
Research Articles

Artificial Intelligence (AI) Analytics to Enhance EdPEX Self-Assessment Quality and Data-Driven Strategic Decision Making

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Abstract

The research on the Study of the quality of self-assessment according to the criteria for developing educational quality towards excellence (EdPEX) has the objectives 1) to study the factors related to the quality assurance operation and the self-assessment process according to the criteria for developing educational quality towards excellence (EdPEX) 2) to find the formats, concepts, and main issues that affect the self-assessment according to the criteria for developing educational quality towards excellence (EdPEX) using a mixed research methodology. The research collected data from the sample group, including administrators, lecturers, and staff of Suan Sunandha Rajabhat University.

The quantitative findings revealed that the overall level of quality assurance system implementation and self-assessment was "high" (mean 4.02, SD = 0.48). The highest-scoring categories were organizational leadership and strategic planning, while the lowest-scoring categories were measurement, analysis, and knowledge management and implementation. A Pearson correlation analysis revealed a significant positive relationship between administrator commitment and staff engagement and the level of quality assurance system implementation ($r = 0.68$, $p < 0.01$). Multiple regression analysis indicated that administrator commitment and

internal communication were key factors positively influencing quality assurance system implementation ($p < 0.05$) and accounted for 55% of the variance. The qualitative findings from in-depth interviews indicated that Respondents have a basic understanding of EdPEx principles but lack a systematic understanding. Organizational leadership and governance play a crucial role in driving educational quality. Strategic planning is clear but lacks the use of evidence-based data to support decision-making. Regarding customer focus and knowledge management, there are still developments to include a central tracking system and database. Meanwhile, personnel have positive attitudes toward quality assurance but require further knowledge development.

Keywords: Education, Excellence, Self-Assessment, Artificial Intelligence

Introduction

Educational quality assurance has become a fundamental mechanism for enhancing the standards and performance of higher education institutions. It plays a critical role in ensuring institutional strength, transparency, accountability, and responsiveness to the expectations of students, stakeholders, and society. In contemporary higher education systems, universities increasingly prioritize internal quality assurance processes, particularly through the Self-Assessment Report (SAR), which serves as a reflective tool for evaluating institutional performance, identifying strengths, and addressing areas requiring improvement. The outcomes of SAR are widely used as evidence-based inputs for continuous quality improvement and strategic development. One of the key frameworks used to evaluate and enhance the quality of educational management is the Education Criteria for Performance Excellence (EdPEx). This framework provides a systematic and comprehensive approach to organizational excellence, encompassing seven core categories: leadership, strategic planning, customer focus, measurement, analysis and knowledge management, workforce focus, operations, and results. The EdPEx framework has been widely recognized as a strategic tool that supports higher education institutions in achieving sustainable excellence through structured and evidence-based management practices (Subcommittee on the Development and Enhancement of Education Quality Towards Excellence, 2021). In addition, previous studies have emphasized the importance of strategic implementation in higher education institutions. For example, research

on Suan Sunandha Rajabhat University highlights the significance of evaluating strategic success, examining its relationship with holistic quality management, and identifying challenges and obstacles in implementation. Such studies also emphasize the need to develop effective strategic driving mechanisms that can be applied as reference models for other educational institutions in the future (Phetaeng et al., 2024). Despite the growing adoption of EdPEX in higher education institutions, including Suan Sunandha Rajabhat University, several implementation challenges remain. These include difficulties in aligning performance indicators with institutional outcomes, insufficient integration of knowledge management systems, and limited personnel capacity to fully understand and effectively apply EdPEX criteria in practice. These gaps indicate that although the framework is well-established at a conceptual level, its operational effectiveness within institutions is still uneven and requires further empirical investigation.

Therefore, this research, entitled “A Study of the Quality of Self-Assessment According to the Education Criteria for Performance Excellence (EdPEX)”, aims to examine factors influencing the quality assurance process and the implementation of self-assessment based on EdPEX criteria. In particular, it seeks to explore the underlying patterns, conceptual approaches, and key organizational factors that affect the effectiveness of SAR implementation under the EdPEX framework. The findings of this study are expected to contribute to both theoretical and practical dimensions of educational quality assurance. Specifically, they aim to provide guidelines for improving the efficiency of internal quality assurance systems and strengthening a quality-oriented organizational culture. Ultimately, this research aspires to support the development of higher education institutions toward sustainable excellence in line with international quality standards.

Research of Objective

1. To study the factors related to the quality assurance operation and the self-assessment process according to the criteria for developing educational quality towards excellence (EdPEX).
2. To find the formats, concepts, and main issues that affect the self-assessment according to the criteria for developing educational quality towards excellence (EdPEX).

Literature Review

Educational Quality Assurance and EdPEX Framework

Quality assurance in higher education has become a central mechanism for ensuring institutional accountability, continuous improvement, and academic excellence. In Thailand, the Education Criteria for Performance Excellence (EdPEX), adapted from the Malcolm Baldrige National Quality Award framework, serves as a comprehensive model for evaluating institutional performance and quality development (Office of the Higher Education Commission [OHEC], 2013). The EdPEX framework emphasizes systems thinking, process management, and results-based evaluation, focusing on seven categories: leadership, strategic planning, customers, measurement and analysis, workforce, operations, and results. Prior studies indicate that effective quality assurance systems require strong institutional commitment, integrated management systems, and participatory evaluation mechanisms (Srikanok & Promsaka Na Sakolnakorn, 2016). Moreover, successful implementation of EdPEX depends on the alignment between organizational strategy and internal quality assurance (IQA) systems, ensuring that self-assessment processes are systematic, evidence-based, and continuous.

Factors Related to Quality Assurance Operations and Self-Assessment

The effectiveness of quality assurance operations in higher education institutions is influenced by multiple interrelated factors. These include leadership commitment, organizational culture, staff competence, availability of resources, and stakeholder participation (Sallis, 2014). Leadership plays a critical role in driving quality culture and ensuring that quality assurance processes are embedded in institutional practices rather than treated as administrative requirements. Additionally, the competency of personnel involved in self-assessment significantly affects the accuracy and reliability of evaluation outcomes. Institutions with well-trained quality assurance teams tend to produce more consistent and improvement-oriented self-assessment reports (Baird, 2017). Organizational culture that supports transparency, teamwork, and continuous improvement also enhances the effectiveness of EdPEX implementation. Furthermore, the availability of reliable data and information systems is

essential for evidence-based self-assessment. According to Evans (2015), data-driven decision-making strengthens the credibility of quality assurance systems and supports strategic improvement planning.

Self-Assessment under EdPEX Criteria: Concepts and Key Issues

Self-assessment under the EdPEX framework is a structured process that enables institutions to evaluate their performance against defined excellence criteria. It is not merely a compliance activity but a developmental tool aimed at identifying strengths, opportunities for improvement, and strategic gaps (OHEC, 2013). The concept of self-assessment in EdPEX is grounded in continuous improvement theory and organizational learning. It requires institutions to systematically collect evidence, analyze performance outcomes, and benchmark results against national and international standards (Evans, 2015). However, several challenges affect its implementation. Key issues identified in the literature include lack of understanding of EdPEX criteria, insufficient training of assessors, limited integration of data systems, and resistance to change within institutions (Srikanok & Promsaka Na Sakolnakorn, 2016). In many cases, self-assessment is perceived as a documentation burden rather than a strategic improvement tool, reducing its effectiveness. Another critical issue is inconsistency in interpretation of EdPEX criteria, which leads to variability in assessment quality across institutions. This highlights the need for standardized guidelines and continuous capacity building.

Theoretical Framework

This study is grounded in the Total Quality Management (TQM) theory and Organizational Learning Theory. TQM emphasizes continuous improvement, customer focus, and process optimization as key principles for achieving organizational excellence in the context of EdPEX, TQM provides a foundation for understanding how quality assurance operations should be systematically managed to achieve institutional excellence. Organizational Learning Theory further explains how institutions develop knowledge through experience, reflection, and adaptation. Self-assessment processes under EdPEX facilitate organizational learning by enabling institutions to evaluate performance, identify gaps, and implement improvements. Together,

these theories support the conceptualization of quality assurance operations and self-assessment as dynamic, iterative, and learning-oriented processes that contribute to educational excellence.

Research Methodology

In the study of the study of the quality of self-assessment according to the criteria for developing educational quality towards excellence (EdPEX), mixed methods research was used, using both quantitative and qualitative methods, to obtain comprehensive and in-depth data on the operating conditions and self-assessment in the educational quality assurance system according to the criteria for EdPEX (Education Criteria for Performance Excellence)

Part 1 (Quantitative) : Study the factors related to quality assurance operations and self-assessment processes from the population, including academic personnel and support personnel of the Suan Sunandha Rajabhat University, and the sample group by means of specific sampling, totaling 25 people, including:

- 5 executives
- 13 teachers
- 7 staff

Part 2 (Qualitative): In-depth interviews were conducted with administrators, teachers, and those responsible for quality assurance work to find patterns, concepts, and key issues reflecting quality assurance operations according to the EdPEX framework, and the classification and interpretation of data according to EdPEX criteria that affect self-assessment from a sample population using a specific sample selection method, totaling 10 people

Research Steps

Sample population Research instruments Data collection Instrument validation Data analysis and processing Research duration and Data presentation guidelines

Data Collection

In this research, the researcher collected data as follows:

1. Request permission from the administrators of the College of Innovation and Management to proceed with data collection.
2. Distribute questionnaires to personnel in the College of Innovation and Management who are the sample group and collect the questionnaires within the specified time period.
3. Conduct in-depth interviews with executives and those responsible for quality assurance, recording audio and taking notes.
4. Check the completeness and accuracy of the data before analyzing it.

Data Analysis

The researcher analyzed the data as follows:

1. Quantitative data General data were analyzed using descriptive statistics, including frequency, percentage, mean, and standard deviation. Analyze the relationship between factors related to quality assurance operations and self-assessment processes using inferential statistics such as:
 - Pearson's Correlation Coefficient
 - Multiple Regression Analysis
2. Qualitative Data Data from the interviews were analyzed using content analysis. And categorize and interpret data according to the EdPEX criteria to draw descriptive conclusions.

Research Results

From the research on the study of the quality of self-assessment according to the criteria for developing educational quality towards excellence (EdPEX), the researcher has collected quantitative and qualitative data from the sample group and analyzed the research results as follows:

Summarize the quantitative research results (with descriptive statistics including frequency, percentage, mean, and standard deviation)

1) Analysis of general data of the sample group found that the majority of the sample group was female, accounting for 52 percent. The average age of the sample group was between 36 and 45 years, accounting for 64 percent. The majority had a master's degree, accounting for 68 percent, and had more than 10 years of work experience, accounting for 36 percent.

2) The analysis of the relationship between factors related to quality assurance operations and the self-assessment process found that the overall mean of quality assurance operations and the self-assessment process was at the “high” level (Mean = 4.02, SD = 0.48). The categories with the highest scores were organizational leadership (Mean = 4.25, SD = 0.42) and strategic planning (Mean = 4.15, SD = 0.46), and the categories with the lowest scores were measurement, analysis, and knowledge management (Mean = 3.75, SD = 0.53) and operations (Mean = 3.80, SD = 0.50). The researchers analyzed the relationship between the related factors using inferential statistics as follows:

Table 1: Means and Standard Deviations of Quality Assurance Operations and Self-Assessment Processes

Category	Mean	S.D.	Interpretation	Rank
1. Organizational Leadership	4.25	0.42	High	1
2. Strategic Planning	4.15	0.46	High	2
3. Operations	3.80	0.50	High	4
4. Measurement, Analysis, and KM	3.75	0.53	High	5
Overall Average	4.02	0.48	High	-

From the Pearson's Correlation Coefficient analysis, it was found that there was a positive and statistically significant relationship at the level of 0.01 between the management's commitment and the level of quality assurance system implementation ($r = 0.68$, $p < 0.01$), and the personnel participation and internal communication were related to the self-assessment process ($r = 0.62$, $p < 0.01$).

Table 2: Correlation and Multiple Regression Analysis of Factors Influencing Quality Assurance Success

Predictor Variables	Correlation (r)	Significance (p)	Result
Leadership Commitment	0.68**	< 0.01	Positive Influence
Internal Communication	0.62**	< 0.01	Positive Influence
Personnel Participation	0.62**	< 0.01	Positive Influence

The multiple regression analysis revealed that leadership commitment and internal communication were significant positive predictors of quality assurance system implementation ($p < 0.05$). These factors collectively accounted for 55% of the variance in organizational performance (Adjusted $R^2 = 0.55$). Conversely, while human resources, technology, and budget appeared to be contributing factors, they did not reach statistical significance.

Summary of qualitative research results

1. Analysis of data from interviews using content analysis. Data from interviews with administrators, teachers, and staff, totaling 10 people, were analyzed in depth using content analysis to find patterns, concepts, and main issues that reflect the study of factors affecting the operation of the internal education quality assurance system according to the criteria for developing educational quality towards excellence (EdPEX). The results of the analysis found the following important issues:

1) Awareness and Understanding of EdPEX Criteria Most informants had a basic understanding of the structure and principles of EdPEX but lacked a deep understanding of how to link the different categories to the actual internal operations of Suan Sunandha Rajabhat University.

2) Organizational leadership and management play an important role in setting the direction, vision, mission, structure and supporting personnel to be aware of the quality of education. Communication within the organization is clearer, but development must still be increased to cover all levels and departments.

3) Strategic Planning (Strategy) College of Innovation and Management has prepared a strategic plan in line with the university's mission, with clear goals and indicators for monitoring and using data that can continuously improve the plan.

4) Focusing on service recipients and stakeholders (Customers), College of Innovation and Management places importance on student and stakeholder satisfaction. It conducts opinion surveys and uses the results to improve services. However, it lacks a systematic data collection and analysis system.

5) Measurement, Analysis and Knowledge Management found that quality data is being collected continuously, but there is still a lack of in-depth analysis systems and a shared central database. Knowledge management is still at a beginner's level, focusing more on exchange within the College of Innovation and Management than on systematic management.

6) The focus on workforce is to encourage personnel to be committed to their work and to cooperate in developing the quality of education. However, there is still a lack of systematic development in knowledge and understanding of the criteria for developing the quality of education towards excellence (EdPEX) and writing self-assessment reports (SAR).

7) Operations and Results Quality assurance operations have continued to progress and are beginning to show results in management and student satisfaction. However, some results are still unclear as the EdPEX assessment has only been implemented in recent years and comparative data is lacking.

2. Categorizing and interpreting data according to EdPEX criteria based on 7 categories of EdPEX criteria that are important for operations, writing self-assessment reports according to the criteria for developing educational quality towards excellence (EdPEX) by analyzing and summarizing descriptive results as follows:



Categorizing and interpreting data according to EdPEx criteria	
EdPEx Categories	Descriptive analysis results
Section 1: Organizational Leadership	The executives are committed to supporting operations and promoting an organizational culture that recognizes the quality of education within the College of Innovation and Management, ensuring that it meets the criteria for developing educational quality towards excellence (EdPEx).
Section 2: Strategic Planning	There are clear planning and strategy, but there is a lack of evidence-based data to support decision-making.
Section 3: Customer Focus	There is a focus on student and stakeholder satisfaction, but there is no systematic monitoring system and continuous data collection.
Section 4: Measurement, Analysis, and Knowledge Management	College of Innovation and Management still lacks a unified quality data collection system and the ability to systematically use analysis results for development planning.
Section 5: People Focus	College of Innovation and Management personnel have a positive attitude towards the quality assurance system but require further knowledge development and more specialized practitioners.
Section 6: Implementation	Quality assurance operations are systematically structured and have clear procedures, but there is a lack of serious evaluation of the effectiveness of the process.
Section 7: Results	There were positive results in terms of management and student satisfaction, but the measurement of outcomes still needs to be improved to better align with strategic indicators.

Research Discussion

Factors Related to Quality Assurance Operations and Self-Assessment According to EdPEX Criteria

The findings indicate that administrative leadership plays a fundamental role in driving the effectiveness of the quality assurance system and self-assessment processes in accordance with the Educational Quality Development toward Excellence (EdPEX) framework. Administrators are central in setting institutional vision, communicating strategic goals, and fostering organizational alignment. This finding is consistent with Siriyota (2023), who emphasized that leadership commitment is a critical determinant in the successful implementation of EdPEX criteria within higher education management. Similarly, Sparks (2018) highlighted that transformative leadership serves as the primary mechanism for embedding a culture of excellence and ensuring institutional alignment with quality assurance frameworks. Moreover, the study found that while the College of Innovation and Management has established strategic directions aligned with the university mission, the monitoring and evaluation mechanisms remain inconsistent. This limitation affects the continuity of quality assurance implementation. Kaplan and Norton (2014) argue that effective strategic planning requires continuous feedback systems to translate long-term objectives into operational outcomes. Without such mechanisms, strategic intent risks remaining at the conceptual level rather than being effectively implemented in practice. The presence of student and stakeholder satisfaction surveys reflects an effort to collect feedback; however, the absence of a structured monitoring system limits their utility in continuous improvement. This aligns with Sallis (2014), who asserted that total quality management in education requires more than data collection—it requires a systematic “listening post” capable of proactively responding to stakeholder needs and integrating feedback into decision-making processes. In addition, the study revealed deficiencies in the centralization and utilization of institutional data. In-depth interviews indicated the absence of an effective integrated database system to support decision-making and self-assessment processes. Davenport and Prusak (2010) emphasize that organizational excellence depends on advanced knowledge management systems that

transform raw data into actionable insights rather than serving merely as repositories of information. Finally, staff attitude and engagement were identified as important contributing factors in preparing Self-Assessment Reports (SAR). A positive organizational culture supports more effective implementation of quality assurance activities, consistent with Putiwattanachai and Boonphadung (2024). Furthermore, Isariyanan (2021) noted that administrators must actively utilize vision-driven leadership to achieve institutional goals. To address competency gaps, continuous professional development and regulatory training are essential, as highlighted by Noe (2017), who stressed that ongoing capacity building is necessary to achieve high-performance organizational standards.

Formats, Concepts, and Key Issues Affecting Self-Assessment According to EdPEX Criteria

The study further identified that the self-assessment process is influenced by both structural and conceptual factors, particularly the integration of data systems, evaluation mechanisms, and development planning. Although improvements in administrative efficiency and student satisfaction were observed, the linkage between evaluation results and strategic planning remains insufficiently developed. A critical issue identified is the weak integration between data collection, analysis, and strategic decision-making. This fragmentation limits the effectiveness of self-assessment in driving institutional improvement. In this context, the Plan–Do–Check–Act (PDCA) cycle provides a foundational conceptual framework for EdPEX implementation, emphasizing continuous alignment between planning, execution, evaluation, and improvement processes. However, the findings suggest that the “Check” and “Act” phases are not yet fully operationalized, resulting in a gap between evaluation outcomes and strategic development initiatives. This indicates that while data is collected, its systematic use for organizational learning and quality enhancement remains underdeveloped.

Overall, the study highlights that effective self-assessment under the EdPEX framework requires not only procedural compliance but also the establishment of integrated systems that connect leadership, data management, stakeholder feedback, and continuous improvement mechanisms into a coherent quality assurance ecosystem.

Conclusion

The study shows that the university has achieved a relatively high level of quality assurance implementation, with established systems for monitoring, evaluation, and maintaining academic standards. This reflects a strong institutional commitment to quality and continuous improvement. However, several structural and operational gaps still exist. Coordination between units is not always well integrated, and implementation practices are sometimes inconsistent, which reduces the overall effectiveness of the system. In particular, the university's use of data-driven decision-making remains limited, with decisions often relying more on experience than on systematic evidence and analysis. The knowledge management system also requires improvement, as information sharing across departments is fragmented and best practices are not consistently documented or utilized. In addition, weaknesses in leadership capacity and internal communication further affect the efficiency of quality assurance processes. To progress further under the EdPEX (Education Criteria for Performance Excellence) framework, the university needs to strengthen leadership, improve communication, and embed evidence-based decision-making into its daily operations. These improvements are essential for enhancing self-assessment practices and achieving sustainable institutional excellence.

Suggestions

Recommendations for the Public and Institutions

For higher education institutions, the findings suggest the importance of moving beyond procedural compliance toward a more evidence-based and collaborative quality culture. Policymakers may also consider supporting digital infrastructure and capacity-building programs that promote data use and knowledge sharing in universities.

Future Research Directions

Future research could explore comparative studies between universities implementing EdPEX at different maturity levels to identify best practices more clearly. Further studies may also examine the role of digital transformation in enhancing quality assurance systems, or investigate how organizational culture influences the success of data-driven decision-making in higher education institutions.

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