

TEACHING AUDIT SYSTEMS MODEL FOR ENHANCING QUALITY ASSURANCE IN PUBLIC UNIVERSITIES IN YUNNAN PROVINCE*

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Abstract

The Teaching Audit System (TAS) refers to China's Ministry of Education-led undergraduate education and teaching audit evaluation mechanism for improving undergraduate quality assurance. Although TAS has become a national instrument for quality assurance, limited empirical research has examined how its policy requirements are translated into internal quality assurance capacity in regional public universities. This article identifies TAS implementation challenges, validates its multidimensional measurement structure, and examines its contribution to Quality Assurance outcomes in public universities in Yunnan Province, China. A quantitative research design was employed, using 400 valid questionnaire responses from administrators and teachers. Descriptive statistics, reliability and validity testing, Confirmatory Factor Analysis, structural equation modeling, and regression analysis were conducted.

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The CFA results supported an eight-dimensional TAS structure with acceptable model fit, $\chi^2/df = 2.657$, CFI = 0.936, TLI = 0.942, RMSEA = 0.064, and SRMR = 0.031. Regression analysis showed that TAS dimensions explained 45.4% of the variance in Quality Assurance outcomes, $R^2 = 0.454$, adjusted $R^2 = 0.443$, $F = 40.678$, $p < .001$. The findings indicate that TAS enhances quality assurance primarily through internal teaching quality management, faculty development, data governance, organizational learning, and audit culture. The study contributes an empirically validated TAS-QA model for explaining how national audit evaluation can be transformed into internal quality assurance capacity in regional public universities.

Keywords: Teaching Audit System Model, Quality Assurance, Confirmatory Factor Analysis, Chinese Public Universities in Yunnan Province

Introduction

The Teaching Audit System (TAS) in this study refers to China's Ministry of Education-led undergraduate education and teaching audit evaluation mechanism. It is a national evaluation system for regular undergraduate institutions, designed to promote institutional self-evaluation, expert review, rectification, follow-up supervision, and continuous improvement in undergraduate education quality (Ministry of Education of China, 2021). This policy orientation positions TAS as an authoritative mechanism connecting national evaluation requirements with university-level quality improvement, rather than as a routine teaching inspection. Bie (2021) further explains that the new round of audit evaluation emphasizes classification, quality assurance, online evaluation, and rectification, reflecting a shift from compliance-oriented review to improvement-oriented evaluation.

For regional public universities, the central issue is not whether national audit evaluation exists, but whether its requirements can be translated into

internal quality assurance capacity. Quality assurance research shows that evaluation has institutional value only when it is embedded in university management and connected with continuous improvement, rather than remaining an isolated compliance activity (Seyfried & Pohlenz, 2018; Manatos et al., 2017). This translation problem is especially relevant to Yunnan Province, where public undergraduate universities differ in institutional mission, resource conditions, governance capacity, data use, faculty development, and quality culture.

Existing TAS studies have mainly focused on policy interpretation and implementation experience, while limited empirical research has examined TAS as a measurable multidimensional quality assurance construct. This study addresses this gap by using main questionnaire data from public undergraduate universities in Yunnan Province to validate the TAS structure through Confirmatory Factor Analysis and examine its contribution to Quality Assurance outcomes. By linking national audit evaluation with measurable quality assurance outcomes, this study advances the discussion from policy description to empirical model validation and contributes to the broader debate on how external quality evaluation can be transformed into internal governance capacity in higher education.

Objectives

1. To identify the implementation status and quality assurance challenges of the Teaching Audit System in public universities in Yunnan Province, China.
2. To validate the multidimensional measurement structure of the Teaching Audit System through Confirmatory Factor Analysis.
3. To examine the effects of validated TAS dimensions on Quality Assurance outcomes and develop a TAS-QA model for regional public universities.

Literature Review

The institutional basis for conceptualizing the Teaching Audit System (TAS) comes first from China's Ministry of Education-led undergraduate education and teaching audit evaluation policy. The current audit evaluation framework emphasizes institutional self-evaluation, expert review, feedback-based rectification, follow-up supervision, and continuous improvement, which establishes TAS as a national quality assurance mechanism rather than a routine teaching inspection (Ministry of Education of China, 2021). These policy requirements directly justify the inclusion of Implementation Effectiveness, because TAS depends on whether audit procedures, institutional self-evaluation, rectification, and follow-up improvement can be effectively implemented. They also support Professional Audit Capacity, since expert review and professional judgment are central to the credibility of audit evaluation. Chinese research on the new round of undergraduate audit evaluation further emphasizes classification, quality assurance, online evaluation, and rectification, indicating a transition from compliance-oriented inspection to improvement-oriented evaluation (Bie, 2021). Therefore, TAS needs to be examined not only as a policy requirement, but also as an institutional mechanism involving implementation capacity, professional review, and internal quality assurance management.

Higher education quality assurance literature provides the theoretical basis for the internal governance dimensions of TAS. Quality assurance has increasingly been understood as an institutional process embedded in teaching management, stakeholder engagement, and continuous improvement rather than as external control alone. Seyfried and Pohlenz (2018) show that the effectiveness of quality assurance depends on institutional conditions and actors' engagement, while Manatos, Sarrico, and Rosa (2017) argue that quality management gains value when integrated into the university's overall management system. These studies support Teaching Quality Assurance and

Management as the central internal governance dimension of TAS. At the same time, quality assurance must be linked to the core academic processes of undergraduate education. The Standards and Guidelines for Quality Assurance in the European Higher Education Area emphasize learning and teaching, programme design, student-centred learning, teaching staff, learning resources, and information management as key areas of internal quality assurance (European Association for Quality Assurance in Higher Education, 2015). This provides a direct rationale for Curriculum Relevance and Alignment and Faculty Development and Teaching Capacity. Curriculum alignment is further supported by constructive alignment theory, which links intended learning outcomes, teaching activities, assessment, and student performance in curriculum design (Biggs, 1996). Faculty development is also an important quality improvement mechanism, as empirical research shows that training and professional development can improve university teachers' teaching approaches and instructional effectiveness (Gibbs & Coffey, 2004).

The inclusion of Data Governance, Organizational Learning, and Audit Culture is supported by literature on evidence-based governance, organizational improvement, and quality culture. Data Governance is necessary because audit-based quality assurance requires reliable evidence, systematic monitoring, and data-informed decision-making. Khatri and Brown (2010) define data governance as the specification of decision rights and accountabilities for data-related processes, which supports its role as the evidential foundation for quality judgment and institutional improvement. Organizational Learning is included because audit feedback contributes to quality assurance only when institutions can interpret, share, and institutionalize improvement knowledge. Crossan, Lane, and White (1999) explain organizational learning as a process linking individual, group, and organizational levels, which provides a theoretical basis for understanding how audit feedback becomes institutional learning. Audit Culture

is supported by research on quality culture in higher education. Harvey and Stensaker (2008) argue that quality culture is connected with quality improvement and the fundamental processes of teaching and learning, while Bendermacher et al. (2017) identify leadership, communication, and organizational context as important conditions for quality culture development. These studies justify Audit Culture as a necessary condition for transforming TAS from formal compliance into developmental quality improvement.

Taken together, the literature supports TAS as an interrelated quality governance structure rather than a set of separate administrative indicators. Implementation Effectiveness and Professional Audit Capacity form the operational and professional foundation of audit evaluation. Teaching Quality Assurance and Management, Curriculum Relevance and Alignment, and Faculty Development and Teaching Capacity constitute the internal teaching improvement mechanism through which audit requirements are translated into educational quality enhancement. Data Governance provides the evidential basis for quality judgment and institutional decision-making, while Organizational Learning and Audit Culture explain how audit feedback is interpreted, shared, and institutionalized as continuous improvement. Therefore, the expected relationship is not a simple direct effect from national audit policy to QA outcomes, but a structured process in which audit implementation, internal quality management, evidence-based governance, organizational learning, and quality culture jointly contribute to Quality Assurance outcomes. This literature-based structure provides the rationale for the measurement model and structural model used in this study. The measurement model examines whether the eight TAS dimensions can validly represent the latent structure of TAS through Confirmatory Factor Analysis. CFA is appropriate for validating latent constructs measured by observed indicators (Boateng et al., 2018; Schreiber et al., 2006). After the measurement model is established, the structural model examines how the validated TAS dimensions contribute to Quality Assurance outcomes,

following SEM principles that measurement validity should be confirmed before interpreting structural relationships among latent constructs (Fornell & Larcker, 1981; Schreiber et al., 2006).

Methodology

Research Design: A quantitative research design was employed. CFA was used to validate the TAS measurement model. Structural equation modeling examined structural paths among TAS dimensions, Data Governance, Organizational Learning, and Quality Assurance outcomes, while regression analysis additionally tested the explanatory contribution of validated TAS dimensions to Quality Assurance outcomes.

Population and Sample Group: The study covered 25 public universities in Yunnan Province, China. The main questionnaire sample included 400 valid responses from administrators and teachers, including faculty members, university administrators, teaching management personnel, quality assurance staff, and department-level staff involved in undergraduate teaching management, quality assurance, or TAS-related activities. These responses were used for CFA, structural equation modeling, and regression analysis. The sample was appropriate for model validation because all respondents were institutional actors directly related to undergraduate teaching management, quality assurance, or TAS implementation.

Table 1 Demographic Characteristics of the Questionnaire Respondents

Respondent Characteristic	Category	Frequency (n)	Percentage (%)
Gender	Female	240	60.00
	Male	160	40.00
Age	Below 30	81	20.25
	30–39	178	44.50
	40–49	104	26.00
	50–59	37	9.25
Current Position	Teachers	260	65.00
	Administrators	140	35.00
Highest Educational Qualification	Bachelor's degree	25	6.25
	Master's degree	231	57.75
	Doctoral degree	144	36.00
Participation in Teaching Audit Activities	Yes, directly involved	175	43.75
	Yes, indirectly involved	225	56.25
Familiarity with Teaching Audit System (TAS)	Familiar	151	37.75
	Neutral	218	54.50
	Unfamiliar	21	5.25
	Very familiar	10	2.50
Total		400	100.00

Research Instruments: The main TAS-QA questionnaire was developed based on China's undergraduate education and teaching audit evaluation policy, higher education quality assurance literature, and the eight-dimensional TAS construct established in the literature review. It measured Implementation Effectiveness, Teaching Quality Assurance and Management, Professional Audit Capacity, Curriculum Relevance and Alignment, Faculty Development and Teaching Capacity, Data Governance, Organizational Learning, Audit Culture, and Quality Assurance outcomes using a five-point Likert scale. The questionnaire

items were localized to the Chinese higher education context and reviewed for content relevance, conceptual clarity, and contextual suitability before formal data collection.

Data Collection and Analysis: The main questionnaire was administered to respondents familiar with teaching management, quality assurance, or TAS implementation in public universities in Yunnan Province. After screening, 400 valid responses were retained for analysis. Descriptive statistics, reliability and validity testing, CFA, convergent and discriminant validity assessment, structural equation modeling, and regression analysis were conducted. CFA was used to validate the measurement model. Structural equation modeling examined the structural relationships among validated TAS dimensions, Data Governance, Organizational Learning, and Quality Assurance outcomes, while regression analysis tested the explanatory contribution of TAS dimensions to Quality Assurance outcomes.

Results

1. Descriptive Results of TAS Implementation and QA Outcomes

Overall TAS perception was relatively high ($M = 4.121$, $SD = 0.658$), indicating broad recognition of TAS in undergraduate quality assurance. Professional Audit Capacity recorded the highest mean score ($M = 4.326$, $SD = 0.602$), while Implementation Effectiveness was the lowest ($M = 3.602$, $SD = 0.674$). Data Governance ($M = 3.835$, $SD = 0.683$) and Audit Culture ($M = 3.871$, $SD = 0.702$) were also comparatively lower. The pattern points to institutional recognition of TAS, alongside weaker translation into implementation routines, evidence-based governance, and developmental audit culture. Thus, the main challenge is not the existence of audit evaluation, but its internal transformation into sustainable quality assurance capacity.

Table 2 Descriptive Statistics of TAS Dimensions and QA Outcomes

Code	Minimum	Maximum	Mean	SD	Median
TAS	2.000	5.000	4.121	0.658	4.000
IE	2.000	5.000	3.602	0.674	3.792
TQA	2.000	5.000	4.025	0.611	4.000
PAC	1.000	5.000	4.326	0.602	4.167
CRA	1.500	5.000	4.045	0.614	4.000
FD	2.000	5.000	4.058	0.615	4.000
DG	2.000	5.000	3.835	0.683	4.000
OL	1.000	5.000	4.094	0.895	4.083
AC	2.000	5.000	3.871	0.702	4.000
QA	2.000	5.000	4.093	0.690	4.000

Note. TAS = overall TAS perception; IE = Implementation Effectiveness; TQA = Teaching Quality Assurance and Management; PAC = Professional Audit Capacity; CRA = Curriculum Relevance and Alignment; FD = Faculty Development and Teaching Capacity; DG = Data Governance; OL = Organizational Learning; AC = Audit Culture; QA = Quality Assurance outcomes.

2. Reliability and Validity of the Main TAS-QA Questionnaire

The main TAS-QA questionnaire showed strong reliability and suitability for factor-based validation. The KMO value was 0.962, and Bartlett's Test of Sphericity was significant, $\chi^2 = 68811.177$, $df = 6670$, $p < .001$. The cumulative variance explained reached 80.876%, indicating adequate structural explanatory power. As shown in Table 3, Cronbach's alpha values ranged from 0.884 to 0.937, AVE values from 0.723 to 0.867, and CR values from 0.957 to 0.987. The instrument therefore met the reliability and convergent validity requirements for CFA-based model validation.

Table 3 Reliability and Validity of the Main TAS-QA Questionnaire

3. CFA Results of the TAS Measurement Model

Construct			Code	Number of Items	Cronbach's α	Corrected Item-Total Correlation	AVE	CR
Implementation			IE	12	0.926	0.652–0.789	0.825	0.983
Teaching	Quality	TQA	12	0.933	0.681–0.802	0.74	0.972	
Professional	Audit	PAC	12	0.918	0.633–0.766	0.738	0.971	
Curriculum Relevance		CRA	12	0.921	0.647–0.775	0.723	0.969	
Faculty	Development	FD	12	0.935	0.694–0.813	0.781	0.977	
Data Governance		DG	12	0.907	0.612–0.741	0.812	0.981	
Organizational		OL	12	0.914	0.628–0.758	0.867	0.987	
Audit Culture		AC	12	0.929	0.663–0.796	0.812	0.981	
Quality	Assurance	QA	12	0.937	0.698–0.821	0.797	0.979	
Overall	TAS	TAS	8	0.884	0.596–0.723	0.738	0.957	

Note. AVE = Average Variance Extracted; CR = Composite Reliability.

Confirmatory Factor Analysis was conducted to validate the multidimensional TAS measurement structure. As shown in Table 4, the model achieved acceptable fit: $\chi^2/df = 2.657$, GFI = 0.914, AGFI = 0.930, CFI = 0.936, TLI = 0.942, RMSEA = 0.064, and SRMR = 0.031. Although the chi-square test was significant, this result is sensitive to sample size and model complexity. The remaining fit indices, including CFI = 0.936, TLI = 0.942, RMSEA = 0.064, and SRMR = 0.031, indicated acceptable model fit and supported the adequacy of the measurement model for subsequent structural analysis. The CFA evidence supports TAS as an empirically measurable eight-dimensional quality assurance governance structure, covering implementation, teaching management, professional audit capacity, curriculum alignment, faculty development, data governance, organizational learning, and audit culture.

Table 4 CFA Model Fit Indices of the TAS Measurement Model

Fit Index	Recommended Criterion	Result	Interpretation
χ^2	—	17294.194	—
df	—	6509	—
p-value	> 0.05	0.000	Sensitive to sample size
χ^2/df	< 3	2.657	Acceptable
GFI	> 0.90	0.914	Acceptable
RMSEA	< 0.10	0.064	Acceptable
RMR	< 0.05	0.017	Good
CFI	> 0.90	0.936	Acceptable
NFI	> 0.90	0.974	Good
NNFI	> 0.90	0.942	Acceptable
TLI	> 0.90	0.942	Acceptable
AGFI	> 0.90	0.930	Acceptable
IFI	> 0.90	0.986	Good
PGFI	> 0.50	0.713	Acceptable
PNFI	> 0.50	0.755	Acceptable
PCFI	> 0.50	0.825	Acceptable
SRMR	< 0.10	0.031	Good

Note. GFI = Goodness-of-Fit Index; AGFI = Adjusted Goodness-of-Fit Index; RMSEA = Root Mean Square Error of Approximation; RMR = Root Mean Square Residual; CFI = Comparative

Fit Index	Recommended Criterion	Result	Interpretation
Fit Index; NFI = Normed Fit Index; TLI = Tucker-Lewis Index; IFI = Incremental Fit Index; SRMR = Standardized Root Mean Square Residual.			

4. Structural Effects among TAS Dimensions and QA Outcomes

After the CFA-based measurement model was validated, structural analysis examined the effects of TAS dimensions on Data Governance, Organizational Learning, and Quality Assurance outcomes. As shown in Table 5, all paths were statistically significant, confirming the explanatory role of TAS dimensions in both intermediate governance mechanisms and final QA outcomes.

For Data Governance, Faculty Development had the strongest effect ($\beta = 0.197$, $p < .001$), followed by Curriculum Relevance and Alignment ($\beta = 0.182$, $p < .001$) and Audit Culture ($\beta = 0.155$, $p = .002$). For Organizational Learning, Professional Audit Capacity was the strongest predictor ($\beta = 0.230$, $p < .001$), followed by Teaching Quality Assurance and Management ($\beta = 0.197$, $p < .001$) and Audit Culture ($\beta = 0.195$, $p < .001$). For QA outcomes, Teaching Quality Assurance and Management had the strongest direct effect ($\beta = 0.204$, $p < .001$), followed by Faculty Development ($\beta = 0.194$, $p < .001$). These patterns indicate that DG and OL function as important governance and learning mechanisms within the TAS-QA relationship. They also show that TAS affects QA through both direct quality management effects and indirect institutional capacity-building pathways. Taken together, the paths suggest that TAS enhances QA through internal quality management, faculty development, evidence-based governance, organizational learning, and audit culture, rather than through formal audit execution alone. Regression analysis further confirmed the explanatory contribution of TAS dimensions to QA outcomes, with the model explaining 45.4% of the variance, $R^2 = 0.454$, adjusted $R^2 = 0.443$, $F = 40.678$, $p < .001$.

Table 5 Structural Effects among TAS Dimensions and QA Outcomes

Structural Path	Standardiz	Estimate	S.E.	C.R.	p-value
	ed Estimate				
DG ← CRA	0.182	0.225	0.062	3.633	***
DG ← IE	0.115	0.248	0.11	2.244	0.025
DG ← TQA	0.130	0.151	0.06	2.531	0.011
DG ← PAC	0.103	0.116	0.055	2.118	0.034
DG ← FD	0.197	0.232	0.061	3.783	***
DG ← AC	0.155	0.151	0.048	3.128	0.002
OL ← CRA	0.120	0.197	0.084	2.36	0.018
OL ← IE	0.109	0.313	0.15	2.087	0.037
OL ← TQA	0.197	0.354	0.081	3.858	***
OL ← PAC	0.230	0.347	0.076	4.569	***
OL ← FD	0.132	0.372	0.083	3.925	***
OL ← AC	0.195	0.254	0.066	3.84	***
QA ← CRA	0.098	0.118	0.059	1.992	0.046
QA ← IE	0.119	0.251	0.106	2.367	0.018
QA ← TQA	0.204	0.232	0.058	4.013	***
QA ← PAC	0.097	0.107	0.054	1.994	0.046
QA ← FD	0.194	0.312	0.059	3.906	***
QA ← AC	0.109	0.104	0.047	2.206	0.027
QA ← DG	0.103	0.101	0.049	2.042	0.041
QA ← OL	0.115	0.084	0.036	2.358	0.018

Note. C.R. = Critical Ratio, not Composite Reliability. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

IE = Implementation Effectiveness; TQA = Teaching Quality Assurance and Management; PAC = Professional Audit Capacity; CRA = Curriculum Relevance and Alignment; FD = Faculty Development and Teaching Capacity; AC = Audit Culture; DG = Data Governance; OL = Organizational Learning; QA = Quality Assurance.

Discussion

1. TAS Authority and Internal Quality Transformation

The relatively high overall TAS perception reflects the institutional authority of TAS in Chinese public universities. However, the lower scores for Implementation Effectiveness, Data Governance, and Audit Culture indicate a policy-practice gap in which national evaluation authority does not automatically translate into internal quality assurance capacity. For regional public universities, the key challenge is to convert TAS from an external audit requirement into routine quality governance, evidence-based decision-making, and continuous improvement. This finding suggests that symbolic or formal compliance may persist when audit requirements are not embedded in stable institutional routines, data systems, and developmental quality culture. This interpretation is consistent with quality assurance research, which links evaluation effectiveness to institutional management and improvement processes (Seyfried & Pohlenz, 2018; Manatos et al., 2017).

2. CFA Evidence for TAS as a Multidimensional QA Structure

The CFA evidence gives empirical form to TAS as a multidimensional quality assurance structure. The acceptable model fit indices confirm that eight dimensions jointly constitute the TAS measurement model: Implementation Effectiveness, Teaching Quality Assurance and Management, Professional Audit Capacity, Curriculum Relevance and Alignment, Faculty Development and Teaching Capacity, Data Governance, Organizational Learning, and Audit Culture. The contribution lies in moving TAS research beyond policy description toward empirical validation of a structured quality governance construct.

3. Mechanisms Linking TAS to QA Outcomes

The structural paths further specify the mechanisms through which TAS relates to Quality Assurance outcomes. Teaching Quality Assurance and Management had the strongest direct effect, indicating that TAS works primarily

through internal teaching quality systems rather than through formal evaluation procedures alone. Faculty Development and Teaching Capacity also had a strong effect, showing that audit feedback contributes to QA outcomes when it is translated into teacher development and instructional improvement. Implementation Effectiveness reflects audit execution and rectification, Data Governance provides the evidence base for quality judgment, and Organizational Learning and Audit Culture explain how feedback becomes sustained institutional improvement rather than short-term compliance. Overall, the TAS-QA linkage operates through implementation capacity, internal quality management, evidence use, organizational learning, and quality culture. This result is consistent with international quality assurance research emphasizing the integration of external evaluation with internal institutional management, while also highlighting the specific challenge of regional universities where governance capacity and resource conditions are uneven.

Body of Knowledge

The CFA and structural results lead to a TAS-QA Structural Model for regional public universities. The model explains that national audit evaluation does not directly produce QA outcomes; rather, its effects are filtered through institutional implementation, professional audit capacity, internal teaching quality management, data governance, organizational learning, and audit culture. The systemic contribution of the model lies in connecting external evaluation authority with internal institutional transformation. It extends existing quality assurance frameworks by showing how regional public universities convert national audit requirements into evidence-based governance, teaching improvement, and continuous quality enhancement.

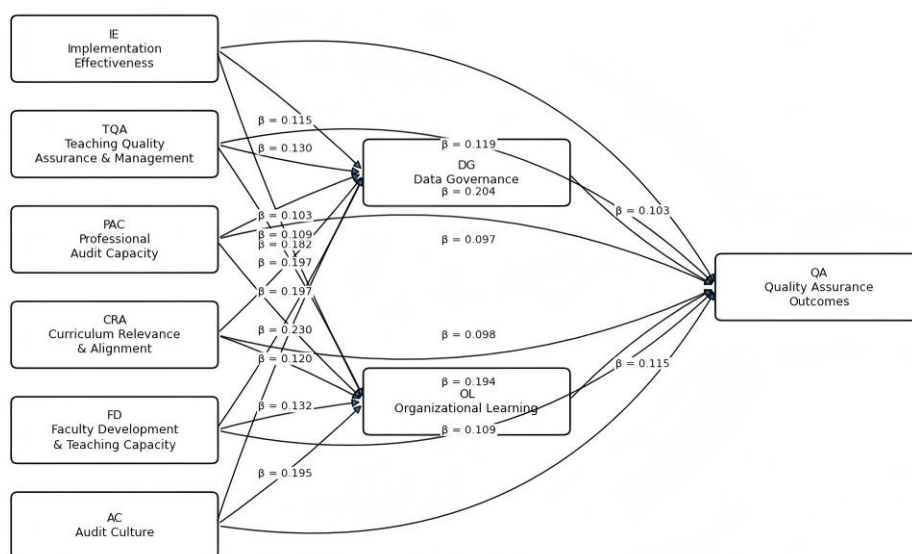


Figure 1 TAS-QA Structural Model

Recommendations

1. Practical Recommendations for Public Universities

Public universities should prioritize the internal mechanisms that showed stronger empirical effects in this study. Since Teaching Quality Assurance and Management and Faculty Development had the strongest direct effects on QA outcomes, universities should use TAS feedback to strengthen teaching monitoring, curriculum review, faculty development, and instructional improvement. At the same time, weaker areas such as Implementation Effectiveness, Data Governance, and Audit Culture should be improved through clearer rectification procedures, integrated teaching data systems, and a developmental audit culture that supports participation, reflection, and continuous improvement. In this way, TAS can move beyond periodic evaluation preparation and become a routine mechanism for continuous quality improvement.

2. Recommendations for Future Research

Future research should test the TAS-QA model in other Chinese provinces and compare how regional governance capacity, institutional mission, resource conditions, and data infrastructure influence TAS implementation. Mixed-method studies are also needed to examine the institutional micro-processes behind audit compliance, including how universities interpret audit feedback, allocate internal responsibilities, and convert rectification requirements into teaching improvement. Longitudinal research should further investigate whether the structural paths identified in this study remain stable across multiple audit evaluation cycles. Future studies may also examine the mediating or moderating roles of Data Governance, Organizational Learning, and Audit Culture in the TAS-QA relationship.

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