

Factors Influencing the Success of the Education Service Industry Management in Zhejiang Province

Yupeng Sang¹, Tongtang Tonglim², Chertchai Thurapaeng^{3*}

¹Program of Industrial Technology Management, Faculty of Industrial Technology, Muban Chombueng Rajabhat University, Thailand.

²Program of Industrial Technology Management, Faculty of Industrial Technology, Muban Chombueng Rajabhat University, Thailand.

³Program of Industrial Technology Management, Faculty of Industrial Technology, Muban Chombueng Rajabhat University, Thailand.

*Corresponding Author's Email: cnr.tantiwat@gmail.com

Abstract: This research presents the full dissertation-based study of factors influencing the success of education service industry management in Zhejiang Province, China. The objectives were to study and clarify key success factors of G12 educational service institutions, analyze those factors by structural equation modeling, and implement the resulting model with stakeholders. The study used a mixed-methods design. Quantitative data were collected from 385 valid stakeholder responses to questionnaires related to G12 educational service institutions, and qualitative data were obtained through in-depth interviews with students, parents, administrators, and instructors. A stakeholder implementation assessment was also conducted with 30 respondents. The model included teaching quality, market competitiveness, student academic support, educational service management, and parent satisfaction. After model refinement, the structural model showed acceptable fit with the empirical data: $\chi^2/df = 2.96$, CFI = 0.98, GFI = 0.91, AGFI = 0.91, RFI = 0.91, NFI = 0.90, TLI = 0.92, RMSEA = 0.07, and RMR = 0.07. The model explained 57.4% of the variance in parent satisfaction. Total-effect results showed that market competitiveness had the strongest influence, followed by teaching quality, educational service management, and student academic support. The total-effects equation was $PS = 0.755TQ + 0.945MC + 0.577AS + 0.721EM$. The implementation results confirmed the high suitability of all model components. The study concludes that education service success in Zhejiang depends on the integrated management of market strength, instructional quality, academic support, technology-enabled management, and parent-centered service response.

Keywords: Structural Equation Modeling, Education Service Industry, G12 Education, Parent Satisfaction, Market Competitiveness

1. Introduction

Zhejiang Province represents a significant case for studying the management success of the education service industry because it combines economic dynamism, strong family investment in education, and intense competition for high-quality learning opportunities. At the G12 level, educational services are closely connected with university entrance preparation, academic performance improvement, and long-term educational mobility. Families do not evaluate educational service institutions only by tuition cost or school reputation; they evaluate whether institutions can deliver measurable academic value, communicate progress clearly, and manage learning support efficiently. This context is consistent with research on educational quality, equity, and family investment in educational opportunities in China (Guo et al., 2019; Ma & Wright, 2023; Wood, 2023).

The success of G12 educational service institutions therefore requires a model that can explain multiple interacting factors. Teaching quality may improve learning engagement, but it may not be sufficient if institutions lack



market visibility or management competency. Academic support may help students prepare for examinations, but parents must also receive meaningful feedback and perceive service value. Market competitiveness may attract families, but it must be supported by instructional quality and integrated service management. These relationships suggest that success is structural rather than linear, which agrees with studies emphasizing teaching quality, competitiveness, parent satisfaction, and service quality as interrelated dimensions of educational success (Blagireva, 2015; Latif et al., 2019; Lindberg, 2023).

Structural equation modeling is suitable for this problem because it allows the researcher to analyze latent variables, observed indicators, direct effects, indirect effects, and total effects within a single model. This study presents the full analysis, including measurement validation, SEM fit, causal effects, hypothesis testing, implementation assessment, and qualitative support. This approach follows the recommended use of SEM for testing measurement models, structural paths, and theory-based relationships among latent constructs (Anderson & Gerbing, 1988; Byrne, 2016; Kline, 2023; Schumacker & Lomax, 2016).

2. Research Objectives

- 1) To study and clarify the key success factors of G12 educational service institutions in Zhejiang Province.
- 2) To analyze key success factors of G12 educational service institutions in Zhejiang Province by structural equation modeling.
- 3) To implement the models of key success factors of G12 educational service institutions in Zhejiang Province.

3. Literature Review

3.1 Education Service Management as an Integrated System

Education service management can be defined as the planning, organization, delivery, monitoring, and improvement of educational services for students, parents, instructors, and other stakeholders. In the G12 context, it includes more than classroom management. It covers technology-supported communication, coordination of tutoring and academic support, parent feedback, curriculum alignment, resource allocation, and institutional positioning. The literature on service quality and educational management suggests that service success emerges when teaching quality and administrative systems work together (Latif et al., 2019; Singh et al., 2023; Yurkofsky, 2022).

In Zhejiang Province, this integrated view is particularly important because educational service institutions operate in a competitive environment. Parents expect institutions to improve academic readiness, provide reliable feedback, and offer additional advantages for university entrance. Therefore, an education service management model must connect academic quality, stakeholder satisfaction, competitive positioning, and organizational capability. This linkage is consistent with the dissertation's matrix of concepts and observed factors, which connects teaching quality, market competitiveness, academic support, parent satisfaction, and educational service management with previous research (Blagireva, 2015; Li et al., 2022; Lindberg, 2023).

3.2 Teaching Quality and Student Academic Support

Teaching quality is widely recognized as a primary determinant of educational service value. It is reflected in the use of effective teaching methods, suitable educational levels, and course design that responds to student needs. In G12 educational service institutions, teaching quality is expected to strengthen engagement, critical thinking, problem-solving, and readiness for higher education. These indicators are supported by prior studies emphasizing instructional quality, teacher quality, clear explanation, class preparation, and teacher motivation in relation to learning achievement and teaching effectiveness (Hartl & Holzberger, 2022; Latif et al., 2019; Ruiz-Esteban & Santos del Cerro, 2020; Sanfo & Malgoubri, 2023; Thommen et al., 2021).

Student academic support complements teaching quality by providing the resources and learning mechanisms that help students sustain progress. In this study, academic support includes resource availability, tutoring programs,

and continuing study programs. These components are important because students preparing for university entrance often require additional guidance beyond regular classroom instruction. Academic support also affects parent confidence because visible support systems provide evidence that the institution is actively helping students overcome learning challenges. This interpretation is consistent with studies on academic guidance, learning resources, digital support, curriculum support, and equity of educational opportunity (Guo et al., 2019; Si, 2021; Singh et al., 2023; Wood, 2023; Zhou et al., 2023).

3.3 Market Competitiveness and Parent Satisfaction

Market competitiveness refers to the capacity of an educational service institution to differentiate itself, maintain market share, communicate a clear position, and apply competitive strategies. In a province with many educational choices, market competitiveness becomes a practical signal of institutional value. Families tend to trust institutions that have recognizable positioning, reliable reputation, and programs aligned with student and parent expectations. This view is supported by research on institutional competitiveness, marketing strategy, and the role of education consulting in family educational planning (Blagireva, 2015; Channuwong et al., 2026; Ma & Wright, 2023).

Parent satisfaction is a central outcome and mechanism in the education service industry. Parents are not only service users; they are decision-makers, evaluators, and reputation transmitters. Academic feedback and activity feedback help parents judge whether an institution supports both academic progress and holistic development. When parent satisfaction is high, institutions are more likely to retain students, receive positive recommendations, and sustain competitiveness. This is consistent with studies showing that satisfaction, trust, service performance, social environment, and communication are important in educational service evaluation (Li et al., 2022; Lindberg, 2023).

3.4 Structural Equation Modeling in Education Service Research

Structural equation modeling is appropriate when researchers need to examine relationships among multiple latent variables measured by observed indicators. SEM integrates measurement models and structural models, allowing researchers to evaluate construct validity and causal relationships at the same time. For education service research, this is valuable because constructs such as teaching quality, market competitiveness, academic support, parent satisfaction, and service management are abstract and cannot be measured directly by a single item. This methodological position is consistent with standard SEM literature on confirmatory factor analysis, model fit, construct reliability, and structural path testing (Anderson & Gerbing, 1988; Brown, 2015; Byrne, 2016; Hair et al., 2010; Hoyle, 2012; Kline, 2023; Schumacker & Lomax, 2016).

In this study, SEM was used to test how teaching quality, market competitiveness, and academic support influence educational service management and parent satisfaction. It also enabled the analysis of mediated effects through educational service management, thereby clarifying how upstream improvements in teaching, market strategy, and support services are converted into stakeholder satisfaction. This follows the logic of SEM as a method for testing direct, indirect, and total effects in a theory-guided model (Anderson & Gerbing, 1988; Kline, 2023; Schumacker & Lomax, 2016).

4. Methodology

This study employed a mixed-methods design consisting of quantitative SEM analysis, qualitative interview analysis, and stakeholder implementation assessment. The quantitative phase used structured questionnaires, the qualitative phase used semi-structured interviews, and the implementation phase collected stakeholders' opinions on the model's suitability and feasibility. This design is aligned with the full-text dissertation, which combined questionnaire data, in-depth interviews, and implementation evaluation to examine the success factors of Zhejiang's G12 educational service industry.

The quantitative sample comprised 385 valid responses from stakeholders of G12 educational service institutions in Zhejiang Province. The questionnaire measured five latent constructs: teaching quality (TQ), market competitiveness (MC), academic support (AS), parent satisfaction (PS), and educational service management (EM).

The observed variables were teaching methods, educational level, course design, market share, institution positioning, competitive strategy, resource availability, tutoring program, continuing study program, academic feedback, activity feedback, technology usage, integration, and management competency. The sampling logic is consistent with the dissertation's use of stratified sampling and finite-population sample-size calculation, while the sampling formula is supported by Yamane (1967).

Data analysis included descriptive statistics, normality testing, correlation analysis, confirmatory factor analysis, structural equation modeling, direct and indirect effect analysis, hypothesis testing, and model implementation assessment. The qualitative phase involved in-depth interviews with two students, three parents, three administrators, and three instructors. The implementation assessment involved 30 stakeholders who evaluated the suitability and possibility of the model components. The CFA and SEM procedures follow the logic of measurement validation, reliability assessment, and structural model testing recommended in applied SEM research (Brown, 2015; Hair et al., 2010; Kline, 2023).

Table 1 Summary of methodology used in this study

Phase	Participants/Data	Analysis	Purpose
Quantitative SEM survey	385 valid respondents	Descriptive statistics, CFA, SEM, effect analysis	Test measurement and structural relationships
Implementation assessment	30 stakeholders	Percentage agreement and suitability interpretation	Assess practical suitability and possibility
Qualitative interviews	11 key informants	Content analysis	Explain and triangulate quantitative findings

5. Conceptual and Structural Model

The final study presents the model in a modified visual form to avoid repeating the original dissertation diagram. Teaching quality, market competitiveness, and student academic support are treated as upstream managerial levers. Educational service management functions as the institutional management mechanism and mediator. Parent satisfaction is treated as the key success outcome because it reflects stakeholder acceptance, perceived service value, and institutional credibility. This arrangement is consistent with the dissertation's conceptual framework and related research matrix, in which teaching quality, market competitiveness, academic support, parent satisfaction, and educational service management are linked to prior studies (Blagireva, 2015; Latif et al., 2019; Li et al., 2022; Lindberg, 2023; Singh et al., 2023).

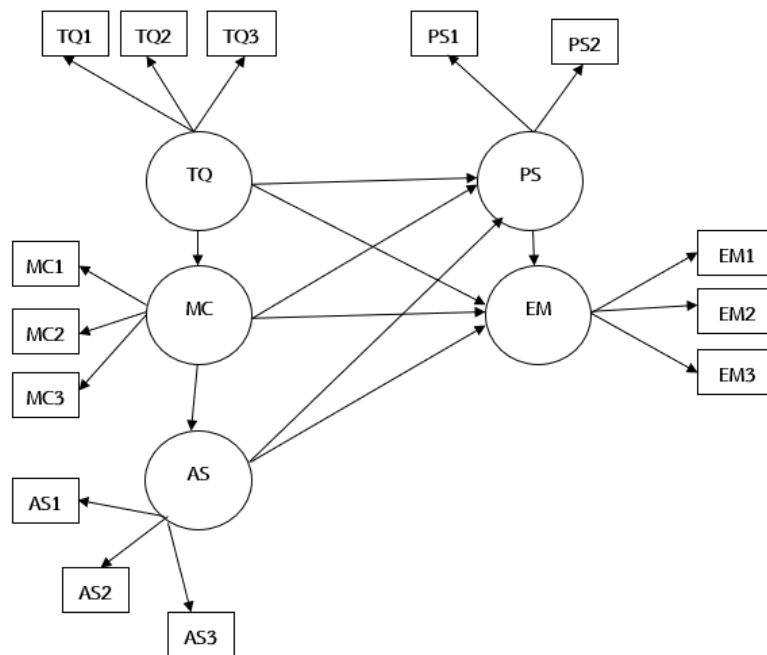


Figure 1 Modified SEM-based success model for G12 education service management

Figure 1 presents the modified SEM-based success model for G12 education service management in Zhejiang Province. The model shows that teaching quality, market competitiveness, and student academic support function as major upstream factors influencing parent satisfaction and educational service management. Teaching quality is measured through teaching methods, educational level, and course design, while market competitiveness is represented by market share, institutional positioning, and competitive strategy. Academic support includes resource availability, tutoring programs, and continuing study programs. Parent satisfaction is measured by academic feedback and activity feedback, whereas educational service management is reflected through technology usage, integration, and management competency. Overall, the figure explains that institutional success depends on the interaction among academic quality, competitive strategy, student support, parent response, and effective service management (Blagireva, 2015; Latif et al., 2019; Lindberg, 2023; Singh et al., 2023).

6. Research Results

6.1 Descriptive Results of Major Constructs

The descriptive results showed that all major constructs were evaluated at high or highest levels. Teaching quality had the highest mean score, followed by academic support. Market competitiveness, educational service management, and parent satisfaction were rated at high levels. These findings confirm that the model variables were relevant to respondents before proceeding to SEM testing. The same set of constructs is supported by the dissertation's instrument-development matrix and related research, which connects the variables to teaching quality, competitiveness, academic support, parent satisfaction, and management capability (Blagireva, 2015; Latif et al., 2019; Sanfo & Malgoubri, 2023; Singh et al., 2023).

Table 2 Descriptive construct profile used before SEM testing

Construct	Mean	Level	Interpretive Meaning
Teaching Quality	4.33	Highest	Strong instructional foundation

Academic Support	4.22	Highest	Strong support for resources and continuing study
Market Competitiveness	4.20	High	Competitive but still needs differentiation
Educational Service Management	4.19	High	Management competency and technology are important
Parent Satisfaction	4.17	High	Feedback and communication remain improvement priorities

6.2 Measurement Model Results

Initially, a structural equation model of factors influencing the success of the education service industry management in Zhejiang Province was processed, and the model revealed that most indices did not pass the criterion, as shown in Figure 2.

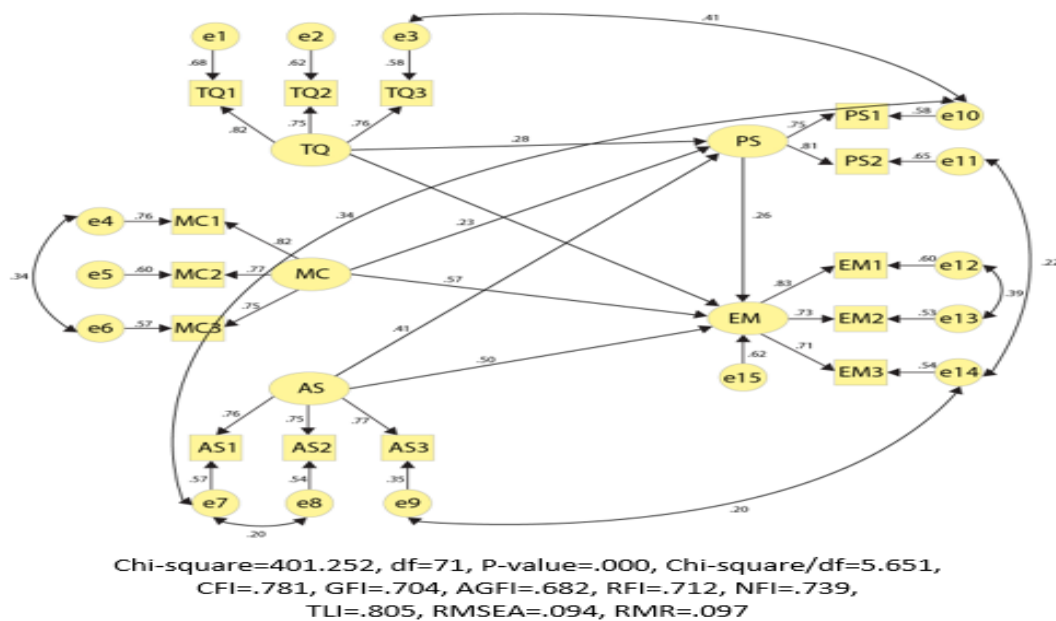


Figure 2 Initial results of structural equation model of factors influencing the success of the education service industry management in Zhejiang Province

The measurement model showed acceptable convergent validity and composite reliability. The AVE values ranged from 0.578 to 0.632, exceeding the 0.50 threshold, while the CR values ranged from 0.836 to 0.898, exceeding the 0.70 threshold. These results indicate that the observed indicators were adequate for representing their latent constructs. This interpretation follows SEM guidelines that use factor loadings, average variance extracted, and construct reliability to evaluate measurement quality (Brown, 2015; Hair et al., 2010; Kline, 2023; Schumacker & Lomax, 2016).

Table 3 Condensed measurement model results

Latent Construct	Observed Indicators	Loading Range	AVE	CR
Teaching Quality	TQ1, TQ2, TQ3	.764–.821	.625	.866
Market Competitiveness	MC1, MC2, MC3	.752–.868	.632	.873
Academic Support	AS1, AS2, AS3	.750–.811	.578	.836
Parent Satisfaction	PS1, PS2	.754–.812	.609	.898
Educational Service Management	EM1, EM2, EM3	.729–.833	.585	.846

6.3 Model Fit Results

The initial structural model did not fit the empirical data, as the fit indices failed to reach the recommended criteria. After theory-guided model modification, all model fit indices reached acceptable levels. This confirms that the modified model was appropriate for explaining the empirical relationships among factors influencing education service industry management success in Zhejiang Province. The modified structural equation model of factors influencing the success of the education service industry management in Zhejiang Province is shown in Figure 3. The use of multiple fit indices is consistent with SEM recommendations because no single index is sufficient to judge model adequacy (Byrne, 2016; Hair et al., 2010; Kline, 2023).

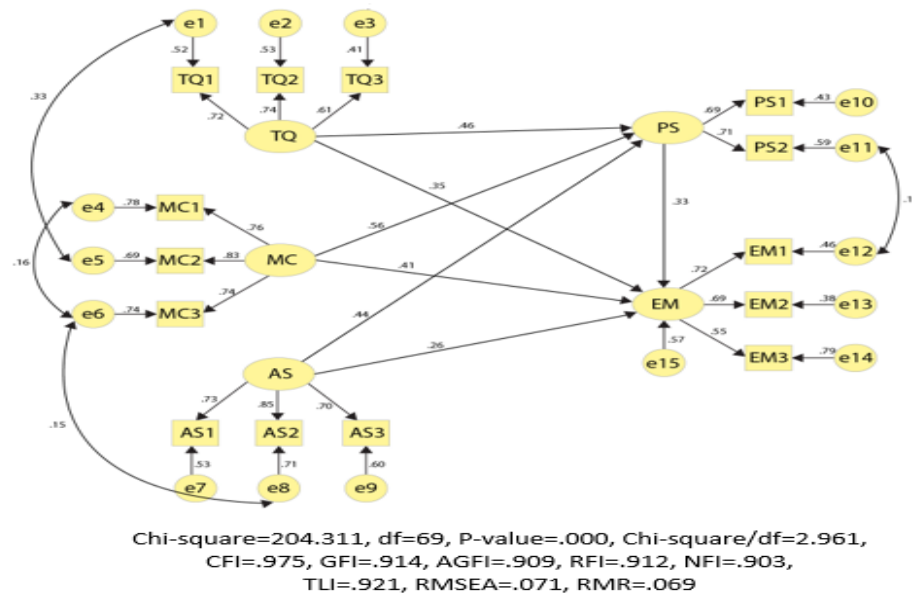


Figure 3 A modified structural equation model of factors influencing the success of the education service industry management in Zhejiang Province

Lastly, the results of the structural equation model analysis in Figure 3 above reveal factors influencing the success of the education service industry management in Zhejiang Province, such as the overall model fit measure after modifying the model are $\chi^2 = 204.311$, $df = 69$, $P\text{-value} = .000$, $\chi^2/df = 2.961$, $CFI = 0.975$, $GFI = 0.914$, $AGFI = 0.909$, $RFI = 0.912$, $NFI = 0.903$, $TLI = 0.921$, $RMSEA = 0.071$, $RMR = 0.069$ that can be interpreted the scores using the standard criteria., which has passed the requirements. Eventually, the before- and after-model fit of this study is shown in Table 4. The interpretation of these indices follows common SEM guidance for assessing comparative fit, absolute fit, and residual-based fit (Byrne, 2016; Kline, 2023; Schumacker & Lomax, 2016).

Table 4 Modified comparison of before- and after-model fit

Fit Index	Criterion	Before Modification	After Modification	Interpretation
χ^2/df	< 3.00	5.65	2.96	Improved to pass
CFI	≥ 0.95	0.78	0.98	Improved to pass
GFI	≥ 0.90	0.70	0.91	Improved to pass
AGFI	≥ 0.90	0.68	0.91	Improved to pass
RFI	≥ 0.90	0.71	0.91	Improved to pass
NFI	≥ 0.90	0.74	0.90	Improved to pass
TLI	≥ 0.90	0.81	0.92	Improved to pass
RMSEA	< 0.08	0.09	0.07	Improved to pass
RMR	< 0.08	0.10	0.07	Improved to pass

6.4 Direct, Indirect, and Total Effects

The total-effect results identify market competitiveness as the strongest factor influencing parent satisfaction, followed by teaching quality, educational service management, and student academic support. The model explained 57.4% of the variance in parent satisfaction, indicating moderate-to-strong explanatory power for an education management model (Anderson & Gerbing, 1988; Kline, 2023).

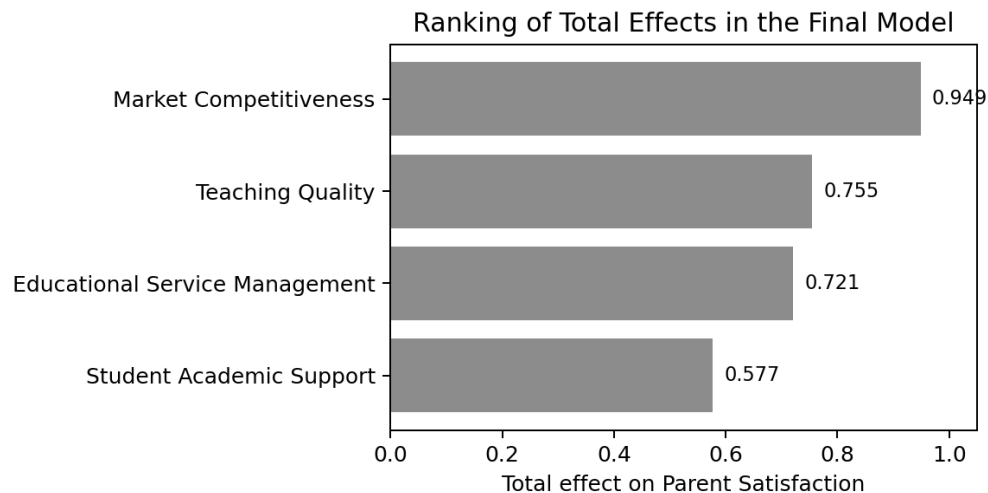
**Figure 4** Modified total-effect ranking of the final SEM model

Table 5 presents the reorganized effects of causal variables on parent satisfaction in the final structural equation model. It summarizes the direct, indirect, and total effects of teaching quality, market competitiveness, academic support, and educational service management. The table is important because it shows how each factor contributes to parent satisfaction both directly and through educational service management. Market competitiveness has the strongest total effect, followed by teaching quality, educational service management, and academic support. Therefore, Table 5 helps explain that the success of G12 educational service management depends on integrated academic, strategic, support, and management factors.

Table 5 Reorganized effects of causal variables on parent satisfaction

Causal Variable	Direct Effect on PS	Indirect Effect via EM	Total Effect on PS	Meaning
Teaching Quality (TQ)	0.463	0.295	0.755	Second strongest overall contributor
Market Competitiveness (MC)	0.560	0.389	0.949	Strongest total effect
Academic Support (AS)	0.264	0.317	0.577	Important through support and mediated influence
Educational Service Management (EM)	0.724	No indirect effect	0.721	Strong direct mechanism

The main total-effects equation derived from the final model is:

$$PS = 0.755TQ + 0.945MC + 0.577AS + 0.721EM \dots\dots\dots \text{Equation 1}$$

Equation 1 explains the total effects of four causal variables on parent satisfaction (PS) in the final SEM model. In this equation, TQ refers to teaching quality, MC refers to market competitiveness, AS refers to student academic support, and EM refers to educational service management. The coefficient values show the relative strength of each factor in influencing parent satisfaction. Market competitiveness (0.945) has the strongest total effect, meaning that institutional positioning, market reputation, program differentiation, and competitive strategy are the most powerful contributors to parent satisfaction. Teaching quality (0.755) is the second strongest factor, showing that effective teaching methods, course design, and educational level strongly shape parents' perceptions. Educational service management (0.721) also has a strong effect because technology usage, integration, and management competency help convert services into parent value. Academic support (0.577) remains important through resources, tutoring, and continuing study programs. Therefore, this equation shows that parent satisfaction depends on the integration of market strength, teaching quality, academic support, and management capability.

The structural bridge equation showing how educational service management is formed is:

$$EM = 0.413TQ + 0.541MC + 0.444AS \dots\dots\dots \text{Equation 2}$$

Equation 2 explains how educational service management (EM) is formed through three upstream factors: teaching quality, market competitiveness, and student academic support. The equation shows that market competitiveness (0.541) has the strongest influence on educational service management. This means that institutions with clear positioning, competitive strategies, and strong service differentiation are more likely to develop effective management systems. Academic support (0.444) is the second important contributor, showing that resource availability, tutoring programs, and continuing study programs help strengthen service organization and institutional readiness. Teaching quality (0.413) also contributes to educational service management because effective teaching methods, educational level, and course design require strong coordination, planning, and management support. This equation is important because it positions educational service management as a bridge mechanism. It explains how teaching, market strategy, and academic support are transformed into organized service delivery. Therefore, improving EM requires institutions to manage academic quality, competitiveness, and support systems together rather than separately.

These two equations summarize how the final SEM model explains parent satisfaction and educational service management in Zhejiang's G12 education service industry. Equation 1 shows that parent satisfaction is influenced by four factors: teaching quality, market competitiveness, academic support, and educational service management.

Among these, market competitiveness has the strongest total effect, followed by teaching quality, educational service management, and academic support. This means parents are most satisfied when institutions have strong competitive positioning, effective teaching, good support services, and capable management. Equation 2 explains that educational service management is shaped by teaching quality, market competitiveness, and academic support. Together, the equations show that institutional success depends on integrated academic quality, market strategy, student support, and technology-enabled management.

6.5 Hypothesis Testing

All seven hypotheses were accepted. This means that teaching quality, market competitiveness, student academic support, and parent satisfaction each contributed positively to the education service management structure and parent satisfaction outcome in the final model. Hypothesis testing in SEM is useful because it connects theoretical assumptions with empirical path coefficients and model fit evidence (Byrne, 2016; Kline, 2023).

Table 6 Hypothesis testing results rewritten for study presentation

Hypothesis	Path Statement	Coefficient	Result
H1	Teaching Quality positively affects Educational Service Management	0.28	Accepted
H2	Market Competitiveness positively affects Educational Service Management	0.57	Accepted
H3	Student Academic Support positively affects Educational Service Management	0.50	Accepted
H4	Parent Satisfaction positively affects Educational Service Management	0.26	Accepted
H5	Teaching Quality positively affects Parent Satisfaction	0.23	Accepted
H6	Market Competitiveness positively affects Parent Satisfaction	0.34	Accepted
H7	Student Academic Support positively affects Parent Satisfaction	0.41	Accepted

All seven hypotheses were accepted, confirming that the proposed structural relationships among the major factors were supported by the empirical results. Teaching quality had a positive effect on educational service management, showing that effective teaching methods, appropriate educational level, and course design contribute to stronger institutional management. Market competitiveness had the strongest effect on educational service management, indicating that market share, institutional positioning, and competitive strategy are important for management success. Student academic support also positively affected educational service management, proving that resources, tutoring programs, and continuing study programs strengthen institutional capability. Parent satisfaction positively affected educational service management, suggesting that academic feedback and activity feedback support

service improvement. In addition, teaching quality, market competitiveness, and student academic support each positively affected parent satisfaction. These findings show that parent satisfaction is shaped by academic quality, competitive service value, and effective support systems. Overall, Table 6 confirms that the success of G12 educational service industry management in Zhejiang Province depends on the integrated influence of teaching, market strategy, academic support, parent satisfaction, and management capability (Blagireva, 2015; Latif et al., 2019; Li et al., 2022; Lindberg, 2023; Sanfo & Malgoubri, 2023).

6.6 Implementation Suitability and Qualitative Findings

The implementation assessment with 30 stakeholders showed that all model components were suitable and possible for application. Teaching quality received 99.6% agreement, market competitiveness 93.3%, academic support 100%, parent satisfaction 96.7%, and educational service management 100%. These results indicate that stakeholders viewed the model as practical and applicable to the education service industry in Zhejiang Province. The strong agreement also reflects the relevance of service quality, stakeholder satisfaction, learning support, and technology-enabled management as emphasized in related literature (Latif et al., 2019; Li et al., 2022; Singh et al., 2023).

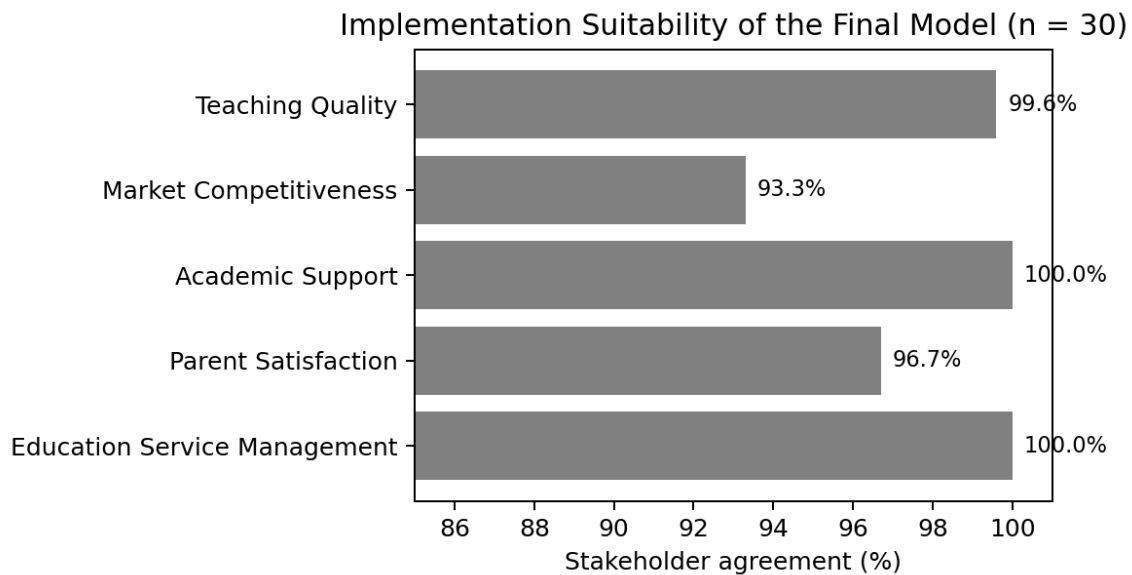


Figure 5 Modified suitability profile of the implemented model

The implementation assessment of the final model based on five major components: teaching quality, market competitiveness, academic support, parent satisfaction, and educational service management, are concluded that stakeholder agreement levels and explains how each component can be applied in G12 educational service institutions in Zhejiang Province. The results show that all components were considered suitable for implementation, with academic support and educational service management receiving full agreement. These results are consistent with studies emphasizing the practical importance of teaching quality, competitive positioning, academic support, parent communication, and digital service management (Blagireva, 2015; Fei et al., 2026; Lindberg, 2023; Singh et al., 2023; Wood, 2023).

Therefore, Table 7 is important because it connects the SEM results with practical application and confirms that the proposed model is feasible for improving institutional management and service quality.

Table 7 Implementation assessment summarized by model component

Model Component	Stakeholder Agreement	Interpretation	Application Focus
Teaching Quality	99.6%	Suitable	Supported by teaching methods, educational level, and course design
Market Competitiveness	93.3%	Suitable	Supported by differentiation, positioning, and strategy
Academic Support	100.0%	Suitable	Supported by resources, tutoring, and continuing study programs
Parent Satisfaction	96.7%	Suitable	Supported by academic and activity feedback
Educational Service Management	100.0%	Suitable	Supported by technology usage, integration, and management competency

The qualitative interviews supported the quantitative findings. Students emphasized personalized learning plans, experienced teachers, peer collaboration, online platforms, AI-driven practice tools, digital libraries, and internships or real-world projects. Parents emphasized communication, regular updates, progress tracking, soft skills training, career counseling, gamified learning applications, and alumni networks. Administrators highlighted teacher recruitment, professional development, decentralized management, data analytics, infrastructure, smart tools, and curriculum alignment with global standards. Instructors emphasized teacher-student rapport, real-world examples, interactive tools, test preparation resources, language learning applications, hands-on learning, and virtual labs. Across the interviews, technology, personalized learning, teacher expertise, transparent management, and integrated support appeared repeatedly as success conditions. These qualitative themes are consistent with prior work on technology-supported education, teaching quality, parental communication, and organizational uncertainty in educational change (Lindberg, 2023; Ruiz-Esteban & Santos del Cerro, 2020; Singh et al., 2023; Yurkofsky, 2022).

7. Research Discussion

The findings show that market competitiveness is the strongest total driver of parent satisfaction. This result is meaningful because the education service industry is not only a pedagogical system but also a competitive service market. Institutions that can differentiate themselves, communicate value, and align their programs with stakeholder expectations are more likely to gain parent trust and sustain demand. In Zhejiang's competitive G12 environment, market competitiveness operates as a strategic lever that connects service reputation with institutional success. This finding is consistent with Blagireva (2015), who emphasized the competitiveness of educational organizations, and Ma and Wright (2023), who showed how educational consulting and school choice are connected with family strategies and market differentiation.

Teaching quality remains a major contributor. Although market competitiveness had the largest total effect, teaching quality provides the academic foundation of service value. Technical teaching methods, educational level, and course design help students engage with content and prepare for future study. The results suggest that institutions should not treat marketing and teaching as separate domains. Competitive positioning must be supported by real instructional quality. This interpretation agrees with Sanfo and Malgoubri (2023), who emphasized the role of teaching quality in student achievement, Latif et al. (2019), who identified teacher quality as a core dimension of educational

service quality, and Ruiz-Esteban and Santos del Cerro (2020), Thommen et al. (2021), Youthao et al. (2026) and Hartl and Holzberger (2022), who discussed teaching quality and teacher-related professional conditions.

Student academic support also plays an important role, especially through indirect pathways. Resource availability, tutoring programs, and continuing study programs help students respond to academic pressure and prepare for university entrance. The results indicate that academic support is not merely a supplementary service; it is a structural part of educational service management. Strong support systems can strengthen both parent satisfaction and institutional capability. This finding is related to Si (2021), who emphasized academic guidance and support, Guo et al. (2019), who discussed education quality and equity, and Wood (2023) and Zhou et al. (2023), who highlighted educational gaps, curriculum support, and broader learning opportunities.

Educational service management is a key mechanism in the model. Technology usage, integration, and management competency allow institutions to transform teaching quality, market competitiveness, and academic support into parent satisfaction. This explains why the model includes EM as both a direct driver and a mediating mechanism. The findings therefore support a management-oriented view of educational service success, where institutional capability is required to convert resources and strategies into stakeholder value. This view is consistent with SEM-based management logic and with research emphasizing technology-supported learning and organizational capability in educational change (Anderson & Gerbing, 1988; Brown, 2015; Kline, 2023; Singh et al., 2023; Yurkofsky, 2022).

The qualitative findings deepen the SEM results by showing how these factors operate in practice. Stakeholders repeatedly mentioned personalized learning, data analytics, communication, AI tools, digital platforms, hands-on learning, and management transparency. These themes show that future educational service institutions must combine human-centered teaching with technology-enabled service management. This qualitative interpretation is consistent with studies emphasizing trust and communication in satisfaction, digital transformation in teaching and learning, and the importance of learning environments in educational service evaluation (Li et al., 2022; Lindberg, 2023; Channuwong & Kantatian, 2012; Singh et al., 2023).

8. New Knowledge

The new knowledge from this study is the Zhejiang G12 Education Service Management Success Model. The model explains that parent satisfaction, as the key success outcome, is shaped by four main levers: market competitiveness, teaching quality, academic support, and educational service management. Market competitiveness is the strongest strategic driver, while educational service management functions as the mechanism that transforms teaching, market, and academic-support improvements into stakeholder satisfaction. The model is supported by the dissertation's theoretical matrix, which connected these constructs and observed indicators to prior research on teaching quality, competitiveness, parent satisfaction, academic support, and educational service management (Blagireva, 2015; Latif et al., 2019; Li et al., 2022; Sanfo & Malgoubri, 2023; Singh et al., 2023).

The final knowledge can be summarized as an integrated management equation: $PS = 0.755TQ + 0.945MC + 0.577AS + 0.721EM$. This equation offers a practical forecasting and planning tool for educational service institutions. It shows that institutions can improve success by combining stronger competitive positioning with high-quality teaching, student support, and technology-enabled management. Therefore, the model contributes both theoretical knowledge for SEM-based education management research and practical knowledge for G12 educational service providers in Zhejiang Province. This contribution is consistent with the role of SEM in linking theoretical constructs, empirical evidence, and practical decision-making (Anderson & Gerbing, 1988; Byrne, 2016; Kline, 2023).

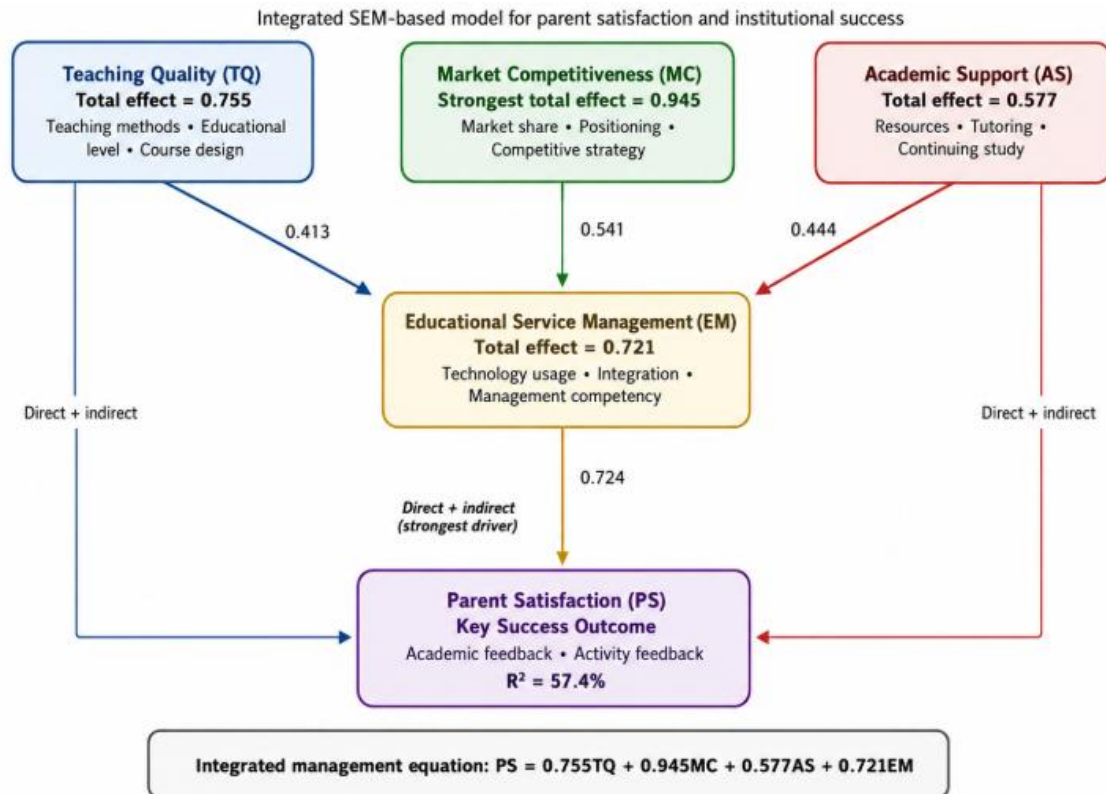


Figure 6 New knowledge of the study: Zhejiang G12 Education Service Management Success Model

The new knowledge diagram presents the Zhejiang G12 Education Service Management Success Model, which explains how parent satisfaction is produced through the integrated effects of teaching quality, market competitiveness, academic support, and educational service management. Market competitiveness is shown as the strongest total driver of parent satisfaction, followed by teaching quality, educational service management, and academic support. Educational service management also functions as a key mechanism because technology usage, integration, and management competency help transform teaching quality, competitive strategy, and academic support into stakeholder value. Parent satisfaction is positioned as the key success outcome because it reflects academic feedback, activity feedback, service value, and institutional credibility (Blagireva, 2015; Latif et al., 2019; Lindberg, 2023; Singh et al., 2023). Therefore, the model shows that success in Zhejiang's G12 education service industry depends on the combination of competitive positioning, instructional quality, student support, and technology-enabled management.

9. Conclusion

The study examined factors influencing the success of education service industry management in Zhejiang Province. The research clarified five major constructs: teaching quality, market competitiveness, academic support, educational service management, and parent satisfaction. SEM analysis confirmed that the modified model fit the empirical data and explained 57.4% of the variance in parent satisfaction. Market competitiveness had the strongest total effect, followed by teaching quality, educational service management, and academic support. All seven hypotheses were accepted, and the implementation assessment confirmed that all model components were suitable for application. The findings demonstrate that the success of G12 educational service institutions in Zhejiang Province depends on an integrated model combining competitive strategy, instructional quality, academic support, technology-enabled management, and parent-centered service response. This conclusion aligns with previous research on educational competitiveness, service quality, teaching effectiveness, digital learning, and parent satisfaction (Blagireva, 2015; Latif et al., 2019; Lindberg, 2023; Singh et al., 2023).

10. Recommendations

1. Strengthen market competitiveness: G12 educational service institutions should develop clear institutional positioning, differentiated programs, and competitive strategies that match parent and student expectations.
2. Improve teaching quality: Institutions should provide regular professional development for instructors, promote interactive teaching methods, improve course design, and integrate technology into classroom delivery.
3. Expand academic support: Educational service institutions should strengthen tutoring systems, digital learning resources, continuing study programs, career planning services, and student performance-tracking systems.
4. Enhance parent satisfaction: Institutions should improve academic feedback, transparent progress reporting, activity feedback, and two-way communication channels between parents, instructors, and administrators.
5. Develop educational service management: Institutions should integrate technology platforms, data analytics, service coordination, and management competency to improve efficiency, credibility, and service quality.
6. Apply the model in wider contexts: Future research should test the model in other provinces, conduct longitudinal analysis, and examine additional variables such as leadership quality, institutional culture, community engagement, and equitable access.

REFERENCES

1. Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, 103(3), 411–423.
2. <https://doi.org/10.1037/0033-2909.103.3.411>
3. Blagireva, E. (2015). On competitiveness of educational organizations. In *Proceedings of the 1st International Conference on Arts, Design and Contemporary Education (ICADCE 2015)* (pp. 905–909). Atlantis Press. <https://doi.org/10.2991/icadce-15.2015.219>
4. Brown, T. A. (2015). *Confirmatory factor analysis for applied research* (2nd ed.). Guilford Press.
5. Byrne, B. M. (2016). *Structural equation modeling with AMOS: Basic concepts, applications, and programming* (3rd ed.). Routledge.
6. Channuwong, S., Phoengurn, T., Rattananda, N., Bangbon, P., & Jia, Y. (2026). Causal relationships among artificial intelligence capability, organizational innovation climate, digital infrastructure readiness and educational quality of Thai Private Universities. *Journal of Intelligent Decision Making and Information Science*, 3(4s), 951-974. <https://doi.org/10.59543/jidmis.v3.1139>
7. Channuwong, S., & Kantatian, W. (2012). The causes of stress and strategies for managing stress: A case study of Thai university staff and lecturers. *European Journal of Scientific Research*, 79(4), 592-606.
8. Fei, Z., Channuwong, S., Bangbon, P., Siripap, P., & Jia, Y. (2026). Socioeconomic and adaptive determinants of sustainable agricultural development (SDG 2) in Thailand. *Natural and Engineering Sciences*, 11(2), 140-152. <https://doi.org/10.28978/nesciences.262012>
9. Guo, L., Huang, J., & Zhang, Y. (2019). Education development in China: Education return, quality, and equity. *Sustainability*, 11(13), 3750. <https://doi.org/10.3390/su11133750>
10. Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis: A global perspective* (7th ed.). Pearson.
11. Hartl, A., & Holzberger, D. (2022). Identifying teachers' motivational profiles and their changes from teacher education into practice: A longitudinal study. *Zeitschrift für Erziehungswissenschaft*, 25, 427–451. <https://doi.org/10.1007/s11618-022-01093-0>
12. Hoyle, R. H. (Ed.). (2012). *Handbook of structural equation modeling*. Guilford Press.
13. Kline, R. B. (2023). *Principles and practice of structural equation modeling* (5th ed.). Guilford Press.
14. Latif, K. F., Latif, I., Sahibzada, U. F., & Ullah, M. (2019). In search of quality: Measuring higher education service quality (HiEduQual). *Total Quality Management & Business Excellence*, 30(7–8), 768–791. <https://doi.org/10.1080/14783363.2017.1338133>
15. Li, B., Duangekanong, S., & Vongurai, R. (2022). Factors affecting satisfaction and trust of art students in senior high schools in Chengdu. *AU-GSB e-Journal*, 15(1), 125–136. <https://doi.org/10.14456/augsbejr.2022.66>
16. Lindberg, E. N. (2023). Parental educational satisfaction and academic success in adolescents. *Educational Research Quarterly*, 46(3), 37–68.

29. Ma, Y., & Wright, E. (2023). Outsourced concerted cultivation: International schooling and educational consulting in China. *International Studies in Sociology of Education*, 32(3), 799–821. <https://doi.org/10.1080/09620214.2021.1927143>
30. Ruiz-Esteban, C. M., & Santos del Cerro, J. (2020). Teaching quality: The satisfaction of university students with their professors. *Anales de Psicología / Annals of Psychology*, 36(2), 304–312. <https://doi.org/10.6018/analesps.335431>
31. Sanfo, J. B. M. B., & Malgoubri, I. (2023). Teaching quality and student learning achievements in Ethiopian primary education: How effective is instructional quality in closing socioeconomic learning achievement inequalities? *International Journal of Educational Development*, 99, 102759. <https://doi.org/10.1016/j.ijedudev.2023.102759>
32. Schumacker, R. E., & Lomax, R. G. (2016). *A beginner's guide to structural equation modeling* (4th ed.). Routledge.
33. Si, R. (2021). Unexpected pressure? The effect of a curriculum reform on household educational investments and student outcomes. *Journal of Economic Behavior & Organization*, 190, 730–746. <https://doi.org/10.1016/j.jebo.2021.08.012>
34. Singh, B., Gupta, V. K., Jain, A. K., Vashishth, T. K., & Sharma, S. (2023). Transforming education in the digital age: A comprehensive study on the effectiveness of online learning. *International Journal of Scientific Research in Engineering and Management*, 7(7), 1–11. <https://doi.org/10.55041/IJSREM24405>
35. Thommen, D., Sieber, V., Grob, U., & Praetorius, A.-K. (2021). Teachers' motivational profiles and their longitudinal associations with teaching quality. *Learning and Instruction*, 76, 101514. <https://doi.org/10.1016/j.learninstruc.2021.101514>
36. Wood, R. M. (2023). A review on education differences in urban and rural areas. *Educational Research*, 14(2), 1–3. <https://doi.org/10.14303/2141-5161.2023.254>
37. Yamane, T. (1967). *Statistics: An introductory analysis* (2nd ed.). Harper & Row.
38. Youthao, S., Channuwong, S., Weerachareonchai, P., Dhammahansakul, N., Sun, R., &
39. Jia, Y. (2026). An AI-Driven framework for smart micro-housing and sustainable urban development (SDG 11). *Natural and Engineering Sciences*, 11(2), 242-252. <https://doi.org/10.28978/nesciences.262022>
40. Yurkofsky, M. (2022). Environmental, technical, and representational uncertainty: A framework for making sense of the hidden complexity of educational change. *Educational Researcher*, 51(6), 399–410. <https://doi.org/10.3102/0013189X221078590>
41. Zhou, X., Zhang, F., Shan, L., & Lin, C. (2023). Research on the current situation and problems of ecological civilization education for contemporary college students: An empirical analysis based on structural equation modeling. *Sustainability*, 15(22), 16051. <https://doi.org/10.3390/su152216051>