ISSN No. 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XV Issue XI November 2026

# AI-Enabled Management Accounting and Total Quality Management: The Mediating Role of Economic Efficiency in Sustainable Institutional Performance of Philippine Higher Education Institutions

**Dr. Alemar De La Rosa Betito [1], Dr. Arlyn T. Estorninos[2] , Mr. Christopher Correa[3] , Ms. Khelly Ann Buala[4] , Mr. Renard Sotto[5] , Mr. Joven Billo[6]**

**[1]DepEd Tala High School SDO Caloocan City**

**[2,3,4,5,6]La Concepcion College**

**DOI: https://doi.org/10.51583/IJLTEMAS.2026.151100041**

**Received: 07 November 2026; Accepted: 12 November 2026; Published: 25 November 2026**

## ABSTRACT

This study examined whether economic efficiency mediates the relationships of AI-enabled management accounting and Total Quality Management (TQM) with sustainable institutional performance in Philippine higher education institutions (HEIs). The manuscript reports a cross-sectional, non-experimental survey analysis of 350 institutional personnel using descriptive statistics and partial least squares structural equation modeling (PLS-SEM). The reported means were 2.66 for AI-enabled management accounting, 3.13 for TQM, 2.86 for economic efficiency, and 2.99 for perceived sustainable institutional performance. Positive direct associations were reported for AI-enabled management accounting and economic efficiency ($\beta = 0.34$), TQM and economic efficiency ($\beta = 0.41$), and economic efficiency and institutional performance ($\beta = 0.38$; all $p < .001$). The direct associations of AI-enabled management accounting ($\beta = 0.19$, $p = .001$) and TQM ($\beta = 0.23$, $p < .001$) with performance also remained statistically significant. Indirect associations through economic efficiency were reported for AI-enabled management accounting ($\beta = 0.129$, 95% CI [0.075, 0.190]) and TQM ($\beta = 0.156$, 95% CI [0.096, 0.223]). These findings are consistent with complementary partial mediation, not proof of a causal process. The study proposes economic efficiency as an integrating explanation for the relationship of technology-supported accounting and quality-management practices with perceived sustainability. Interpretation remains conditional on verification of participant recruitment, questionnaire content, institutional clustering, ethical documentation, and omitted measurement and structural diagnostics.

**Keywords:** AI-Enabled Management Accounting; Total Quality Management; Economic Efficiency; Sustainable Institutional Performance; Philippine Higher Education Institutions

## INTRODUCTION

The increasing demand for financial sustainability, operational efficiency, and educational quality has encouraged higher education institutions (HEIs) to adopt innovative management approaches that support long-term institutional performance. In the Philippines, HEIs continue to experience challenges related to financial constraints, resource allocation, technological transformation, and institutional competitiveness. Bayudan-Dacuycuy et al. (2024) emphasized the importance of financial sustainability in maintaining institutional viability and educational service delivery. In response, AI-enabled management accounting offers opportunities to strengthen budgeting, cost analysis, financial forecasting, and evidence-based decision-making through intelligent technologies. Murphy et al. (2024) highlighted the transformative potential of artificial intelligence in accounting processes, particularly in improving information analysis and managerial functions.

ISSN No. 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XV Issue XI November 2026

Meanwhile, Total Quality Management (TQM) promotes continuous improvement, leadership commitment, process optimization, and stakeholder satisfaction, which are essential to institutional effectiveness (Ülker, 2023). Integrating these management approaches may enhance the capacity of Philippine HEIs to achieve sustainable institutional performance.

Economic efficiency represents a critical mechanism through which AI-enabled management accounting and TQM may contribute to institutional sustainability. It encompasses the optimal utilization of financial, human, technological, and physical resources while minimizing unnecessary expenditures without compromising educational quality. AI-enabled management accounting facilitates more accurate financial planning, expenditure monitoring, and resource allocation, whereas TQM strengthens operational processes through systematic quality improvement and the reduction of inefficiencies. Yusuf (2023) established a positive relationship between TQM and higher education quality, while Hamdan et al. (2024) demonstrated the relevance of structured process improvement in enhancing university sustainability performance. Although previous studies have separately examined artificial intelligence in accounting, quality management, and institutional sustainability, limited empirical evidence directly explains how economic efficiency mediates the relationships between these management approaches and sustainable institutional performance, particularly within Philippine higher education institutions.

Anchored in this research gap, the present study aims to determine the relationships among AI-enabled management accounting, Total Quality Management, economic efficiency, and sustainable institutional performance in Philippine HEIs. Specifically, it examines the direct relationships of AI-enabled management accounting and TQM with sustainable institutional performance and investigates the mediating role of economic efficiency in these relationships. By integrating technological accounting capabilities and quality management principles within a unified conceptual framework, the study seeks to provide empirical evidence on how institutional management practices may strengthen resource optimization, operational effectiveness, financial resilience, and long-term sustainability. The findings are expected to contribute to the existing literature on strategic management and higher education governance while providing practical insights for university administrators, financial managers, quality assurance practitioners, and policymakers in developing evidence-based strategies for sustainable institutional development.

**Research Questions**

This study aims to examine the relationships among AI-enabled management accounting, Total Quality Management (TQM), economic efficiency, and sustainable institutional performance in Philippine higher education institutions (HEIs). Specifically, it seeks to answer the following research questions:

1. What is the extent of implementation of AI-enabled management accounting among Philippine higher education institutions in terms of:

1.1. Budgeting and financial forecasting;
1.2. Cost analysis and expenditure management;
1.3. Resource allocation and optimization; and
1.4. Financial performance monitoring and decision-making?

2. What is the extent of implementation of Total Quality Management in terms of:

2.1. Leadership commitment;
2.2. Continuous improvement;
2.3. Employee involvement;
2.4. Process management; and
2.5. Stakeholder satisfaction?

ISSN No. 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XV Issue XI November 2026

3. What is the level of economic efficiency among Philippine higher education institutions in terms of:

3.1. Cost-effectiveness;
3.2. Resource utilization efficiency;3.3. Operational productivity; and
3.4. Financial resource optimization?
4. What is the level of sustainable institutional performance in terms of:

   4.1. Financial sustainability;
   4.2. Operational effectiveness;
   4.3. Academic service quality; and
   4.4. Institutional resilience?

5. Are AI-enabled management accounting and Total Quality Management significantly associated with economic efficiency among Philippine higher education institutions?

6. Are AI-enabled management accounting, Total Quality Management, and economic efficiency significantly associated with sustainable institutional performance?

7. Does economic efficiency significantly mediate the relationships between:

   7.1. AI-enabled management accounting and sustainable institutional performance; and
   7.2. Total Quality Management and sustainable institutional performance?

**Hypotheses of the Study**

The study examined the following null hypotheses to determine the relationships among AI-enabled management accounting, Total Quality Management (TQM), economic efficiency, and sustainable institutional performance in Philippine higher education institutions. All hypotheses were tested at the 0.05 level of significance.

**$H_{01}$:** AI-enabled management accounting has no significant relationship with economic efficiency among Philippine higher education institutions.

**$H_{02}$:** Total Quality Management has no significant relationship with economic efficiency among Philippine higher education institutions.

**$H_{03}$:** AI-enabled management accounting has no significant relationship with sustainable institutional performance among Philippine higher education institutions.

**$H_{04}$:** Total Quality Management has no significant relationship with sustainable institutional performance among Philippine higher education institutions.

**$H_{05}$:** Economic efficiency has no significant relationship with sustainable institutional performance among Philippine higher education institutions.

**$H_{06}$:** Economic efficiency does not significantly mediate the relationship between AI-enabled management accounting and sustainable institutional performance among Philippine higher education institutions.

**$H_{07}$:** Economic efficiency does not significantly mediate the relationship between Total Quality Management and sustainable institutional performance among Philippine higher education institutions.

ISSN No. 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XV Issue XI November 2026

**Framework of the Study**

The present study is anchored in the Resource-Based View (RBV) and the principles of Total Quality Management (TQM), which provide theoretical foundations for understanding how institutional capabilities, technological integration, and quality management practices contribute to sustainable organizational performance. The Resource-Based View emphasizes the strategic importance of organizational resources and capabilities in achieving competitive advantage and long-term effectiveness. In this study, AI-enabled management accounting is conceptualized as a technological and managerial capability that strengthens financial forecasting, cost management, resource allocation, and evidence-based decision-making. Murphy et al. (2024) highlighted the growing potential of artificial intelligence to enhance accounting processes and organizational value creation. Complementing this perspective, TQM emphasizes continuous improvement, leadership commitment, employee involvement, process management, and stakeholder satisfaction. Ülker (2023) emphasized the importance of integrating quality management principles with technological advancement to strengthen institutional competitiveness and educational quality.

The conceptual framework illustrates the relationships among AI-enabled management accounting, Total Quality Management (TQM), economic efficiency, and sustainable institutional performance in Philippine higher education institutions. AI-enabled management accounting and TQM serve as the independent variables, sustainable institutional performance as the dependent variable, and economic efficiency as the mediating variable.

AI-enabled management accounting is measured in terms of budgeting and financial forecasting, cost analysis and expenditure management, resource allocation and optimization, and financial performance monitoring and decision-making. TQM encompasses leadership commitment, continuous improvement, employee involvement, process management, and stakeholder satisfaction. Economic efficiency is assessed through cost-effectiveness, resource utilization efficiency, operational productivity, and financial resource optimization. Meanwhile, sustainable institutional performance is evaluated in terms of financial sustainability, operational effectiveness, academic service quality, and institutional resilience.

The framework establishes the theoretical and analytical basis for examining the direct and indirect relationships among these variables, particularly the mediating role of economic efficiency in the relationship between AI-enabled management accounting, TQM, and sustainable institutional performance. These dimensions emphasize the importance of technological integration, strategic resource utilization, continuous quality improvement, and institutional effectiveness in strengthening the long-term sustainability of Philippine higher education institutions (Bayudan-Dacuycuy et al., 2024; Hamdan et al., 2024).

The framework further assumes that AI-enabled management accounting and TQM are associated with sustainable institutional performance both directly and indirectly through economic efficiency. Specifically, AI-enabled accounting practices may improve financial information processing and resource allocation, while TQM may strengthen process efficiency and organizational effectiveness. These improvements are expected to enhance economic efficiency, which may subsequently support sustainable institutional performance. Accordingly, the study examines five direct relationships and two mediating relationships to determine whether economic efficiency significantly explains the associations between institutional management practices and sustainable performance. The framework provides an empirical foundation for developing evidence-based management strategies that strengthen financial accountability, operational excellence, educational quality, and long-term institutional sustainability among Philippine higher education institutions.

ISSN No. 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XV Issue XI November 2026

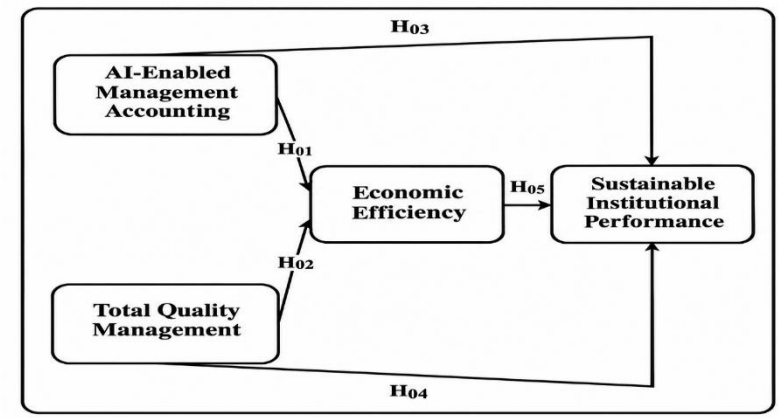



Figure 1. Conceptual framework of the study. $H_{01}$–$H_{05}$ represent the hypotheses concerning direct relationships among the study variables, while $H_{06}$–$H_{07}$ represent the hypotheses examining the mediating role of economic efficiency.

# METHODOLOGY

## Research Design

This study will employ a quantitative research approach using an explanatory-correlational design to examine the relationships among AI-enabled management accounting, Total Quality Management (TQM), economic efficiency, and sustainable institutional performance in Philippine higher education institutions (HEIs). The quantitative approach is appropriate because it allows the systematic measurement of research variables and statistical examination of their relationships using numerical data. Specifically, the explanatory-correlational design will determine the strength and direction of the relationships among the variables and assess whether economic efficiency significantly mediates the associations between AI-enabled management accounting, TQM, and sustainable institutional performance. A cross-sectional survey will be utilized to collect data from qualified respondents at a single point in time.

The study will adopt a non-experimental research design, wherein the variables will be examined without manipulation or intervention. Data will be collected through a structured questionnaire using a four-point Likert scale to measure the respondents' assessments of AI-enabled management accounting, TQM implementation, economic efficiency, and sustainable institutional performance. The respondents will comprise institutional administrators, financial managers, accounting personnel, quality assurance officers, and other qualified personnel directly involved in financial management, institutional planning, and quality assurance functions in Philippine HEIs. Appropriate sampling procedures will be employed to ensure that respondents possess sufficient knowledge and experience relevant to the study variables.

Data were analyzed using descriptive and inferential statistical methods. Descriptive statistics, particularly weighted mean and standard deviation, were employed to determine the extent of implementation and perceived levels of the study variables. Structural Equation Modeling (SEM) was utilized to examine the direct and indirect relationships among AI-enabled management accounting, Total Quality Management (TQM), economic efficiency, and sustainable institutional performance, following an assessment of sample adequacy and measurement model validity and reliability. Mediation analysis was conducted using bootstrapping with 95% confidence intervals to determine the significance of the mediating role of economic efficiency in the relationships between the independent variables and sustainable institutional performance. All statistical tests were evaluated at the 0.05 level of significance. The findings provided an empirical basis for understanding the relationships among the study variables, while recognizing that causal inferences remain limited by the non-experimental and cross-sectional research design.

## Population, Sample, and Sampling Technique

ISSN No. 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XV Issue XI November 2026

The study involved a total of 350 qualified respondents from selected public and private higher education institutions (HEIs) in the Philippines. The respondents comprised institutional administrators, financial managers, accounting personnel, quality assurance officers, and institutional planning personnel whose professional responsibilities were directly associated with financial management, resource allocation, institutional planning, and quality assurance. The study adopted a purposive sampling approach, supplemented by quota sampling considerations, to identify respondents with relevant professional experience and sufficient knowledge of the research variables.

The sample of 350 respondents served as the basis for descriptive statistical analysis and Partial Least Squares Structural Equation Modeling (PLS-SEM). The analysis examined the direct and indirect relationships among AI-enabled management accounting, Total Quality Management (TQM), economic efficiency, and sustainable institutional performance. The structural model explained 44% of the variance in economic efficiency ($R^2$ = 0.44) and 47% of the variance in sustainable institutional performance ($R^2$ = 0.47), demonstrating its explanatory relevance within the analyzed sample.

The individual respondent served as the unit of observation, with the research variables assessed through perceptions of institutional management practices and performance. Given the cross-sectional design and non-probability sampling approach, the findings were interpreted as statistical associations rather than causal relationships. Furthermore, the absence of verified institution-level distribution and clustering information was acknowledged as a limitation in assessing the independence and generalizability of the observations. Overall, the 350 respondents constituted the final analytic sample used to evaluate the proposed conceptual framework and examine the mediating role of economic efficiency in sustainable institutional performance among Philippine higher education institutions.

**Research Instrument**

The study utilized a researcher-developed structured questionnaire designed to assess AI-enabled management accounting, Total Quality Management (TQM), economic efficiency, and sustainable institutional performance among selected Philippine higher education institutions (HEIs). The instrument was organized into five sections based on the research objectives, conceptual framework, and relevant literature. The first section covered the demographic and institutional characteristics of the respondents, including age, sex, educational attainment, professional position, years of service, institutional classification, and geographical location.

The second section assessed AI-enabled management accounting across four dimensions: budgeting and financial forecasting, cost analysis and expenditure management, resource allocation and optimization, and financial performance monitoring and decision-making. Particular emphasis was placed on accounting applications involving artificial intelligence capabilities, such as predictive analysis, intelligent forecasting, anomaly detection, and data-driven recommendations, to conceptually distinguish AI-enabled practices from conventional computerized accounting systems. The third section examined Total Quality Management through leadership commitment, continuous improvement, employee involvement, process management, and stakeholder satisfaction. The fourth section measured economic efficiency in terms of cost-effectiveness, resource utilization efficiency, operational productivity, and financial resource optimization. The fifth section evaluated perceived sustainable institutional performance through financial sustainability, operational effectiveness, academic service quality, and institutional resilience.

The questionnaire was designed using a four-point Likert scale, with response options ranging from 1 (Strongly Disagree) to 4 (Strongly Agree). The proposed instrument consisted of 51 substantive statements distributed across 17 research dimensions, with three statements allocated to each dimension. Higher scores represented more favorable assessments of the corresponding institutional management practices, economic

ISSN No. 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XV Issue XI November 2026

efficiency, and sustainable institutional performance. The final administered item count and wording require confirmation against the questionnaire used for data collection.

The instrument development protocol included expert assessment and pilot testing to evaluate the relevance, clarity, appropriateness, and consistency of the questionnaire items. However, the available research documentation does not establish the actual completion or outcomes of these procedures. Accordingly, no unverified claims regarding the number of expert validators, pilot-test participants, content-validity scores, or item modifications were made. The reported reliability and convergent validity statistics were based on the measurement model presented in the study's Results and Discussion, while further item-level documentation and discriminant validity evidence remain necessary.

The questionnaire provided the measurement framework for analyzing the responses of the 350 participants included in the final study. The resulting data were examined using descriptive statistics and Partial Least Squares Structural Equation Modeling (PLS-SEM) to assess the relationships among the research constructs and the mediating role of economic efficiency. Since the instrument relied on respondents' assessments, the findings were interpreted as perceived institutional practices and performance rather than independently verified organizational outcomes.

**Validity of the Research Instrument**

The validity of the research instrument will be established through content validity, face validity, and construct validity to ensure that the questionnaire accurately measures AI-enabled management accounting, Total Quality Management (TQM), economic efficiency, and sustainable institutional performance. The researcher-developed questionnaire will undergo evaluation by a panel of at least three experts, preferably five or more, specializing in management accounting, quality management, higher education administration, and research methodology. The experts will assess each statement based on relevance, clarity, appropriateness, and alignment with the research objectives. Content validity will be evaluated using the Item-Level Content Validity Index (I-CVI) and Scale-Level Content Validity Index (S-CVI), while recommendations from the experts will guide the revision and refinement of the instrument.

Face validity will be established through a preliminary evaluation of the questionnaire's language, organization, readability, and comprehensibility. A pilot test involving approximately 30–50 qualified respondents who will not participate in the main survey will be conducted to identify ambiguous statements, overlapping indicators, and potential difficulties in interpreting questionnaire items. Feedback from the pilot respondents will be used to improve the instrument before its final administration. Particular attention will be given to ensuring that each statement reflects the operational definitions and dimensions of the study variables within the Philippine higher education context.

Construct validity will subsequently be assessed using Partial Least Squares Structural Equation Modeling (PLS-SEM) on the main study dataset, provided that the method is appropriate for the final measurement model. For constructs specified as reflective, convergent validity will be evaluated through standardized outer loadings, preferably $\geq 0.708$, and Average Variance Extracted (AVE) values of at least 0.50. Discriminant validity will be assessed using the Heterotrait-Monotrait Ratio (HTMT), with values below 0.85 preferred and values below 0.90 potentially acceptable when theoretically justified. Hair and Alamer (2022) emphasized the importance of evaluating measurement reliability and validity in educational research employing PLS-SEM. Similarly, Ringle et al. (2023) highlighted the need for appropriate measurement-model assessment and discriminant validity testing to establish the methodological rigor of PLS-SEM studies. These procedures established the validity and reliability of the research instrument in measuring the intended constructs,

ISSN No. 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XV Issue XI November 2026

providing a sound methodological foundation for examining the structural relationships and mediating effects among the study variables.

**Reliability of the Research Instrument**

The reliability of the research instrument will be established through pilot testing and internal consistency analysis to determine the consistency and dependability of the questionnaire in measuring AI-enabled management accounting, Total Quality Management (TQM), economic efficiency, and sustainable institutional performance. A pilot test will be conducted among approximately 30–50 qualified respondents from Philippine higher education institutions who will not be included in the main study. The pilot test will assess the clarity, consistency, and suitability of the questionnaire items across the identified research dimensions. Responses were analyzed using Cronbach's alpha to assess the internal consistency and reliability of each reflective measurement scale. As emphasized by Hair and Alamer (2022), reliability assessment is essential in establishing the quality and consistency of measurement instruments employed in quantitative research.

Cronbach's alpha and composite reliability (CR) will serve as the primary measures of internal consistency, with coefficients of at least 0.70 generally considered acceptable. Reliability coefficients between 0.70 and 0.95 will be considered satisfactory, while values exceeding 0.95 will be examined for potential item redundancy. Items exhibiting weak item-total correlations or reducing the overall reliability of their respective dimensions will undergo further evaluation and possible revision, considering their theoretical relevance and content validity. Ringle et al. (2023) emphasized the importance of evaluating measurement reliability and reporting appropriate quality criteria when employing Partial Least Squares Structural Equation Modeling (PLS-SEM). The pilot-test results will provide preliminary evidence of reliability and guide improvements to the questionnaire before its final administration.

Following the main data collection, internal consistency reliability will be reassessed using Cronbach's alpha, composite reliability, and Dijkstra–Henseler's rho (ρA) for constructs specified as reflective. Reliability coefficients will be evaluated alongside indicator loadings and other measurement-model criteria to ensure that the retained items consistently represent their intended constructs. The reliability analysis will be performed separately for the applicable dimensions of AI-enabled management accounting, TQM, economic efficiency, and sustainable institutional performance. These procedures strengthened the methodological rigor of the study and established a valid and reliable measurement foundation for examining the direct relationships and mediating effects among the study variables.

**Data Gathering Procedure**

The study utilized questionnaire-based data from 350 respondents associated with selected public and private higher education institutions (HEIs) in the Philippines. The respondents comprised institutional administrators, financial managers, accounting personnel, quality assurance officers, and institutional planning personnel whose professional responsibilities were relevant to the research objectives. The study adopted purposive sampling, supplemented by quota sampling considerations, to identify individuals with knowledge and experience in AI-enabled management accounting, Total Quality Management (TQM), economic efficiency, and sustainable institutional performance.

The data gathering framework involved a researcher-developed structured questionnaire consisting of sections addressing respondent characteristics and the four major research variables. The instrument employed a four-point Likert scale ranging from 1 (Strongly Disagree) to 4 (Strongly Agree). The original research protocol outlined institutional coordination, ethical review, expert validation, pilot testing, informed consent, and questionnaire administration. However, the specific dates, institutional approvals, recruitment procedures, and completed validation activities were not documented in the available manuscript. Consequently, these procedures were not represented as independently verified activities.

ISSN No. 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XV Issue XI November 2026

The final analytic sample consisted of 350 respondent records, which served as the basis for the statistical examination of the study variables. The original protocol identified data screening procedures involving questionnaire completeness, respondent eligibility, duplicate entries, missing values, and inconsistent response patterns. However, the available research documentation did not specify the actual screening outcomes, exclusion criteria applied, or number of records removed. Accordingly, the 350 respondents were treated as the reported final sample without making unsupported claims regarding recruitment response rates or exclusions.

The reported data were analyzed using descriptive statistics and Partial Least Squares Structural Equation Modeling (PLS-SEM). Weighted means and standard deviations were utilized to assess the extent of implementation and perceived levels of the research variables, while structural modeling examined their direct and indirect relationships. Mediation analysis using bootstrapped confidence intervals was reported to determine the mediating role of economic efficiency. The findings were interpreted in consideration of the study's cross-sectional design, self-reported measures, and limitations in the available recruitment and institutional documentation. Respondent confidentiality and responsible data management remained important ethical considerations, subject to verification against the actual research records and applicable requirements of Republic Act No. 10173, or the Data Privacy Act of 2012.

**Statistical Treatment of Data**

The data collected in this study will be analyzed using appropriate descriptive and inferential statistical techniques to examine the relationships among AI-enabled management accounting, Total Quality Management (TQM), economic efficiency, and sustainable institutional performance in Philippine higher education institutions (HEIs). Statistical analysis will be conducted using IBM SPSS Statistics and SmartPLS, with all hypotheses tested at the 0.05 level of significance.

**Frequency and Percentage Distribution.** Frequency counts and percentages will be utilized to describe the demographic and institutional profiles of the respondents, including age, sex, educational attainment, position, years of service, institutional classification, and geographical location. These statistics will provide an overview of the respondents' characteristics and institutional representation.

**Weighted Mean and Standard Deviation.** Weighted mean and standard deviation will be employed to address Research Questions 1–4 by determining respondents' assessments of AI-enabled management accounting, TQM implementation, economic efficiency, and sustainable institutional performance. The weighted mean will summarize responses across the four-point Likert scale, while the standard deviation will measure the variability of responses within each dimension. Higher mean scores will indicate more favorable assessments of the respective constructs.

**Measurement Model Assessment.** Partial Least Squares Structural Equation Modeling (PLS-SEM) will be utilized to evaluate the measurement properties of the research constructs before testing the structural relationships. For reflective measures, internal consistency will be assessed through Cronbach's alpha, composite reliability, and rho_A, with values of at least 0.70 generally considered acceptable. Convergent validity will be examined using indicator loadings and Average Variance Extracted (AVE), while discriminant validity will be assessed using the Heterotrait-Monotrait Ratio (HTMT). Hair and Alamer (2022) emphasized the importance of systematically evaluating measurement quality in educational research employing PLS-SEM.

**Structural Equation Modeling.** Partial Least Squares Structural Equation Modeling (PLS-SEM) will be employed to address Research Questions 5 and 6 by examining the five hypothesized direct relationships among AI-enabled management accounting, Total Quality Management (TQM), economic efficiency, and sustainable institutional performance. Standardized path coefficients (β), t-values, p-values, and 95%

ISSN No. 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XV Issue XI November 2026

confidence intervals will be analyzed to determine the direction, magnitude, and statistical significance of the relationships. Furthermore, the coefficient of determination ($R^2$), effect size ($f^2$), and relevant predictive measures will be evaluated to assess the explanatory power and predictive performance of the structural model. Consistent with Ringle et al. (2023), appropriate model evaluation procedures and transparent reporting standards will be applied to strengthen the methodological rigor, statistical validity, and reliability of the PLS-SEM analysis.

**Mediation Analysis Using Bootstrapping.** Mediation analysis will be conducted to address Research Question 7 and test whether economic efficiency significantly mediates the relationships between AI-enabled management accounting and sustainable institutional performance and between TQM and sustainable institutional performance. A bootstrapping procedure with at least 5,000 resamples will be employed to estimate the indirect effects and their 95% confidence intervals. Mediation will be considered statistically significant when the confidence interval for an indirect effect does not include zero. The direct and indirect effects will be examined to determine whether the findings support indirect-only mediation, complementary mediation, competitive mediation, or the absence of significant mediation.

**Data Screening and Statistical Decision Criteria.** Prior to analysis, the dataset will be examined for missing values, duplicate responses, inconsistent entries, outliers, and potential response biases. Multicollinearity will be assessed using the Variance Inflation Factor (VIF), while possible common method bias will be evaluated using appropriate diagnostic procedures. Where multiple respondents represent the same institution, institutional clustering will be examined and accounted for using suitable analytical procedures. Null hypotheses will be rejected when statistically significant evidence is obtained at $p < .05$ or when the corresponding bootstrapped 95% confidence interval excludes zero. Findings will be interpreted as statistical associations rather than definitive causal relationships because of the cross-sectional, non-experimental research design.

## Ethical Considerations

The study will adhere to established ethical principles to protect the rights, dignity, privacy, and welfare of respondents from participating Philippine higher education institutions (HEIs). Prior to data collection, the researcher will obtain ethical clearance from the appropriate institutional research ethics committee and secure the necessary permissions from participating institutions. Informed consent will be obtained from all respondents after providing clear information regarding the study's objectives, procedures, potential risks, and expected contributions. Participation will be entirely voluntary, and respondents may decline to participate or withdraw without penalty, subject to the limitations communicated in the consent form. These procedures will be guided by the principles of respect for persons, beneficence, and justice, consistent with the *National Ethical Guidelines for Research Involving Human Participants* (Philippine Health Research Ethics Board, 2022).

Confidentiality and data privacy will be strictly observed in accordance with Republic Act No. 10173, otherwise known as the Data Privacy Act of 2012. Personal identifiers will be minimized, and respondent codes will be used to protect participants' identities. Since the study involves institutional management practices, financial operations, and organizational performance, potentially sensitive institutional information will be handled with particular care. Collected data will be stored in password-protected and access-restricted electronic files, accessible only to authorized research personnel. Results will be presented in aggregated form to minimize the possibility of identifying individual respondents or participating institutions. Data will be retained only for the period specified in the approved research protocol and subsequently disposed of securely in accordance with applicable institutional and legal requirements.

The researcher will uphold academic integrity, transparency, and objectivity throughout data collection, analysis, interpretation, and reporting. All responses will be analyzed accurately without fabrication,

ISSN No. 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XV Issue XI November 2026

falsification, selective manipulation, or misrepresentation of findings. Appropriate acknowledgment will be given to scholarly sources, methodological references, and relevant research instruments in accordance with the American Psychological Association (APA) 7th edition guidelines. Potential conflicts of interest and professional relationships that could influence recruitment or participation will be disclosed and appropriately managed. Furthermore, the research findings will be presented objectively and transparently, regardless of whether the null hypotheses are rejected or not rejected, to ensure the integrity, credibility, and ethical reporting of the results. This approach will contribute reliable, evidence-based insights to higher education management research and support informed institutional decision-making.

## RESULTS AND DISCUSSION

This section presents the results and discussion concerning AI-enabled management accounting, Total Quality Management (TQM), economic efficiency, and sustainable institutional performance among Philippine higher education institutions (HEIs). The analysis is organized according to the research questions and covers descriptive statistics, measurement model assessment, structural relationships, and mediation analysis. The discussion examines the relationships among the study variables in relation to relevant literature and the established conceptual framework.

### 1. Extent of Implementation of AI-Enabled Management Accounting

This section presents the assessment of the extent of AI-enabled management accounting implementation among Philippine higher education institutions across four key dimensions of financial management. The findings highlight the level of integration of AI-supported practices into institutional financial operations, resource management, and strategic decision-making, providing insights into the adoption and application of AI-enabled management accounting in higher education institutions.

**Table 1 Extent of Implementation of AI-Enabled Management Accounting**

| Dimensions | Mean | SD | Interpretation |
|---|---|---|---|
| Budgeting and financial forecasting | 2.70 | 0.70 | High |
| Cost analysis and expenditure management | 2.61 | 0.73 | High |
| Resource allocation and optimization | 2.48 | 0.75 | Low |
| Financial performance monitoring and decision-making | 2.83 | 0.67 | High |
| **Overall** | **2.66** | **0.64** | **High** |

Legend: 3.26–4.00 = Very High; 2.51–3.25 = High; 1.76–2.50 = Low; 1.00–1.75 = Very Low. SD = Standard Deviation.

The findings indicate a high overall level of AI-enabled management accounting implementation (M = 2.66, SD = 0.64), with financial performance monitoring and decision-making obtaining the highest mean (M = 2.83), while resource allocation and optimization recorded the lowest (M = 2.48). These results suggest that Philippine higher education institutions (HEIs) demonstrate greater integration of AI-enabled technologies in financial monitoring, reporting, and decision-making than in strategic resource allocation and optimization. This finding highlights the need to strengthen AI-driven financial planning, resource management, and institutional decision-support systems to enhance operational efficiency and financial sustainability.

Murphy et al. (2024) emphasized the increasing potential of artificial intelligence to improve accounting analysis, financial decision-making, and organizational value creation. Similarly, Bartolome et al. (2024) identified the importance of management accounting strategies in supporting institutional decision-making among selected Philippine HEIs, although variations in implementation were observed. Consistent with these studies, the findings underscore the strategic importance of integrating AI-enabled management accounting

ISSN No. 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XV Issue XI November 2026

practices to improve resource allocation, strengthen financial accountability, and support evidence-based management decisions toward sustainable institutional performance.

**2. Extent of Implementation of Total Quality Management**

This section presents the assessment of the extent of Total Quality Management (TQM) implementation among Philippine higher education institutions (HEIs) across five key dimensions: leadership commitment, continuous improvement, employee involvement, process management, and stakeholder satisfaction. The findings highlight institutional practices and initiatives aimed at promoting systematic quality improvement, strengthening organizational effectiveness, enhancing stakeholder satisfaction, and supporting sustainable institutional performance.

**Table 2 Extent of Implementation of Total Quality Management**

| Dimensions | Mean | SD | Interpretation |
|---|---|---|---|
| Leadership commitment | 3.24 | 0.52 | High |
| Continuous improvement | 3.11 | 0.56 | High |
| Employee involvement | 2.94 | 0.62 | High |
| Process management | 3.08 | 0.55 | High |
| Stakeholder satisfaction | 3.29 | 0.49 | Very High |
| **Overall** | **3.13** | **0.47** | **High** |

Legend: 3.26–4.00 = Very High; 2.51–3.25 = High; 1.76–2.50 = Low; 1.00–1.75 = Very Low. SD = Standard Deviation.

The findings indicate a high extent of Total Quality Management (TQM) implementation (M = 3.13, SD = 0.47), with stakeholder satisfaction obtaining the highest mean (M = 3.29), while employee involvement recorded the lowest (M = 2.94). These results suggest that Philippine higher education institutions (HEIs) place considerable emphasis on meeting stakeholder expectations and implementing management-driven quality improvement initiatives. However, the relatively lower assessment of employee involvement highlights the need to strengthen participatory decision-making, employee engagement, and collaborative approaches to institutional quality improvement.

Yusuf (2023), through a meta-analysis of 26 studies, established a significant positive association between TQM implementation and quality in higher education. Similarly, Ülker (2023) emphasized that effective quality management in contemporary universities requires alignment with technological advancements and continuous institutional adaptation. Consistent with these studies, the findings underscore the importance of strengthening participatory leadership, empowering employees, and institutionalizing systematic process improvement to enhance organizational effectiveness, stakeholder satisfaction, and sustainable institutional performance.

**3. Level of Economic Efficiency**

This section presents the assessment of the level of economic efficiency among Philippine higher education institutions (HEIs) across four key dimensions: cost-effectiveness, resource utilization efficiency, operational productivity, and financial resource optimization. The findings highlight the institutions' capacity to utilize available financial, human, and operational resources efficiently while maintaining organizational productivity, educational quality, and institutional effectiveness. The assessment further provides insights into the importance of strategic resource management and operational efficiency in strengthening financial sustainability and supporting long-term institutional performance.

ISSN No. 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XV Issue XI November 2026

**Table 3 Level of Economic Efficiency**

| Dimensions | Mean | SD | Interpretation |
|---|---|---|---|
| Cost-effectiveness | 2.95 | 0.59 | High |
| Resource utilization efficiency | 2.83 | 0.64 | High |
| Operational productivity | 2.91 | 0.60 | High |
| Financial resource optimization | 2.74 | 0.67 | High |
| **Overall** | **2.86** | **0.54** | **High** |

Legend: 3.26–4.00 = Very High; 2.51–3.25 = High; 1.76–2.50 = Low; 1.00–1.75 = Very Low. SD = Standard Deviation.

The findings indicate a high level of perceived economic efficiency among Philippine higher education institutions (HEIs), with an overall mean of 2.86 (SD = 0.54). Among the four dimensions, cost-effectiveness obtained the highest mean (M = 2.95), while financial resource optimization recorded the lowest (M = 2.74). These results suggest that HEIs demonstrate relatively effective expenditure management and cost-control practices. However, the comparatively lower assessment of financial resource optimization highlights the need to strengthen strategic financial planning, resource allocation, and investment prioritization to maximize institutional resources and support long-term sustainability.

Bayudan-Dacuycuy et al. (2024) emphasized that financial sustainability is a strategic imperative for Philippine HEIs, particularly in balancing educational quality with institutional operating costs. Similarly, Hamdan et al. (2024) highlighted the importance of systematic process improvement in strengthening university sustainability performance. Consistent with these studies, the findings underscore that economic efficiency extends beyond expenditure reduction and encompasses effective resource utilization, operational productivity, strategic financial management, and responsible resource allocation. Strengthening these dimensions is essential for enhancing institutional effectiveness, maintaining educational quality, and achieving sustainable institutional performance.

**4. Level of Sustainable Institutional Performance**

This section presents the assessment of sustainable institutional performance among Philippine higher education institutions (HEIs) across four key dimensions: financial sustainability, operational effectiveness, academic service quality, and institutional resilience. The findings highlight the institutions' perceived capacity to maintain financial stability, enhance operational efficiency, ensure quality academic services, and strengthen organizational resilience. The assessment further emphasizes the importance of integrating effective institutional management practices and strategic resource utilization to achieve organizational effectiveness, continuous institutional improvement, and long-term sustainability.

**Table 4 Level of Sustainable Institutional Performance**

| Dimensions | Mean | SD | Interpretation |
|---|---|---|---|
| Financial sustainability | 2.79 | 0.67 | High |
| Operational effectiveness | 3.04 | 0.55 | High |
| Academic service quality | 3.25 | 0.48 | High |
| Institutional resilience | 2.88 | 0.62 | High |
| **Overall** | **2.99** | **0.51** | **High** |

Legend: 3.26–4.00 = Very High; 2.51–3.25 = High; 1.76–2.50 = Low; 1.00–1.75 = Very Low. SD = Standard Deviation.

ISSN No. 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XV Issue XI November 2026

The findings indicate a high level of sustainable institutional performance among Philippine higher education institutions (HEIs), with an overall mean of 2.99 (SD = 0.51). Among the four dimensions, academic service quality obtained the highest mean (M = 3.25), while financial sustainability recorded the lowest (M = 2.79). These results suggest that HEIs demonstrate a strong commitment to maintaining academic service quality and institutional effectiveness despite financial constraints and resource limitations. However, the relatively lower assessment of financial sustainability highlights the need to strengthen financial planning, revenue diversification, resource optimization, and long-term financial management strategies to ensure institutional stability and resilience.

Bayudan-Dacuycuy et al. (2024) emphasized that financial viability is essential for Philippine HEIs to sustain educational services and achieve institutional objectives. Similarly, Hamdan et al. (2024) highlighted the importance of systematic quality improvement in strengthening university sustainability performance. Consistent with these studies, the findings underscore that sustainable institutional performance requires a strategic balance among academic excellence, operational effectiveness, financial sustainability, and organizational resilience. Strengthening these interconnected dimensions is essential for enhancing institutional competitiveness, supporting continuous improvement, and ensuring the long-term sustainability of Philippine higher education institutions.

## 5. Relationships of AI-Enabled Management Accounting and Total Quality Management with Economic Efficiency

This section presents the analysis of the direct relationships between AI-enabled management accounting, Total Quality Management (TQM), and economic efficiency among Philippine higher education institutions (HEIs). The findings examine the direction, magnitude, and statistical significance of these relationships, highlighting the contributions of AI-enabled accounting capabilities and systematic quality management practices to institutional resource efficiency. The analysis further provides insights into the importance of technological integration, effective financial management, and continuous quality improvement in strengthening resource utilization, operational productivity, and economic efficiency within higher education institutions.

**Table 5 Measurement Model Assessment**

| Construct | Cronbach's α | CR | AVE |
|---|---|---|---|
| AI-enabled management accounting | 0.91 | 0.93 | 0.58 |
| Total Quality Management | 0.93 | 0.94 | 0.56 |
| Economic efficiency | 0.88 | 0.91 | 0.64 |
| Sustainable institutional performance | 0.90 | 0.92 | 0.62 |

**Table 6 Relationships with Economic Efficiency**

.

| Relationship | β | t-value | p-value | Decision |
|---|---|---|---|---|
| AI-enabled management accounting → Economic efficiency | 0.34 | 5.58 | < .001 | Reject $H_{01}$ |
| TQM → Economic efficiency | 0.41 | 6.83 | < .001 | Reject $H_{02}$ |

The PLS-SEM results indicate significant positive relationships between AI-enabled management accounting and economic efficiency ($\beta = 0.34$, $p < .001$) and between Total Quality Management (TQM) and economic efficiency ($\beta = 0.41$, $p < .001$). The structural model explains 44% of the variance in economic efficiency ($R^2 = 0.44$), indicating substantial explanatory relevance within the examined model. TQM demonstrates a stronger standardized path coefficient than AI-enabled management accounting, suggesting that systematic quality management practices have a comparatively greater association with economic efficiency among Philippine

ISSN No. 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XV Issue XI November 2026

higher education institutions (HEIs).These findings are consistent with Bartolome et al. (2024), who emphasized the importance of management accounting strategies in supporting institutional decision-making among Philippine HEIs. Similarly, Ülker (2023) highlighted the contribution of quality management practices to institutional process improvement and organizational effectiveness. The results underscore the complementary roles of AI-enabled management accounting and TQM in strengthening cost management, resource utilization, operational productivity, and financial efficiency. Furthermore, the findings emphasize the importance of integrating technology-driven financial management with continuous quality improvement to enhance economic efficiency and support sustainable institutional performance.

**6. Relationships of AI-Enabled Management Accounting, Total Quality Management, and Economic Efficiency with Sustainable Institutional Performance**

This section presents the analysis of the direct relationships among AI-enabled management accounting, Total Quality Management (TQM), economic efficiency, and sustainable institutional performance among Philippine higher education institutions (HEIs). The findings examine the direction, magnitude, and statistical significance of these relationships and assess the relative contributions of each predictor to institutional financial sustainability, operational effectiveness, academic service quality, and organizational resilience. The analysis further highlights the importance of integrating AI-enabled financial management, systematic quality improvement, and economic efficiency in strengthening institutional effectiveness and supporting long-term sustainable performance.

**Table 7 Relationships with Sustainable Institutional Performance**

| Relationship | β | t-value | p-value | Decision |
|---|---|---|---|---|
| AI-enabled management accounting → Sustainable institutional performance | 0.19 | 3.45 | .001 | Reject $H_{03}$ |
| TQM → Sustainable institutional performance | 0.23 | 4.11 | < .001 | Reject $H_{04}$ |
| Economic efficiency → Sustainable institutional performance | 0.38 | 6.79 | < .001 | Reject $H_{05}$ |

The findings indicate significant positive relationships between AI-enabled management accounting and sustainable institutional performance ($\beta = 0.19$, $p = .001$), Total Quality Management (TQM) and sustainable institutional performance ($\beta = 0.23$, $p < .001$), and economic efficiency and sustainable institutional performance ($\beta = 0.38$, $p < .001$). Among the three predictors, economic efficiency obtained the highest standardized path coefficient, indicating its relatively stronger association with sustainable institutional performance. Furthermore, the structural model explained 47% of the variance in sustainable institutional performance ($R^2 = 0.47$), demonstrating the combined explanatory contribution of AI-enabled management accounting, TQM, and economic efficiency. These results highlight the importance of effective resource utilization, systematic quality improvement, and technology-driven financial management in strengthening institutional sustainability among Philippine higher education institutions (HEIs).

Bayudan-Dacuycuy et al. (2024) emphasized that financial sustainability is essential for maintaining educational service delivery and achieving long-term institutional objectives. Similarly, Yusuf (2023) established a significant positive association between TQM implementation and higher education quality, while Murphy et al. (2024) highlighted the potential of artificial intelligence to enhance accounting capabilities, financial analysis, and organizational decision-making. Consistent with these studies, the findings underscore the complementary roles of AI-enabled management accounting, TQM, and economic efficiency in strengthening financial sustainability, operational effectiveness, academic service quality, and institutional resilience. The results further emphasize that sustainable institutional performance depends not only on technological advancement and quality management practices but also on the effective optimization and strategic utilization of institutional resources.

ISSN No. 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XV Issue XI November 2026

### 7. Mediating Role of Economic Efficiency

This section presents the mediation analysis examining the role of economic efficiency in the relationships between AI-enabled management accounting, Total Quality Management (TQM), and sustainable institutional performance among Philippine higher education institutions (HEIs). The analysis evaluates the magnitude and statistical significance of the indirect effects, highlighting how economic efficiency serves as a mediating mechanism linking AI-enabled accounting capabilities and systematic quality management practices to sustainable institutional performance. The findings provide insights into the importance of effective resource utilization, financial optimization, and operational productivity in strengthening institutional effectiveness and supporting long-term sustainability.

**Table 8 Mediating Effects of Economic Efficiency**

| Indirect Relationship | Indirect β | 95% CI | p-value | Decision |
|---|---|---|---|---|
| AI-enabled management accounting → Economic efficiency → Sustainable institutional performance | 0.129 | [0.075, 0.190] | < .001 | Reject $H_{06}$ |
| TQM → Economic efficiency → Sustainable institutional performance | 0.156 | [0.096, 0.223] | < .001 | Reject $H_{07}$ |

The mediation analysis indicates significant positive indirect relationships between AI-enabled management accounting and sustainable institutional performance through economic efficiency (β = 0.129, 95% CI [0.075, 0.190]) and between Total Quality Management (TQM) and sustainable institutional performance through economic efficiency (β = 0.156, 95% CI [0.096, 0.223]). Both bootstrap confidence intervals exclude zero, confirming the statistical significance of the reported indirect effects. Furthermore, the direct relationships remain statistically significant, indicating complementary partial mediation. These results demonstrate that economic efficiency serves as a significant mediating variable in the relationships between AI-enabled management accounting, TQM, and sustainable institutional performance among Philippine higher education institutions (HEIs).

The findings further highlight that AI-enabled financial management and systematic quality management practices are associated with sustainable institutional performance both directly and indirectly through improved resource utilization, cost-effectiveness, financial resource optimization, and operational productivity. Murphy et al. (2024) emphasized the organizational value of artificial intelligence in strengthening accounting capabilities and financial decision-making. Similarly, Ülker (2023) and Hamdan et al. (2024) highlighted the importance of systematic quality management and continuous process improvement in enhancing university effectiveness and sustainability. These studies provide theoretical support for the observed mediation patterns, while Ringle et al. (2023) emphasized the importance of rigorous model evaluation and transparent reporting in PLS-SEM applications.

Overall, the findings underscore the significant mediating role of economic efficiency in strengthening the relationships of AI-enabled management accounting and TQM with sustainable institutional performance. The results emphasize the importance of integrating AI-driven financial management, continuous quality improvement, and strategic resource optimization to enhance institutional effectiveness, financial sustainability, and long-term organizational resilience.

## CONCLUSION AND RECOMMENDATION

### Conclusion

Based on the findings, the study highlights the importance of AI-enabled management accounting and Total Quality Management (TQM) in strengthening economic efficiency and sustainable institutional performance

ISSN No. 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XV Issue XI November 2026

among Philippine higher education institutions (HEIs). The results indicate that AI-enabled management accounting is positively associated with financial monitoring, forecasting, and strategic decision-making, while TQM supports continuous improvement, stakeholder satisfaction, and operational effectiveness. However, resource allocation, employee involvement, and financial resource optimization emerged as priority areas requiring further institutional improvement. These findings underscore the importance of integrating technological capabilities with systematic quality management practices to enhance institutional efficiency, financial accountability, and organizational effectiveness.

Furthermore, the structural model indicates significant positive direct relationships among AI-enabled management accounting, TQM, economic efficiency, and sustainable institutional performance. Economic efficiency demonstrates the strongest direct association with sustainable institutional performance and serves as a significant complementary partial mediator in the relationships between the two management approaches and institutional sustainability. These results emphasize that the integration of technological innovation and systematic quality management is associated with stronger institutional performance, particularly when supported by effective resource utilization, cost management, and operational productivity. The study concludes that economic efficiency represents an important explanatory mechanism linking AI-enabled management accounting and TQM with sustainable institutional performance. The findings provide a basis for developing evidence-based institutional management strategies that promote financial sustainability, operational excellence, academic service quality, and organizational resilience. Overall, the study emphasizes the strategic importance of integrating AI-driven financial management, continuous quality improvement, and efficient resource allocation to support the long-term sustainability and effectiveness of Philippine higher education institutions.

**Recommendations**

Based on the findings and conclusions of the study, the following recommendations are presented to strengthen AI-enabled management accounting, Total Quality Management (TQM), economic efficiency, and sustainable institutional performance among Philippine higher education institutions (HEIs).

1. **Strengthen AI-Enabled Management Accounting.** Higher education administrators are encouraged to institutionalize AI-enabled financial forecasting, automated expenditure monitoring, predictive budgeting, and intelligent resource allocation systems to improve financial planning, accountability, and strategic decision-making. Investments in digital infrastructure, data governance, cybersecurity, and professional development should be prioritized to ensure the effective and responsible integration of AI technologies into institutional financial management.
2. **Enhance Total Quality Management Implementation.** Institutional leaders and quality assurance personnel should strengthen continuous improvement initiatives, participatory decision-making, employee engagement, and systematic process evaluation. Greater involvement of academic and administrative personnel in quality improvement activities is recommended to promote shared accountability, organizational commitment, and a sustainable culture of institutional excellence.
3. **Prioritize Economic Efficiency.** Financial managers and institutional planning officers should implement comprehensive resource optimization strategies emphasizing cost-effectiveness, operational productivity, responsible budgeting, and efficient resource utilization. Regular financial and operational performance assessments should be conducted to ensure that institutional resources generate measurable value while maintaining academic service quality and operational effectiveness.
4. **Promote Sustainable Institutional Performance.** Higher education institutions should integrate financial sustainability, operational effectiveness, academic service quality, and institutional resilience into their strategic development plans. The establishment of measurable institutional performance indicators and continuous monitoring systems is recommended to strengthen evidence-based decision-making, organizational adaptability, and long-term institutional viability.

ISSN No. 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XV Issue XI November 2026

5. **Integrate AI-Enabled Management Accounting, TQM, and Economic Efficiency.** Institutional policymakers and administrators should establish an integrated management framework connecting AI-driven financial systems, quality assurance practices, and economic efficiency indicators. This integration should support coordinated strategic planning, effective resource allocation, continuous institutional improvement, and sustainable organizational development. Particular attention should be given to strengthening the mediating role of economic efficiency in translating technological and quality management practices into improved institutional performance.
6. **Directions for Future Research.** Future researchers are encouraged to extend the investigation to a broader and more representative sample of Philippine higher education institutions across different geographical locations and institutional classifications. Longitudinal and mixed-methods research designs are recommended to examine changes in institutional management practices over time and provide stronger evidence regarding the direction of relationships among the study variables. Future studies may also investigate the influence of institutional classification, digital readiness, organizational culture, leadership capabilities, and technological infrastructure on economic efficiency and sustainable institutional performance. The use of multiple data sources and objective institutional performance indicators is further recommended to strengthen the validity, reliability, and generalizability of research findings.

Overall, the study emphasizes the strategic importance of integrating AI-enabled management accounting, systematic quality management, and economic efficiency to strengthen sustainable institutional performance. The findings provide a foundation for evidence-based management strategies that promote financial accountability, operational excellence, educational quality, and institutional resilience. Through coordinated technological innovation, continuous improvement, and effective resource utilization, Philippine higher education institutions can strengthen their capacity to achieve sustainable organizational development and long-term institutional effectiveness.

## REFERENCES

1. Bartolome, E. F., Batugal, R. A. F., Borja, P. D. A., Esnada, V. J. A., Lagasca, A. M. C., & Soriano, J. L. R. (2024). The use of management accounting strategies as a tool for decision-making in higher educational institutions. International Journal of Research and Innovation in Social Science, 8(5), 1564–1590. https://doi.org/10.47772/IJRISS.2024.805112
2. Bayudan-Dacuycuy, C., Flores, H., & Uy, A. O. (2024). Financial sustainability of higher education institutions in the Philippines: Issues, challenges, and opportunities (Discussion Paper Series No. 2024-24). Philippine Institute for Development Studies. https://doi.org/10.62986/dp2024.24
3. Hair, J., & Alamer, A. (2022). Partial least squares structural equation modeling (PLS-SEM) in second language and education research: Guidelines using an applied example. Research Methods in Applied Linguistics, 1(3), Article 100027. https://doi.org/10.1016/j.rmal.2022.100027
4. Hamdan, A., Hamdan, S., Alsyouf, I., Murad, N., Abdelrazeq, M., Al-Ali, S., & Bettayeb, M. (2024). Enhancing sustainability performance of universities: A DMAIC approach. Systems Research and Behavioral Science, 41(1), 153–172. https://doi.org/10.1002/sres.2942
5. Murphy, B., Feeney, O., Rosati, P., & Lynn, T. (2024). Exploring accounting and AI using topic modelling. International Journal of Accounting Information Systems, 55, Article 100709. https://doi.org/10.1016/j.accinf.2024.100709
6. Ringle, C. M., Sarstedt, M., Sinkovics, N., & Sinkovics, R. R. (2023). A perspective on using partial least squares structural equation modelling in data articles. Data in Brief, 48, Article 109074. https://doi.org/10.1016/j.dib.2023.109074
7. Ülker, N. (2023). Total quality management in the context of university 4.0: New game new rules. Frontiers in Education, 8, Article 1146965. https://doi.org/10.3389/feduc.2023.1146965
8. Yusuf, F. A. (2023). Total quality management (TQM) and quality of higher education: A meta-analysis study. International Journal of Instruction, 16(2), 161–178. https://doi.org/10.29333/iji.2023.16210a