



**QUALITATIVE COMPARATIVE ANALYSIS (QCA) IN EDUCATION MANAGEMENT RESEARCH**

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Article info	ABSTRACT
<p><b>Corresponding Author:</b></p> <p>Tubagus Syihabudin  <a href="mailto:tubagus.syihabudin@uinbanten.ac.id">tubagus.syihabudin@uinbanten.ac.id</a>                      State Islamic University of Sultan Maulana Hasanuddin Banten</p>	<p>The research aims to analyse the potential application of <i>the Qualitative Comparative Analysis</i> (QCA) method in uncovering the configuration of managerial factors that contribute to the effectiveness of education management, and to evaluate the relevance of QCA as a set-theoretical approach in strategic decision-making of the Internal Quality Assurance System (SPMI) in higher education. This research employs a qualitative approach, drawing on systematic literature reviews and case studies from educational management, particularly those examining university governance and institutional performance. The results show that (QCA) has a strong potential to uncover the configuration of managerial factors that contribute to the effectiveness of education management and the (SPMI) in higher education, not through a single variable but through a combination of conditions such as the strength of SPMI implementation, the application of Good University Governance (GUG) principles, Leadership support, and a consistent quality evaluation system. This research contributes by offering a conceptual framework for applying QCA in educational management and by providing research recommendations.</p>
	<p><b>Keywords:</b> <i>Implementation, QCA, Research, SPMI, Education</i></p>
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**INTRODUCTION**

Educational management is generally understood as the process of managing educational resources through the functions of planning, organising, implementing, and supervising to achieve expected educational goals effectively and efficiently. Within this framework, the management of academic institutions is concerned not only with administrative aspects but also with strategic decision-making oriented towards the quality of learning and graduate performance (Bush, 2007; Baumann et al., 2016; Marin & Marin-Pantelescu, 2020).

In practice, the effectiveness of education management is primarily determined by the configuration of various factors, including the principal's Leadership style, planning model, financing management, quality governance, and technology utilisation (Akkaya, 2021; Dacholfany et al., 2024). This phenomenon shows that the relationship between managerial factors and institutional performance is complex and not always linear (Hicklin et al., 2008; Bush, 2020). For this reason, an analytical approach is needed that accounts for multiple conditions rather than the influence of a single variable.

Qualitative Comparative Analysis (QCA) is a set-theoretical configuration method that uses set logic and Boolean algebra to test combinations of causal conditions on a result (Ragin, 1987; Marx et al., 2014; Legewie, 2019). In educational management, QCA can be used to identify combinations of Leadership practices, planning patterns, funding systems, and quality evaluation mechanisms associated with high school or college performance (Cilesiz & Greckhamer, 2020; Cardona, 2024; Wang et al., 2024). Thus, QCA has the potential to serve as a strategic analytical tool for policymakers and education managers to examine patterns of success and failure in institutional management in greater depth (Luo & Wen, 2024; Ghafar, 2024; Cooper & Glaesser, 2015).

The goal is to identify different "paths" or configurations of factors that can produce the same results (*equifinality*), making it suitable for explaining the causality of cross-case complexes (Rihoux, 2009). Its main principles include a case-based orientation, conjunctive causality modelling (factors working in combination), recognition of equifinality and asymmetry, and the use of set membership (binary or fuzzy) to assess condition–outcome relationships (Mello, 2022).

A major problem in educational management research is the limitations of analytical methods for capturing complex, multi-factor configurations. Many studies still rely on descriptive analysis or linear regression that positions the relationships between variables additively and independently, making it challenging to uncover the pattern of "combination of conditions" that gives rise to high or low institutional performance (Cohen et al., 2007; Ndidi et al., 2025; Hamid, 2025). In practice, educational management success often stems from a combination of factors, including strong Leadership supported by strategic planning, adequate financing, and a consistent quality evaluation system, particularly in secondary and higher education.

In addition, much education management research in Indonesia focuses on the influence of one or two specific variables, namely Leadership style or academic supervision, without examining how these variables interact in different configurations in different institutional contexts (Faujiah et al., 2023; Wahyuni, 2018; Fathih & Muhlis, 2023; Ismah, 2020; Sudiarti et al., 2020). This condition makes it challenging to prepare contextual policy recommendations because there is no map of managerial factor configurations that can serve as a reference for specific types of schools or colleges.

The higher education sector in Indonesia comprises universities, institutes, high schools, polytechnics, and academies, which are either public or private. However, in terms of the number of institutions and students, private universities (PTS) dominate, even though this large proportion is accompanied by considerable variation in quality and managerial

capacity (Sayidah et al., 2019; Majid, 2023; Piliyanti & Awirya, 2022). Public universities generally have greater funding, higher levels of selectivity, and a public accountability mandate. In contrast, private universities are required to be more managerially adaptive and innovative in competitive strategies, accreditation, and educational services to meet the demands of the job market and societal expectations (Esha, 2020; Putri & Lutfianawati, 2023; Suyadi et al., 2022).

At the global level, QCA has been widely discussed as a relevant method for researching complex causal relationships in the fields of social sciences and management, including in the study of university governance and institutional performance (Wang et al., 2024; Cilesiz & Greckhamer, 2020; Legewie, 2022; Xu et al., 2024). However, studies that explicitly link QCA to educational management, especially in Indonesia, remain very limited and typically stop at descriptive qualitative analyses or comparative studies without a set-theoretical logic. In many Indonesian education management journals, research focuses primarily on the implementation of management functions (planning, organising, implementing, and supervising), without exploring new methodological approaches such as QCA.

Another gap is the lack of conceptual and practical guidance on adapting QCA to educational management issues, such as school quality development, college governance, and the implementation of integrated quality management. Some educational researchers are not familiar with the main stages of QCA, such as data calibration into sets, preparation of the Truth Table, analysis of necessary and sufficient conditions, and interpretation of the configuration of the results (Asyafah, 2014; Madhakomala et al., 2022; Isomudin et al., 2021; Gunawan et al., 2023). This gap provides an opportunity for this conceptual research to explain the role of QCA in educational management.

Several studies on educational management at the primary and secondary school levels employ qualitative-descriptive comparative analysis to compare management practices across countries or institutions. For example, a study comparing the management of basic education in Indonesia and Malaysia shows differences in planning, organising, implementation, and control, but the analysis does not yet use the QCA set-theory framework (Ramadhani, 2019; Haryanto, 2015; Marmoah et al., 2023; Verweij & Noy, 2013). Other studies analysed the influence of socioeconomic factors on educational management through qualitative literature reviews and comparative analyses, yet still relied on conventional narrative synthesis (Silalahi et al., 2023; Ichsan & Susanti, 2025; Saputra & Fauzi, 2022; Idris & Yusuf, 2020).

The international literature, QCA is increasingly applied in educational research to analyse learning engagement, teacher professional development, and configurations of university policy and governance. Studies on university governance and performance use QCA to identify combinations of quality, Leadership, planning, and financing policies that correlate with high performance (Kultsum et al., 2022; Berg-Schlosser et al., 2008; Ghafar, 2024; Cragun et al., 2016). These studies show that QCA can uncover equifinality, namely, multiple combinations of conditions that produce the same managerial outcomes.

Previous research has shown that QCA in education is primarily used in pedagogic and professional development contexts. In contrast, its use to map the configuration of education management functions (planning, organising, Leadership, financing, quality control) and associate it with outcomes such as accreditation, graduate performance, or stakeholder satisfaction is still minimal, especially in Indonesia, which tends to use descriptive qualitative design or surveys and has almost no QCA methodological articles in Indonesian.

This study aims to analyze the potential application of QCA in uncovering the configuration of managerial factors that contribute to the effectiveness of education management as well as evaluate its relevance as a set-theoretical approach to strategic decision-making in educational institutions, with theoretical contributions integrating the concept of education management and the QCA framework so that the research approach shifts from linear-variable analysis to configuration analysis, and practical contributions in the form of A guide for schools and colleges to identify "recipes" for effective combination of policies, governance, and management practices as the basis for more sophisticated strategic planning, quality development, and policy evaluation based on managerial data.

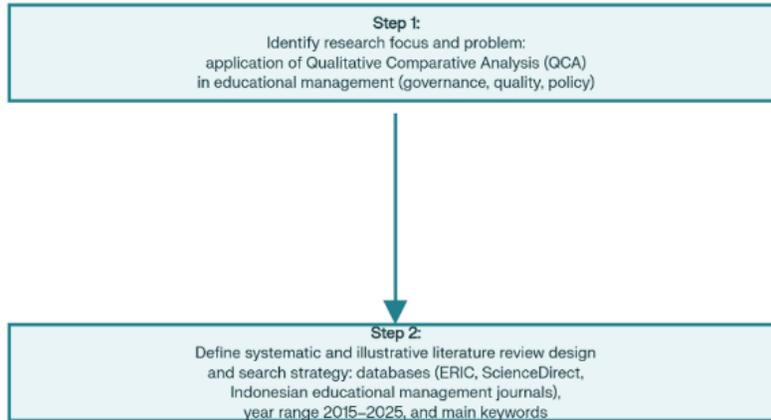
## **METHOD**

This study employs a qualitative approach with a systematic, illustrative literature review design. According to Luce-Kapler (2008), Qualitative literature studies emphasise critical, interpretive, and reflective reading of the text, rather than simply summarising the content of previous studies descriptively. Content analysis is a technique for systematically analysing written, visual, or symbolic data by grouping content into categories, enabling inferences that can be replicated (Mayring, 2015). As for the research stage, the first step is to collect relevant articles related to QCA in education, education management, and general management from the database Google Scholar, DOAJ (Open Access), ScienceDirect (Elsevier), Scopus, Web of Science(extensive index), PubMed (biomedical), JSTOR, SINTA and ResearchGate with the range of 2015–2025. The selection was made based on the keywords "Qualitative Comparative Analysis", "education management", "university governance", and "quality management in education".

The second step is to conduct a content analysis of the selected articles to identify: (1) how QCA is used in the context of governance, quality, and education policy; and (2) its potential adaptation to the context of Indonesian education management. In addition, the study presented a hypothetical design for applying fsQCA to analyse the configuration of management factors that produce high school performance, based on quality and management indicators commonly used in the literature. The focus of the research is not on collecting field data, but on formulating a conceptual framework and a QCA design that can be adopted in subsequent empirical studies.

From the explanation above, to make it easier to understand the analysis steps, as shown in the following figure:

**Chart 1. Stages of Data Analysis Techniques**



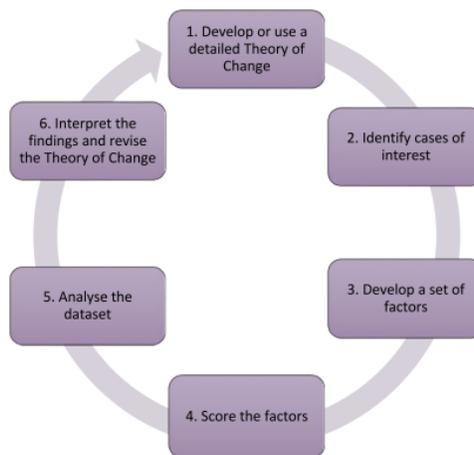
## RESULT AND DISCUSSION

### RESULT

#### *Identification of QCAs in Education Management Research*

Based on the qualitative comparative model presented by Vanfraechem and Aertsen (2017), it is used in answering the research objectives because it is used as a conceptual framework and QCA design that can be adopted in education management research, as shown in the following figure:

**Chart 2: Steps for the Implementation of Qualitative Comparative Analysis (QCA) Based on the Theory of Change**



**Source:** (Vanfraechem & Aertsen, 2017)

The figure depicts the QCA implementation cycle, based on the Theory of Change, comprising six mutually sustainable stages. *First*, the researcher develops or uses a detailed Theory of Change as the initial framework of the cause-and-effect relationship to be tested.

*Second*, the researcher identifies the relevant cases (e.g., schools or programs) for analysis. *Third*, the researcher compiled a set of factors and conditions suspected of influencing the outcome. Fourth, each factor is assigned a score or membership value (usually binary or fuzzy) for each case. Fifth, all encoded data are analysed (e.g., using truth tables and Boolean simplification) to identify the condition configuration associated with the outcome. *Sixth*, the researcher interprets the findings and revises the Theory of Change to sharpen the theory and prepare it for testing or reuse in the following evaluation cycle.

The review results indicate that QCA has been used effectively to analyse the relationships among quality policy, Leadership, planning, financing, and university performance. The studies found that no single factor is sufficient to explain the performance of higher education institutions; rather, the configuration of several educational management factors, combined with consistent quality policies and long-term strategic planning, is necessary.

The following Table summarises a brief comparison of QCA and traditional analytical approaches in education management research:

**Table 1. Identification of QCAs in Education Management Research**

Aspects	Traditional Analysis (Regression/Descriptive)	QCA in Educational Management
Relationship focused	Linear, additive between variables	Condition configuration (set)
Causality properties	One-way, average effect	Multi-path, <i>equifinality</i>
Suitable for	Relatively few independent variables	Complex Managerial Factors
Main results	Coefficient of influence	Necessary and sufficient condition configuration

The Table explains that, in educational management research, traditional analyses such as regression and descriptive statistics focus on linear and additive relationships between variables and produce coefficients of influence that describe the average effects of a single causal path, and are more suitable when the number of independent variables is relatively small. Instead, QCA focuses on the configuration of conditions as a set, modelling causality as a multi-path process with *equifinality*.

### ***Implementation of QCA in the Internal Quality Assurance System in Higher Education***

The most important and urgent implementation in Indonesian universities is the strengthening of the internal quality assurance system (SPMI) and good university governance (Good University Governance), because the quality of higher education is highly determined by how universities manage the quality assurance cycle (planning, implementation, evaluation, and continuous improvement) and apply the principles of transparency, accountability, effectiveness, efficiency, and participation in taking decision.

For this reason, the application of QCA to SPMI in higher education is very crucial to be proposed as a strengthening of the concept of higher education with education management research, as follows:

**Table 2. Stages of QCA in SPMI in Higher Education**

QCA Stage	Implementation of SPMI in Higher Education
Formulating questions and outcomes	Establish the question: what combination of SPMI and Good University Governance (GUG) practices contributes to higher education performance (e.g. superior accreditation, good tridharma performance).
Define and select cases.	Selecting several state universities and private universities with variations in accreditation status, size, and level of implementation of SPMI, each university becomes one QCA case.
Establish managerial conditions/factors.	Determine conditions such as: the strength of SPMI implementation, the application of GUG principles, the effectiveness of quality assurance units, and Leadership support for quality culture.
Collect data and create a matrix.	Taking data from SPMI documents, accreditation reports, governance guidelines, and performance data, compile a case-condition-outcome matrix.
Calibrate data into sets	Converts raw data into a set membership score (0/1 for csQCA or 0–1 fuzzy for fsQCA) with thresholds based on BAN-PT/SPMI criteria.
Compile and analyse truth tables.	Compile a truth Table containing all combinations of conditions and outcomes; Set consistency and frequency thresholds to select relevant combinations.
Analysis of necessary and sufficient conditions	Testing the necessary and/or sufficient conditions for high performance, then performing Boolean minimisation to obtain a configuration of managerial factors that lead to high performance.
Interpretation of configurations and theories	Interpret the configuration (e.g. strong SPMI + high GUG + high-performance Leadership → support) and relate it to the theory of quality assurance and governance of higher education in Indonesia.
Policy implications and further research	Formulate recommendations to strengthen SPMI-GUG for PTN/PTS and propose follow-up studies (e.g., QCA and in-depth case studies) to elucidate causal mechanisms.

**DISCUSSION**

***QCAs in Education Management Research***

*Qualitative Comparative Analysis* (QCA) is a set-theoretic configuration method for analysing how combinations of causal conditions relate to a single outcome, using subset logic, Boolean algebra, and the concepts of necessary and sufficient conditions (Legewie, 2019). The goal is to identify different "paths" or configurations of factors that can produce the same results (*equifinality*), making it suitable for explaining the causality of cross-case

complexes (Rihoux, 2009). Its main principles include a case-based orientation, conjunctive causality modelling (factors acting in combination), recognition of equifinality and asymmetry, and the use of set membership (binary or fuzzy) to assess condition–outcome relationships (Mello, 2022).

A based approach, Theory of Change. In line with the guidelines of the International Quality Assurance Agency, which emphasise that the quality cycle must begin with a clear theory of institutional change, the selection of relevant performance indicators, and a systematic analysis of evidence before policies are improved. Furthermore, Check then Schutt (2017), Seny Kan et al. (2016) and Parente and Federo (2019) emphasise that the higher education quality assurance literature shows that effective SPMI requires the development of key quality factors, the collection and processing of performance data, and cyclic feedback to improve policies and practices. The step-by-step model depicted in the figure is also consistent with the university quality and governance framework, which emphasises the importance of a data-driven planning–implementation–evaluation–improvement (PPEPP) cycle as the core of an internal quality culture (Mohammady, 2018; Handayani & Muliastri, 2021).

It is argued that various combinations of complex managerial factors can produce the same outcome, and that the primary output is a configuration of conditions that are necessary and/or sufficient for a result in educational management (Thiem, 2014; Mello, 2023). These findings align with Luo and Wen (2024) and Khan et al. (2024), who show that QCA can identify necessary and sufficient conditions for the performance of higher education institutions while accommodating the phenomenon of *equifinality* in education management.

In comparative studies, education management research emphasises the importance of integrated planning, implementation, and quality control functions, although QCA has not been used (Cardona, 2024; Ikhwan & Yuniana, 2022). If the QCA framework is implemented, these functions can be calibrated by generating the following set of conditions: "high strategic planning", "strong participatory Leadership", "systematic quality evaluation system", and "utilisation of management technology". The QCA can then be used to identify which combinations occur most frequently in schools with high accreditation or strong student performance, yielding a "success configuration" in educational management.

### ***QCA in the Internal Quality Assurance System in Higher Education***

The Internal Quality Assurance System (SPMI) in Indonesian universities is conceptually defined as a series of systemic quality assurance activities that are planned, implemented, evaluated, controlled, and developed by the universities themselves autonomously to ensure the fulfilment and improvement of the National Standards for Higher Education in a sustainable manner (Fadhli, 2020).

National regulations under the Higher Education Law and Permendikbudristek 53/2023 affirm that SPMI is the primary foundation for quality assurance. In contrast, external accreditation (SPME) only verifies the achievement of standards established

through SPMI, within a quality cycle known as PPEPP (Determination, Implementation, Evaluation, Control, and Improvement). Thus, SPMI is not merely a demand for administrative compliance but a strategic instrument for building a culture of quality at the university, faculty, and study program levels (Raharjo et al., 2019).

The implementation of SPMI in Indonesian universities has developed through the establishment of quality assurance units at various levels, the preparation of quality documents (policies, manuals, standards, forms), the implementation of the PPEPP cycle, and internal quality audits as a control mechanism (Istikomah et al., 2021).

Higher education quality management also emphasises that effective SPMI must be understood as part of a quality culture development strategy rather than merely as a technical instrument for accreditation (Hadi, 2020). The development of this quality culture is reflected in the consistency of PPEPP implementation, the integration of SPMI with strategic planning and performance information systems, as well as alignment with national standards and international good practices such as the European Higher Education Area (EHEA) framework in terms of transparency, accountability, and continuous improvement (Anwar Abidin, 2017).

The application of QCA in the case of internal quality assurance (SPMI) and university governance in Indonesia is important because various studies show that the effectiveness of the quality assurance system and institutional performance is primarily determined by a combination of top management support, quality Leadership, academic participation, and infrastructure quality, not by a single factor (Fadhli, 2020; Supriyanto, 2012; Nur et al., 2020). In this context, the QCA stages—starting from formulating university performance outcomes, selecting cases of PTN and PTS with variations in SPMI implementation, defining conditions such as the strength of SPMI, the implementation of Good University Governance, the effectiveness of quality assurance units, to Leadership support—allows researchers to calibrate data into sets, compile truth tables, and identify the configuration of conditions that are necessary and/or sufficient for high performance.

Various cutting-edge studies such as Lubis and Pratama (2021) and Sahrin et al., (2022) shows that many universities in Indonesia are still weak in the implementation of internal quality assurance and alignment of quality policies with daily practices (for example, only active during accreditation), so that strengthening SPMI management and the principles of Good University Governance is the key to improving quality culture, accreditation, academic productivity, and the competitiveness of graduates at the national and global levels.

Through such configuration analysis, QCA can uncover several different "recipes" of success, for example, a combination of an established SPMI with strong Leadership support and a transparent governance structure, or an alternative scenario where highly active Leadership can compensate for specific weaknesses in the quality infrastructure. This approach is in line with the view that Hadi (2020) and Mulyasa and Aryani (2022) hold that quality assurance and governance in higher education is a complex architecture that involves the role of the state, internal governance framework, quality culture, and institutional Leadership, so that the causality is multi-pathway and contextual. Thus, the

implementation of QCA enriches the quality assurance research methodology and the conceptual culture of quality, and provides a stronger empirical basis for university leaders in Indonesia to design quality improvement and governance strategies that align with the strengths and weaknesses of each institution

## CONCLUSION

Qualitative Comparative Analysis is a relevant and promising theoretical approach to SPMI strategic decision-making because it can identify necessary and/or sufficient conditions for institutional performance, accommodate multi-path causality, and provide a "recipe" for an effective combination of SPMI-GUG practices tailored to each university's characteristics. In the context of policy, the implication is that the leaders of PTN and PTS need to start integrating QCA design into SPMI evaluations, for example by building a database of university cases, calibrating quality indicators (SPMI, GUG, Leadership, civic participation, infrastructure) into a fuzzy set, and using the configuration results as the basis for managerial intervention priorities, rather than simply pursuing accreditation compliance. The subsequent research is suggested to move to the empirical study of fsQCA with a sample of universities in various regions of Indonesia to test this conceptual model quantitatively-configuratively, combine it with an in-depth case study (*multimethod QCA*) to understand the causal mechanism behind each success configuration, and expand the application of QCA to other issues such as the governance of study programs, the implementation of the Independent Curriculum in higher education, and the relationship between quality culture, *tridharma* performance, and the competitiveness of graduates.

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