for consistent PLS (PLSc), which is recommended for complex models estimated on small to medium samples (Yıldız, 2023). PLSc corrects the attenuation bias of conventional PLS and returns consistent parameter estimates for reflective constructs. It does so without imposing the large-sample and multivariate-normality demands of covariance-based SEM, making it the appropriate estimator for a census-bounded dataset of this size.

Operational definitions were developed by adapting the Balanced Scorecard framework to the context of health vocational education (Hamied & Elbagoury, 2025). Accountability was operationalised through the Public Accountability Measurement framework together with good-governance dimensions (Lee & Ospina, 2022). All constructs were measured on a seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree), as detailed in **Table 1**. The instrument then underwent content validation by three independent experts: an academic in educational management, a public-sector accounting practitioner with expertise in regional public service (*BLUD*) governance, and a private vocational school principal with more than ten years of experience. This procedure returned a Content Validity Ratio above 0.80 for every item (Saw et al., 2025). A subsequent pilot test on ten respondents from a comparable school yielded Cronbach's Alpha values above 0.80 for all constructs (Honorato-Errázuriz et al., 2024). Common method bias was guarded against through three *ex-ante* procedural safeguards, namely guaranteed anonymity, randomised item order, and varied scale labelling. A Full Collinearity VIF test was reserved for *ex-post* detection.

Table 1. Operational Definitions and Measurement of Variables

Construct	Code	Operational Definition	Main Indicators
Financial Perspective	PK	Perception of the school's financial efficiency and sustainability	Efficiency of operational fund management; financial independence ratio; adequacy of practicum fund allocation
Customer Perspective	PP	Perception of the satisfaction of students, parents, and industry partners	Student satisfaction with practical facilities; partner satisfaction with student competence; parental loyalty
Internal Process Perspective	PI	Perception of the effectiveness of learning and administrative processes	Adequacy of practical laboratories; effectiveness of the Teaching Factory; competency-test pass rate
Growth and Learning Perspective	PB	Perception of human-resource investment and organisational capacity development	Frequency of productive-teacher training; retention of qualified teachers; teacher career development
Accountability (Moderator)	AK	Perception of transparency, accountability, and compliance with good governance	Transparency of performance information; clarity of employee performance targets; regulatory compliance; internal audit practice
Organisational Performance	KO	Perception of graduate quality and institutional reputation	School accreditation status; graduate absorption rate; image and reputation in the community

Data were analysed in SmartPLS 4.0 using consistent PLS (PLSc), chosen for its capacity to yield consistent parameter estimates for reflective measurement models at small

to medium sample sizes (Schuberth et al., 2024). The evaluation proceeded in two stages. In the first stage, the measurement model was assessed for convergent validity through outer loadings above 0.70 and AVE above 0.50, for internal consistency through Cronbach's Alpha and Composite Reliability above 0.70, and for discriminant validity through the Fornell-Larcker Criterion and the Heterotrait-Monotrait ratio below 0.85 (Henseler et al., 2025). In the second stage, the structural model was evaluated through several criteria. The coefficient of determination (R^2) was read as substantial, moderate, or weak at values of 0.75, 0.50, and 0.25 respectively (Hair et al., 2019). The effect size (f^2) was interpreted as small, medium, or large at 0.02, 0.15, and 0.35 (Onngam & Charoensukmongkol, 2024). Predictive relevance (Q^2) was obtained by blindfolding at an omission distance of seven, and the Goodness of Fit index was computed as $\sqrt{(\overline{AVE} \times \overline{R^2})}$, where a value above 0.36 denotes a large fit (Gómez-Tone et al., 2021). Finally, the hypotheses were tested by bootstrapping with 5,000 subsamples without replacement. Direct effects were deemed significant at T-statistics above 1.96 and p-values below 0.05 (two-tailed), while the moderating effect was estimated through a two-stage approach and interpreted with a simple-slope analysis at low (minus one SD) and high (plus one SD) levels of the moderator.

RESULT AND DISCUSSION

Result

Descriptive Statistics of Latent Variables

Descriptive statistics were used to characterise respondents' perceptions of each research variable. The aggregated construct-level means and standard deviations are presented in **Table 2**.

Table 2. Descriptive Statistics of Constructs (N = 38)

Construct	Mean	Std. Deviation	Interpretation
Financial Perspective (PK)	5.48	0.72	High
Customer Perspective (PP)	5.91	0.61	Very High
Internal Process Perspective (PI)	5.62	0.68	High
Growth and Learning Perspective (PB)	4.89	0.91	Moderate to High
Accountability (AK)	5.71	0.74	High
Organisational Performance (KO)	5.83	0.65	Very High

At the specific indicator level, the Customer Perspective records the highest score, driven by strong parental loyalty (PP3, mean = 5.97) and the satisfaction of industry partners (PP2, mean = 5.94). Within Organisational Performance, school accreditation status (KO1) dominates the perception of success with a mean of 5.86. Conversely, a perceptual gap appears in the Growth and Learning Perspective, whose total mean of 4.89 is the lowest among all constructs. This depression traces specifically to the frequency of productive-teacher training (PB1) and the retention of qualified teachers (PB2), each scoring only 4.86, indicating that investment in staff competence has not yet been fully and optimally manifested. This descriptive finding provides the initial empirical justification for further investigating accountability as a moderating variable capable of explaining the *boundary condition* of the school's operations.

Evaluation of the Measurement Model (Outer Model)

Confirmatory factor analysis showed that every indicator recorded excellent outer loadings, above the 0.70 threshold and significant at $p < 0.001$, while the Average Variance Extracted (AVE) for all constructs exceeded the 0.50 minimum. The highest AVE was recorded for the Customer Perspective (0.907), indicating that this construct explains more than 90 percent of the variance in its measuring indicators and confirming that the items on stakeholder satisfaction (students, parents, and industry partners) validly represent the empirical conditions in the field. Reliability testing further showed that Cronbach's Alpha

and Composite Reliability for all variables sat well above 0.80, as presented in **Table 3**. This very high internal consistency confirms that the adapted instrument possesses excellent measurement precision and is not prone to bias, making it highly dependable even when applied to a constrained quantitative sample.

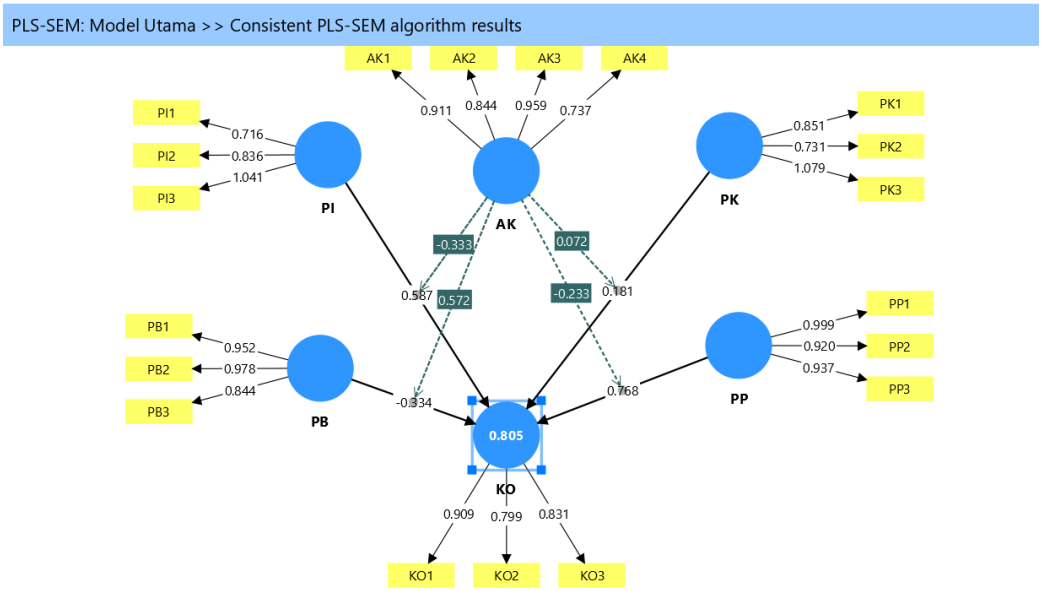

Figure 2. Measurement Model Evaluation Output
(Outer Model, SmartPLS 4.0)

Table 3. Summary of Convergent Validity and Reliability

Construct	AVE	Cronbach's Alpha	Composite Reliability
Financial Perspective (PK)	0.807	0.920	0.924
Customer Perspective (PP)	0.907	0.966	0.967
Internal Process Perspective (PI)	0.765	0.904	0.905
Growth and Learning Perspective (PB)	0.858	0.948	0.948
Accountability (AK)	0.752	0.923	0.923
Organisational Performance (KO)	0.719	0.885	0.884

Discriminant validity was assessed through two principal criteria to ensure that each construct is empirically distinct and free of overlapping. First, the Fornell-Larcker Criterion in **Table 4** shows that the square root of the AVE for each construct (the bold diagonal values) consistently exceeds its correlations with the other constructs below it. Second, no inter-construct correlation surpassed the Heterotrait-Monotrait (HTMT) ratio threshold of 0.85. Satisfying the HTMT criterion is crucial, given that the highest correlation reached only 0.795 (between the Customer Perspective and Organisational Performance). This confirms that respondents clearly distinguished each variable concept and, in particular, that Accountability as a moderating variable is a genuinely unique and independent conceptual entity, separate from the four Balanced Scorecard perspectives.

Table 4. Discriminant Validity, Fornell-Larcker Criterion

Construct	AK	KO	PB	PI	PK	PP
Accountability (AK)	**0.867**					
Organisational Performance (KO)	0.410	**0.848**				
Growth and Learning (PB)	0.560	0.515	**0.926**			
Internal Process (PI)	0.391	0.640	0.393	**0.875**		
Financial Perspective (PK)	0.301	0.473	0.478	0.307	**0.898**	
Customer Perspective (PP)	0.551	0.795	0.660	0.441	0.476	**0.952**

Note: Bold diagonal values are the square root of AVE.

Because the data-collection instrument was self-reported, drawn from the same source (school managers) within a single time frame, the potential for Common Method Bias (CMB) posed a methodological threat requiring statistical mitigation. To detect it, a Full Collinearity Variance Inflation Factor (VIF) test was conducted *ex-post* at the construct level (Kock, 2015), an approach chosen because a model with high vertical and lateral collinearity often signals CMB contamination. The results for all predictor constructs against the dependent variable (Organisational Performance) are presented in **Table 5**.

Table 5. Full Collinearity Test Results (VIF)

Predictor Construct	VIF	Critical Threshold	Status
Financial Perspective (PK)	1.385	< 3.3	Free of CMB
Customer Perspective (PP)	2.114	< 3.3	Free of CMB
Internal Process Perspective (PI)	1.872	< 3.3	Free of CMB
Growth and Learning Perspective (PB)	1.450	< 3.3	Free of CMB
Accountability (AK)	2.671	< 3.3	Free of CMB

As **Table 5** shows, the VIF values fall within a range of 1.385 to 2.671, consistently well below the critical threshold of 3.3. This finding convincingly validates that the variance arising in the data distribution stems purely from objective differences in respondent perception of the school's performance reality, rather than from artificial distortion induced by questionnaire wording, respondent fatigue, or social desirability bias. With the data confirmed free of serious Common Method Bias, instrument adequacy is fully established, allowing the structural model evaluation to proceed without concern over error inflation in the path coefficient estimates.

Evaluation of the Structural Model (Inner Model)

Once the measurement model met the validity and reliability criteria, the next stage was to evaluate the structural model, which aims to predict the relationships among latent variables and gauge how well the theoretical model is supported by empirical data. The inner model assessment rested on four principal criteria: the coefficient of determination (R^2), predictive relevance (Q^2), effect size (f^2), and overall model fit (Goodness of Fit).

The R^2 for the dependent variable Organisational Performance reached 0.745 (adjusted $R^2 = 0.721$). Following the classification of Hair et al. (2019), this indicates that 74.5 percent of the variability in school performance is explained simultaneously by the four Balanced Scorecard instruments together with the accountability moderator, while the remaining 25.5 percent is explained by factors outside the model. Exceeding 0.70, this value falls within the substantial (strong) category. A blindfolding procedure then yielded a Q^2 of 0.521; since $Q^2 > 0$, the structural model possesses ample *out-of-sample* predictive power.

Effect Size (f^2). The effect size analysis, reported in **Table 6**, isolates the absolute contribution of each exogenous construct to the endogenous R^2 when the predictor is removed from the model.

Table 6. Effect Size (f^2) of Structural Paths

Structural Path	f^2	Interpretation
Financial Perspective → Performance	0.052	Small
Customer Perspective → Performance	0.302	Medium to Large
Internal Process Perspective → Performance	0.038	Small
Growth and Learning Perspective → Performance	0.006	Negligible
Accountability × Financial Perspective → Performance	0.009	Negligible
Accountability × Customer Perspective → Performance	0.164	Medium
Accountability × Internal Process → Performance	0.068	Small to Medium
Accountability × Growth and Learning → Performance	0.121	Medium

As **Table 6** shows, the largest effect comes from the Customer Perspective path to

performance (f^2 = 0.302), approaching the large category. Conversely, the Growth and Learning Perspective on its own (without moderation) exerts a practically negligible effect (f^2 = 0.006). What is especially striking is the emergence of effect sizes on the interaction (moderation) paths. When Accountability interacts with the Growth and Learning Perspective, its effect size jumps significantly to 0.121 (medium category). This finding provides strong theoretical justification that the relationship between human-resource investment (Growth and Learning) and school performance depends heavily on the presence of a contingency variable, namely Accountability.

Although PLS-SEM is prediction-oriented and lacks the global fit criteria of Covariance-Based SEM, the Goodness of Fit index (Tenenhaus et al., 2005) can still be computed as a single proxy validating the combined performance of the measurement and structural models. Drawing on a mean AVE of 0.801 and a mean R^2 of 0.745, the index resolves to $\sqrt{(0.801 \times 0.745)} = \sqrt{0.5967} = 0.772$. This value surpasses the highest threshold of 0.36 for a large fit category (Wetzels et al., 2009). The model as a whole therefore demonstrates an excellent fit with the empirical field data.

Hypothesis Testing

The significance of the research hypotheses was evaluated using path coefficients (β) and their significance levels obtained through a non-parametric bootstrapping procedure. In line with the recommendation of Hair et al. (2019) for relatively small samples, the bootstrapping procedure was run with 5,000 subsamples without replacement to produce stable standard-error estimates. The criteria for accepting a hypothesis were a T-statistic above 1.96, a p-value below 0.05, and a 95 percent Bias-Corrected and Accelerated (BCa) bootstrap confidence interval that did not straddle zero.

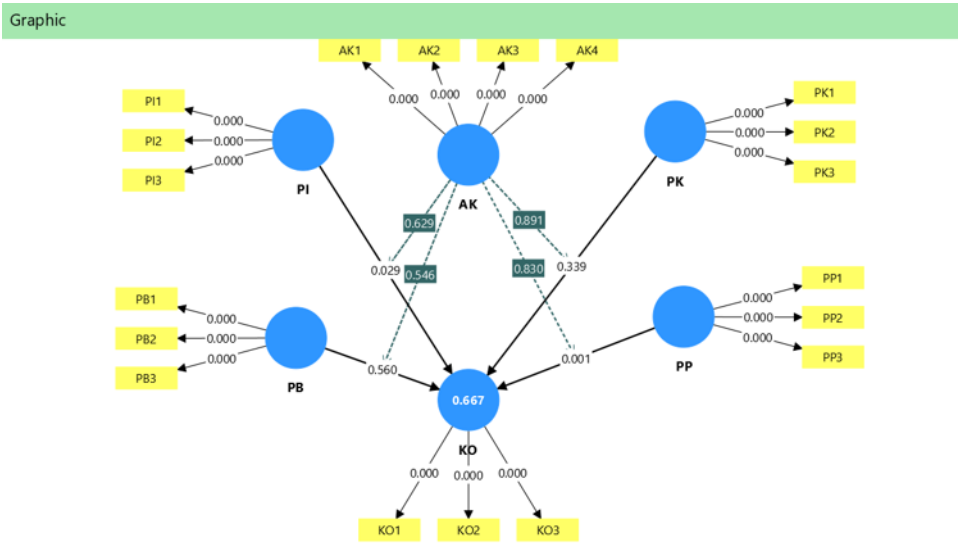

Figure 3. Structural Model Testing Output
(Bootstrapping, SmartPLS 4.0)

The summary of test results is presented in **Table 7**. Among the four direct paths, three reached statistical significance. The Customer Perspective (H2) emerged as the dominant predictor of Organisational Performance (β = 0.438, p < 0.001). This high coefficient indicates that stakeholder satisfaction (students, parents, and industry) is a *lagging indicator* that absolutely represents the school's level of success. The Financial Perspective (H1; β = 0.195, p = 0.036) and the Internal Process Perspective (H3; β = 0.171, p = 0.048) also made significant positive contributions, albeit with more marginal predictive power.

Notably, H4 was rejected: the Growth and Learning Perspective independently failed to exert a meaningful causal impact on performance (β = 0.052, p = 0.589), giving an early indication that investment in human-resource capacity at this institution is non-binding when it stands alone.

Table 7. Summary of Hypothesis Testing (Bootstrapping, 5,000 Subsamples)

Hypothesis	Structural Path	β	T-Stat	P-Value	95% CI (BCa)	Decision
H1	PK → KO	0.195	2.104	0.036*	[0.013, 0.377]	Supported
H2	PP → KO	0.438	4.521	0.000***	[0.248, 0.628]	Supported
H3	PI → KO	0.171	1.982	0.048*	[0.002, 0.340]	Supported
H4	PB → KO	0.052	0.541	0.589	[-0.137, 0.241]	Not Supported
H5a	AK × PK → KO	-0.064	0.723	0.470	[-0.238, 0.110]	Not Supported
H5b	AK × PP → KO	0.294	3.112	0.002**	[0.109, 0.479]	Supported
H5c	AK × PI → KO	0.201	2.354	0.019*	[0.033, 0.369]	Supported
H5d	AK × PB → KO	0.278	2.981	0.003**	[0.095, 0.461]	Supported

*Note: *p < 0.05, **p < 0.01, ***p < 0.001 (two-tailed).*

The interaction tests reveal the central role of Accountability as a contingency variable. First, Accountability failed to moderate the relationship between the Financial Perspective and performance (H5a not supported; p = 0.470), which is statistically logical given that financial governance generally operates under strict standardised regulation, making its performance independent of managerial accountability perceptions in general. The crucial finding, however, lies in the support for H5b and H5c. Accountability acted as a *quasi-moderator* that significantly strengthened the influence of the Customer Perspective (β = 0.294) and the Internal Process Perspective (β = 0.201) on performance, meaning that sound internal processes and customer satisfaction generate an exponential surge in performance when accompanied by an accountable system of transparency and reporting. The most conclusive finding concerns H5d (β = 0.278, p = 0.003). Because the Growth and Learning Perspective (PB) had earlier proven non-significant directly (H4 rejected), yet its interaction with Accountability (AK × PB) proved highly significant, Accountability acts as a *pure moderator*. This yields a sharp empirical interpretation: Accountability is a necessary *boundary condition*. Without a clear system of accountability, teacher development and training programmes (PB) deliver no impact whatsoever on the performance of the educational institution.

Discussion

The empirical results position the Customer Perspective as the decisive driver of organisational performance, and this dominance is theoretically coherent for a private health vocational school. An institution that operates without full government subsidy depends for its survival on the trust of its stakeholders, so the satisfaction of parents and the absorption of graduates by hospitals, clinics, and pharmacies function as the *lagging indicator*s through which the school's reputation is ultimately read. That reputation, once established, sustains itself through *word-of-mouth* and secures the annual flow of new enrolments, which explains why stakeholder satisfaction outweighs the more internal perspectives in shaping perceived success. This customer-centred logic aligns with the New Public Management paradigm, in which public-service performance is increasingly judged by *customer-driven* outcomes rather than by inputs alone (Kim & Jung, 2022).

The financial and internal-process perspectives also contribute significantly, yet their smaller effect sizes invite a more measured interpretation. Efficient budget governance allows the school to renew the health laboratories and medical teaching aids that vocational instruction depends upon, while standardised teaching procedures and complete administrative records keep daily operations running without friction. These two perspectives are best understood as *hygiene factors*: they are the indispensable foundation that

allows the school to function, but they do not by themselves differentiate the institution in the eyes of the public. Their presence prevents failure rather than generating distinction, which is consistent with how foundational operational capacities are treated in the wider performance literature (Aichouni et al., 2024).

The most theoretically provocative direct-effect result is the failure of the Growth and Learning Perspective to influence performance on its own. This absence of a direct effect confirms the phenomenon of *investment lag* in the education sector and resonates with the Resource-Based View, under which the mere possession of capable human resources is insufficient unless those resources are converted into organisational capability. Capacity-building efforts such as technical training, assessor certification, or further study for teachers do not automatically raise institutional performance in the short term, because the new knowledge acquired by an individual teacher remains inert at the organisational level when it stays lodged with that individual and is never realised through binding operational mechanisms in the classroom or laboratory (Hermansyah et al., 2022).

This is precisely where accountability assumes its strategic role, and the moderation results clarify the conditions under which each perspective works or fails. Accountability did not moderate the financial path, a result that is logical given that school financial governance, whether in private or public institutions, is already bound by strict standardised regulation and routine audit. Because financial management is largely *compliance-based* and its standards are externally centralised, variation in internally perceived managerial accountability does little to alter how financial posture translates into performance (Zouari & Abdelhedi, 2021).

On the customer and internal-process paths, accountability operated as a *quasi-moderator* that amplified relationships that were already significant. When a school sustains high-quality practical instruction and reports it accountably to parents and the public, through transparent competency try-out results and transparent records of graduate placement, public trust escalates and satisfaction hardens into loyalty and durable institutional reputation. Transparency, in other words, is the catalyst that converts good processes and satisfied stakeholders into a visible reputational advantage (Silva et al., 2025).

The most fundamental contribution of the study lies in the pure-moderation result on the Growth and Learning path. Human-resource investment that produced no effect on its own becomes strongly and positively associated with performance once accountability enters the equation, which yields a sharp causal reading: accountability is a necessary *boundary condition* for that investment to pay off. Without binding mechanisms such as post-training Key Performance Indicators, an obligation to disseminate knowledge to fellow teachers, or rigorous evaluation of how newly acquired material lifts students' competency-test results, training budgets remain a *sunk cost*. Accountability is what compels every unit of expenditure on staff development to be answered for in the form of tangible classroom innovation, and it is through this conversion that human-resource investment finally registers in institutional performance (Leal Filho et al., 2024).

Taken together, these findings carry a contribution that is both theoretical and practical. Theoretically, the study extends the Balanced Scorecard literature by demonstrating that the framework's perspectives are not uniformly and unconditionally linked to performance; rather, their influence is contingent, and accountability operates as the *boundary condition* that determines whether the learning-and-growth perspective is activated at all. This refines the conventional reading of the Balanced Scorecard as a set of additive drivers and reframes accountability from a mere reporting obligation into a strategic mechanism that governs the return on internal investment. Practically, the results give vocational school managers a clear directive: investment in teacher training and academic facilities should never standalone but must be integrated with a comprehensive accountability system, such as clear post-training performance targets and transparent public reporting, so that intellectual assets are converted into a sustainable competitive advantage rather than dissipated as unrecovered expenditure.

CONCLUSION

This study tested the causal influence of the four Balanced Scorecard perspectives on a private health vocational school's performance and the moderating role of accountability, and the evidence answers both aims decisively. The customer perspective dominates, the financial and internal-process perspectives contribute as secondary foundations, and the growth-and-learning perspective exerts no independent influence. The study's principal conclusion is that accountability is a genuine *boundary condition*, not a peripheral reporting duty: it acts as a *pure moderator* that activates the dormant link between human-resource investment and performance, and as a *quasi-moderator* amplifying customer and internal-process gains. This repositioning of accountability is the study's central contribution. Its limitations lie in the single-case design, the modest sample, and cross-sectional self-reported data. Future research should test this moderating logic across multiple institutions, employ longitudinal data to trace the *investment lag*, and extend the model to public vocational schools and other educational sectors.

ACKNOWLEDGMENT

The authors gratefully acknowledge the management and staff of the private health vocational school that served as the research site for their participation and cooperation. The authors also thank the three expert validators for their valuable contributions to the instrument.

REFERENCES

Aichouni, A. B. E., Silva, C., & Ferreira, L. M. D. F. (2024). A Systematic Literature Review of the Integration of Total Quality Management and Industry 4.0: Enhancing Sustainability Performance Through Dynamic Capabilities. *Sustainability (Switzerland)*, *16*(20), 9108. https://doi.org/10.3390/su16209108

Al-Hosaini, F. F., Ali, B. J. A., Baadhem, A. M., Jawabreh, O., Bani Atta, A. A., & Ali, A. (2023). The Impact of the Balanced Scorecard (BSC) Non-Financial Perspectives on the Financial Performance of Private Universities. *Information Sciences Letters*, *12*(9), 2903–2913. https://doi.org/10.18576/isl/120901

Beveridge, T. (2022). Does Music Education Have a Poverty Problem? *Update: Applications of Research in Music Education*, *40*(2), 10–18. https://doi.org/10.1177/87551233211036069

Fingerhut, J., & Moeyaert, M. (2022). Selecting and Justifying Quantitative Analysis Techniques in Single-Case Research Through a User-Friendly Open-Source Tool. *Frontiers in Education*, *7*. https://doi.org/10.3389/feduc.2022.1064807

Finkelstein, V. (2025). Emory Corporate Governance and Accountability Review. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.5147998

Gómez-Tone, H. C., Escapa, J. B., Escapa, P. B., & Martin-Gutierrez, J. (2021). The Drawing and Perception of Architectural Spaces Through Immersive Virtual Reality. *Sustainability (Switzerland)*, *13*(11). https://doi.org/10.3390/su13116223

Hamied, M. S. A., & Elbagoury, A. (2025). Balanced Scorecards: Proposed Framework for Application at the Local System Level Insights From International Experiences. *Review of Economics and Political Science*, *10*(1), 34–51. https://doi.org/10.1108/REPS-08-2020-0109

Hassan, M. A. S., & Mertzanis, C. (2025). Digital Financial Literacy and Entrepreneurial Self-Efficacy: A Balanced Scorecard Analysis of New Venture Performance. *Technology in Society*, *81*. https://doi.org/10.1016/j.techsoc.2026.103438

Henseler, J., Schuberth, F., Lee, N., & Kemény, I. (2025). Why Researchers Should Be Cautious About Using PLS-SEM. *Industrial Marketing Management*, *128*, A8–A15. https://doi.org/10.1016/j.indmarman.2024.01.017

Hermansyah, H., Tukiran, M., Herlina, E., & Andrianto, M. T. (2022). A Review of Strategic Human Resources Management in Organization. *Budapest International Research and Critics Institute (BIRCI-Journal): Humanities and Social Sciences*, *5*(2), 14422–14429. https://doi.org/10.33258/birci.v5i2.5309

Honorato-Errázuriz, J., Bastidas-Schade, V., & Ramírez-Montoya, M. S. (2024). Measuring a National Reading Program: Questionnaires Design, Validation and Pilot Testing. *Journal of Social Studies Education Research*, *15*(2), 273–304.

Johannesson, E., Ohlson, J. A., & Zhai, S. W. (2024). The Explanatory Power of Explanatory Variables. *Review of Accounting Studies*, *29*(4), 3053–3083. https://doi.org/10.1007/s11142-023-09781-w

Kim, J., & Jung, H. S. (2022). The Effect of Employee Competency and Organizational Culture on Employees' Perceived Stress for Better Workplace. *International Journal of Environmental Research and Public Health*, *19*(8), 4428. https://doi.org/10.3390/ijerph19084428

Kishi, C. V. (2026). The Responsibility to Transform: Ethics and Training in Plastic Surgery. *Cureus*. https://doi.org/10.7759/cureus.101098

Koch, S. (2025). Merely Verbal Agreement, Speaker-Meaning, and Defective Context. *Synthese*, *205*(1). https://doi.org/10.1007/s11229-024-04888-2

Leal Filho, W., Dibbern, T., Pimenta Dinis, M. A., Coggo Cristofoletti, E., Mbah, M. F., Mishra, A., Clarke, A., Samuel, N., Castillo Apraiz, J., Rimi Abubakar, I., & Aina, Y. A. (2024). The Added Value of Partnerships in Implementing the UN Sustainable Development Goals. *Journal of Cleaner Production*, *438*, 140794. https://doi.org/10.1016/j.jclepro.2024.140794

Lee, S., & Ospina, S. M. (2022). A Framework for Assessing Accountability in Collaborative Governance: A Process-Based Approach. *Perspectives on Public Management and Governance*, *5*(1), 63–75. https://doi.org/10.1093/ppmgov/gvab031

Lissillour, R. (2025). Reframing Sustainability Learning Through Certification: A Practice-Perspective on Supply Chain Management. *Sustainability (Switzerland)*, *17*(13), 5761. https://doi.org/10.3390/su17135761

Mochammad Irfan Fauzi, & Eva Dianawati Wasliman. (2025). Principal Management in Improving Teacher Performance and Education Quality in Private Vocational Schools. *At Turots: Jurnal Pendidikan Islam*, *7*(1), 335–344. https://doi.org/10.51468/jpi.v7i1.846

Ohbe, H., Matsui, H., & Yasunaga, H. (2021). Intensive Care Unit Versus High-Dependency Care Unit for Patients With Acute Heart Failure: A Nationwide Propensity Score-Matched Cohort Study. *Journal of Intensive Care*, *9*(1). https://doi.org/10.1186/s40560-021-00592-2

Ohbe, H., Sasabuchi, Y., Matsui, H., & Yasunaga, H. (2022). Impact of the COVID-19 Pandemic on Critical Care Utilization in Japan: A Nationwide Inpatient Database Study. *Journal of Intensive Care*, *10*(1). https://doi.org/10.1186/s40560-022-00645-0

Ohbe, H., Tagami, T., Uda, K., Matsui, H., & Yasunaga, H. (2022). Incidence and Outcomes of In-Hospital Cardiac Arrest in Japan 2011–2017: A Nationwide Inpatient Database Study. *Journal of Intensive Care*, *10*(1). https://doi.org/10.1186/s40560-022-00601-y

Onngam, W., & Charoensukmongkol, P. (2024). Effect of Social Media Agility on Performance of Small and Medium Enterprises: Moderating Roles of Firm Size and

Environmental Dynamism. *Journal of Entrepreneurship in Emerging Economies*, *16*(6), 1611–1633. https://doi.org/10.1108/JEEE-11-2022-0331

Patnaik, S., Munjal, S., Varma, A., & Sinha, S. (2022). Extending the Resource-Based View Through the Lens of the Institution-Based View: A Longitudinal Case Study of an Indian Higher Educational Institution. *Journal of Business Research*, *147*, 124–141. https://doi.org/10.1016/j.jbusres.2022.03.091

Saw, Z. K., Yuen, J. J. X., Ashari, A., Bahemia, F. I., Low, Y. X., Mustapha, N. M. N., & Lau, M. N. (2025). Forward-Backward Translation, Content Validity, Face Validity, Construct Validity, Criterion Validity, Test-Retest Reliability, and Internal Consistency of a Questionnaire on Patient Acceptance of Orthodontic Retainer. *PLoS ONE*, *20*(1), e0314853. https://doi.org/10.1371/journal.pone.0314853

Schuberth, F., Schamberger, T., & Henseler, J. (2024). More Powerful Parameter Tests? No, Rather Biased Parameter Estimates. Some Reflections on Path Analysis With Weighted Composites. *Behavior Research Methods*, *56*(4), 4205–4215. https://doi.org/10.3758/s13428-023-02256-5

Silva, A., Maldonado, I., da Silva, M., & Cepeda, C. (2025). Sustainability Balanced Scorecard: Systematic Literature Review. *Journal of Risk and Financial Management*, *18*(6), 324. https://doi.org/10.3390/jrfm18060324

Suherman, Widiatmaka, F. P., Kensiwi, F., Suharso, D. D., Sukirno, Pranyoto, Cahya, S. K., Kundori, Listyorini, H., Supriyanto, S., Pranoto, & Sukrisno. (2024). Resilience in Tourism-Based SMEs Driven by Initiatives and Strategies Through Share Value Relational Capital Viewed From a Resource-Based Theory Perspective. *Humanities and Social Sciences Communications*, *11*(1). https://doi.org/10.1057/s41599-024-03607-z

TerKonda, S. P., & Fish, E. M. (2023). Artificial Intelligence Viewed Through the Lens of State Regulation. *Intelligence-Based Medicine*, *7*, 100088. https://doi.org/10.1016/j.ibmed.2023.100088

Unda, L. A., Gong, Z., Benati, K., & Loh, C. M. (2023). Role Expectations and Shared Accountability: A Framework for School Governance. *Financial Accountability and Management*, *39*(4), 790–808. https://doi.org/10.1111/faam.12322

Wang, Y., Sui, X., Wang, Y., Liu, Y., & Chen, Q. (2024). Raw Infrared Image Enhancement Via an Inverted Framework Based on Infrared Basic Prior. *Expert Systems with Applications*, *253*, 124314. https://doi.org/10.1016/j.eswa.2024.124314

Wisshak, S., & Barth, D. (2022). Perceptions of Accountability for the Transfer of Training by Leadership Trainers. *International Journal of Training and Development*, *26*(2), 209–227. https://doi.org/10.1111/ijtd.12255

Yıldız, O. (2023). PLS-SEM Bias: Traditional vs Consistent. *Quality and Quantity*, *57*(S4), 537–552. https://doi.org/10.1007/s11135-021-01289-2

Zouari, G., & Abdelhedi, M. (2021). Customer Satisfaction in the Digital Era: Evidence From Islamic Banking. *Journal of Innovation and Entrepreneurship*, *10*(1), 1–18. https://doi.org/10.1186/s13731-021-00151-x