



THE CONFIRMATORY FACTOR ANALYSIS FOR DEVELOPING THE CHAN HUN MODEL “NEW APPROACH, QUALITY APPROACH”

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Received August 4, 2024; Revised August 25, 2025; Accepted September 4, 2025

Abstract

The study aims to 1) develop the "New Approach, Quality Approach" model to improve educational management at Chan Hun Bampen School, 2) evaluate the alignment of the "New Approach, Quality Approach" model with empirical data, and 3) present the model as a framework for enhancing the quality of educational management at Chan Hun Bampen School. The sample consists of 300 students from Chan Hun Bampen School, selected through systematic sampling for the 2022 academic year. The research instrument was a questionnaire that demonstrated a reliability coefficient of .893 and item validity ranging from .60 to 1.00. Data were analyzed using mean, standard deviation (S.D.), exploratory factor analysis (EFA), and confirmatory factor analysis (CFA).

1. The Chan Hun Model, “New Approach, Quality Approach,” for enhancing the education management quality at Chan Hun Bamphen School, has been developed in accordance with empirical evidence. The statistical analysis yields the following results: Chi-Square = 436.704, CMIN/DF = 1.009, DF = 443, P value = .441, GFI = .920, CFI = .999, TLI = .999, RMSEA = .005, RMR = 0.17, HOELTER = 331, all of which satisfy the established criteria.

2. The "New Approach, Quality Approach" model for enhancing the quality of educational management at Chan Hun Bampen School consists of four key components: 1) Efficiency of Learning (LE), encompassing 9 variables; 2) Quality of Learning (LQ) 4 variables; 3) Opportunities for Learning (LP), consisting of 5 variables; and 4) Safety Education (LS), including 4 variables for improvement of educational management quality at Chan Hun Bampen School.

Keywords: Efficiency of Learning (LE), Quality of Learning (LQ), Opportunities for Learning (LP), Safety Education (LS)



Introduction

At present, schools must adapt their management frameworks to enable widespread learning opportunities. The Ministry of Education mandates new pedagogical approaches, emphasizing restructuring management practices for safety, reducing extracurricular activities, and establishing distance and online learning infrastructure. (Ministry of Education, 2021) This aligns with the Ministry of Education's Strategic Plan (2020-2022), outlining strategies for advancing digital technology systems in education. This includes expanding digital learning channels, providing high-speed internet for all educational institutions, establishing digital platforms, promoting digital teaching materials, implementing Big Data systems, and acquiring standardized equipment. (Office of the Basic Education Commission, 2023)

Following the National 20-Year Education Strategy (B.E. 2561-2580), the Basic Education Commission Office has announced policies for fiscal year 2023. These involve reforming learning methods, updating teachers' roles, improving education management efficiency, and establishing an internationally recognized education system. This signals a shift from the “New Approach, Quality Approach” to the “OBEC New normal, Quality way.” paradigm for fiscal year 2023. The outlined initiatives include: 1) Ensuring safety and promoting media literacy, 2) Addressing educational disparities and enhancing opportunities, 3) Fostering quality through competency development among learners, educators, and staff, alongside essential education management systems for the 21st century, and 4) Enhancing efficiency through improved educational management, internal quality assurance, and technology-driven teaching innovations. (Office of the Basic Education Commission, 2020)

Therefore, the school must follow the Basic Education Commission Office's policies, implementing measures that align securely with the advancement of information technology in education. This involves providing comprehensive learning opportunities and conducting research to accelerate understanding among teachers, students, and stakeholders about upcoming educational changes.

Research Objective

1. To develop the Chan Hun Bampen model “New Approach, Quality Approach” for the enhancement of the educational management quality at Chan Hun Bampen School.
2. To confirm the alignment of the Chan Hun Bampen model “New Approach, Quality Approach” with perceptual data in improving educational management quality at Chan Hun Bampen School.



3. To present the Chan Hun Bampen model “New Approach, Quality Approach” for enhancing the quality of educational management at Chan Hun Bampen School.

Literature Review

The primary aim of this research was to investigate the factors that influenced the efficiency of the educational management quality at Chan Hun Bampen School in accordance with the Chan Hun Bampen concept “New Approach, Quality Approach”. This has studied theoretical concepts related to factors influencing the enhancement of educational management at Chan Hun Bampen School. By studying various theories as follows: Future Path Policy, Quality Pathway of the Office of the Basic Education Commission, Learning Efficiency Theory and Learning Management Theory (LMT) such as Pedagogical Analysis,

A surface level of analysis, Levels of Psychological Analysis, Quality Education Theory such as 3Rs8Cs Model, Learning Opportunities, Learner safety and Effective teaching methods. (Office of the Basic Education Commission, 2020; Office of the Basic Education Commission 2023; Ministry of Education, 2021; Kline, 1998)

Conceptual Framework

Based on the literature reviews of each variable that influenced the efficiency of the educational management quality at Chan Hun Bampen School in accordance with the Chan Hun Bampen concept “New Approach, Quality Approach”. The following conceptual framework in Figure 1 illustrated the interrelationships among the 4 component factors that enhanced the efficiency of the educational management quality at Chan Hun Bampen School: Efficiency of Learning (LE), which has 10 observed variables, Quality of Learning (LQ), which has 9 observed variables, Opportunities for Learning (LP) has 7 observed variables, and Safety Education (LS) has 7 observed variables, as presented in Table 1 below.

Table 1 Describes the latent variables, their associated observed variables, and the related questionnaire items, defined as X1–X33.

Latent Variables	Observed Variables	Questions
Efficiency of Learning (LE)	X1	The institution has a well-defined policy that encourages the use of information technology as a primary tool for instruction.
	X2	The institution supports the implementation of educational innovations in institution administration and promotes stakeholder participation in their development.



Latent Variables	Observed Variables	Questions	
Quality of Learning (LQ)	X3	To improve instructors' and learners' comprehension and proficiency in utilizing technology for instruction, the institution offers capacity-building programs.	
	X4	The institution promotes active learning techniques while implementing learners-centered instruction.	
	X5	During regular times and during the COVID-19 epidemic, the institution supervises, monitors, and assesses learning management, including the utilization of technology.	
	X6	Supported by the institution's accessibility of technology for learning and information retrieval, learners indicate pleasure with active learning methods.	
	X7	The institution works well with families and makes good use of information technology for online instruction.	
	X8	To enhance instructional administration, the institution makes excellent use of digital technologies and data management systems.	
	X9	In regular circumstances and during public health emergencies like COVID-19, the institution continuously upholds quality assurance requirements.	
	X10	In order to fulfill the demands of the "new normal" that has emerged since the COVID-19 pandemic, the institution has enhanced its instructional management.	
	X11	Since the epidemic, the institution has developed strategic strategies to adapt to future changes in education.	
	X12	The institution's education management policies are designed to help learners acquire skills that are relevant to the twenty-first century.	
	X13	Instructors have a high level of proficiency in providing interesting and excellent instruction.	
	X14	In classrooms the instructors often use creative, entertaining, and high-quality learning activities.	
	X15	Instructors is capable of using information technology into their lesson plans and has the requisite abilities.	
	X16	Learners have strong thinking abilities that allow them to use problem-solving techniques in both their academic and everyday lives.	
	X17	Learners exhibit the capacity to communicate and study using information technology in an original and moral way.	
	X18	Learners demonstrate flexibility and life skills that allow them to lead fulfilling lives in the modern world.	
	X19	Learners now possess career-related skills that complement their aptitudes and interests.	
	Opportunities for Learning (LP)	X20	The institution provides cutting-edge instructional techniques that improve the job prospects of the upcoming generation of learners.
		X21	The institution encourages instructors and learners to use technology to enhance their access to education, information, and creativity.
X22		The institution has created a successful technology-based evaluation system that guarantees relevance, accuracy, and clarity.	
X23		To increase learners' access to high-quality learning materials, the institution encourages the creation of educational media via information technology.	
X24		In order to guarantee the safety and wellbeing of learners, the institution is ready to offer extensive online learners support services in coordination with parents.	
X25		The institution provides multilingual foreign language courses that are tailored to the skills and interests of the learners.	



Latent Variables	Observed Variables	Questions
Safety Education (LS)	X26	To help learners reach their full potential, the institution offers elective courses that address both learners and social demands today.
	X27	In reaction to new outbreaks of contagious diseases, the institution has changed its curriculum to place a greater emphasis on safety.
	X28	Based on each learner's unique aptitudes, the institution monitors and supports their access to ongoing education, additional coursework, and appropriate employment.
	X29	The institution has put in place teaching and learning techniques that guarantee secure learning environments in both routine and emergency situations.
	X30	Safety for instructors, staff, learners, and stakeholders is a top priority when the institution implements education management practices.
	X31	To shield learners from different risks, the institution keeps its physical learning spaces safe.
	X32	By encouraging media literacy, the institution equips learners to choose and assess media content critically.
	X33	In compliance with digital safety guidelines, the institution promotes instructors and learners appropriate and lawful use of educational applications.



Figure 1: Conceptual Framework



Methodology

The study titled “The Confirmatory Factor Analysis for Developing the Chan Hun Model “New Approach, Quality Approach” employed a mixed methods research design, utilizing a Confirmatory Factor Analysis (CFA) framework. The research methodology encompassed the following procedural steps:

1. Populations and Samples

The population consisted of the total number of students at Chan Hun Bampen School is 630 under the jurisdiction of the Secondary Educational Service Area Office Bangkok 2, for the academic year 2022. The sample group comprised 300 students, who were systematically selected through a Simple Random Sampling technique. They were categorized by grade: 45 in grade 7, 45 in grade 8, 53 in grade 9, 56 in grade 10, 48 in grade 11, and 53 in grade 12.

2. Measurements

The survey instrument that assessed educational management for enhance efficiency of the educational management quality at Chan Hun Bampen School comprised 4 latent variables and comprised 33 items covering Efficiency of Learning (LE), Quality of Learning (LQ), Opportunities for Learning (LP), Safety Education (LS). Using a 5-point rating scale. Instated content validity, with all items having content validity index (CVI) values falling within the range of 0.60 to 1.00 and the reliability of .893. Moreover, the questionnaire exhibited a notably high level of reliability, with a Cronbach's Alpha coefficient of (α -0.993).

3. Statistical Methods

The researcher collected complete data from a sample of 300 students.

The initial data analysis had two primary components, it explored the demographic profiles of the sample group through descriptive statistics, including frequencies and percentages. Second, it assessed the Likert-scale questionnaire data using statistical parameters like mean, standard deviation, coefficient of variation (CV), skewness, and kurtosis to understand variable distribution and variability characteristics.

The research analysis, conduct an Exploratory Factor Analysis (EFA) to investigate the relationships among variables and reduce their quantity. The procedure involves: Factor Extraction Retain factors with Eigen values greater than 1, explaining a minimum of 60% variance (Punpukdee, 2016). utilizing Principal Component Analysis (PCA). Ensure that factor loadings in the matrix are statistically significant (>0.05), while not exceeding 50% (Joreskog & Sorbom, 1996). Perform Orthogonal Rotation, specifically employing the



Varimax method. Assign meaning to factors, with factor loadings greater than 0.5 for two or more variables. (Hair et al., 2006).

Conduct Confirmatory Factor Analysis (CFA) to scrutinize the theoretical model, aiming to alleviate the limitations of Exploratory Factor Analysis. The procedure includes preparing the correlation matrix, extracting the initial factors, rotating the factors, and generating composite variables or factor scales. The analysis to verify the conformity of the structural equation model with observational data utilizes parameter estimation through Maximum Likelihood (ML) and goodness-of-fit indices such as Goodness of Fit Index (GFI), Comparative Fit Index (CFI), Standardized Root Mean Square Residual (SRMR), and Root Mean Square Error of Approximation (RMSEA) (Kline, 1998; Tirakanan, 2011; Angsuchoti et al., 2011). Criteria for joint consideration are as follows: χ^2 should not be statistically significant, χ^2/df should not exceed 5, GFI should be at least 0.9, AGFI should be at least 0.9, CFI should be at least 0.9, and RMSEA should not exceed 0.08.

Results

Table 2 Mean and Standard Deviation of Students' Perceptions Regarding Factors Related to the Development of Educational Management at Chan Hun Bampen School.

Factors	Item	\bar{X}	S.D.	Level of agreement
Efficiency of Learning (LE)	10			
Overall average of factors related to Learning Efficiency		4.02	0.29	Agree
Quality of Learning (LQ)	9			
Overall average of factors related to Quality of Learning		3.90	0.50	Agree
Opportunities for Learning (LP)	7			
Overall average of factors related to Learning Opportunity		4.17	0.11	Agree
Safety Education (LS)	7			
Overall average of factors related to Learner Safety		4.06	0.10	Agree

Table 2 presents students' perceptions of factors related to the development of educational management at Chan Hun Bampen School. The findings indicate high levels of Efficiency of Learning (mean = 4.02, SD = 0.29), Quality of Learning (mean = 3.90, SD = 0.50), Opportunities for Learning (mean = 4.17, SD = 0.11), and Safety Education (mean = 4.06, SD = 0.10). Notably, 8 statements scored highest, 24 scored high, and 1 scored moderate on average.



Table 3 Summary of Kaiser-Meyer-Olkin and Bartlett’s Test on factorability of the 33-item

KMO and Bartlett’s Test of Sphericity	
Approx. Chi-Square	3819.722
df	528
P	P<.001
Kaiser-Meyer-Olkin Measure of Sampling Adequacy: KMO	.800

Table 3 The results of the Cronbach Alpha and KMO test have been shown in Table 2 in detail. The value of KMO is found to be .800. The appropriate KMO value ranges between 0.5 and 1.0, and Bartlett’s test of Sphericity should be statistically significant (Sig. < 0.05) (Kaiser, 1974; Raj & Jain, 2013). The results show Chi-Square = 3819.722 and $p < .001$ indicating that the data from the students of Chan Hun Bampen School are suitable for exploratory factor analysis.

Table 4 The component weights following axis rotation were derived using the Varimax method, showing only factor loadings exceeding 0.5

Factor	Indicator	Factor Loading	Factor Score	
			Min	Max
Efficiency of Learning (LE)	X ₄	.838	-2.2683	1.6987
	X ₇	.717		
	X ₂₁	.704		
	X ₁	.691		
	X ₁₅	.676		
	X ₆	.673		
	X ₁₂	.595		
	X ₉	.592		
	X ₂₂	.590		
	X ₁₀	.561		
	X ₃	.510		
Opportunities for Learning (LP)	X ₅	.604	-3.3109	2.2032
	X ₈	.552		
	X ₂₉	.510		
	X ₂	.503		
Quality of Learning (LQ)	X ₂₃	.576	-2.3312	2.3695
	X ₂₈	.575		
Safety Education (LS)	X ₃₃	.722	-2.3765	2.3653
	X ₂₄	.684		

Table 4 presents the component weights for Efficiency of Learning (LE) (QL) with 12 indicators, ranging from 0.838 to 0.505, accounting for 14.055% of the variance. The



learning efficiency (PL) component has 4 indicators, with weights from 0.604 to 0.503, explaining 8.055% of the variance. The component for creating learning opportunities (OL) has 2 indicators, with weights of 0.576 and 0.575, accounting for 6.910% of the variance. Lastly, the learning safety (SL) component includes 2 indicators with weights of 0.722 and 0.684, accounting for 6.060% of the variance.

The statistical values before adjustment indicating the consistency of the Chan Hun “New Approach, Quality Approach” model in enhancing educational management at Chan Hun Bamphen School. The results are depicted in Figure 2.

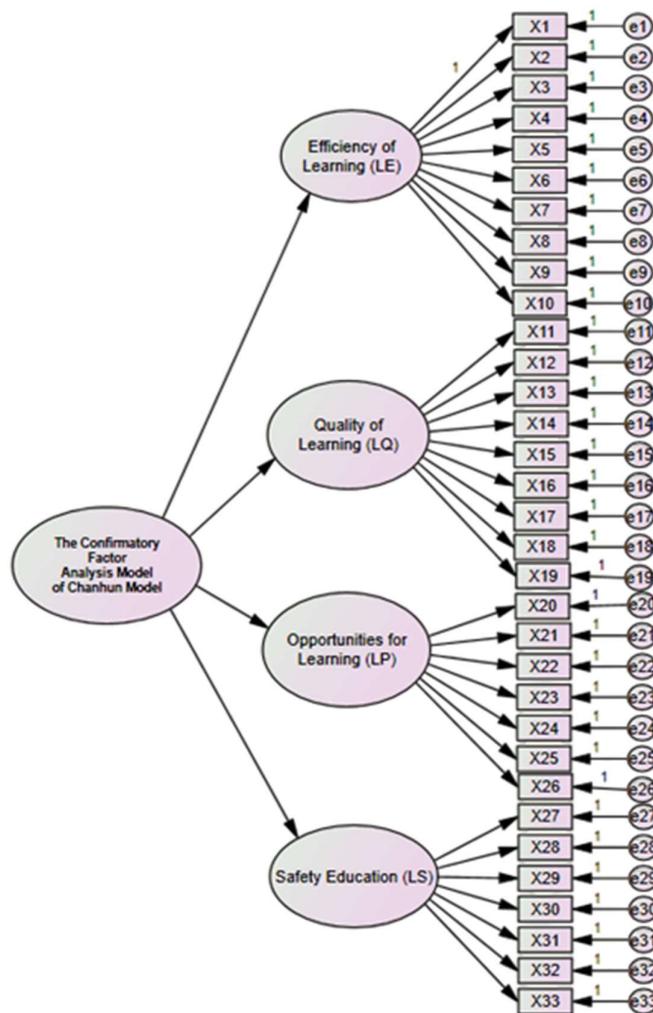
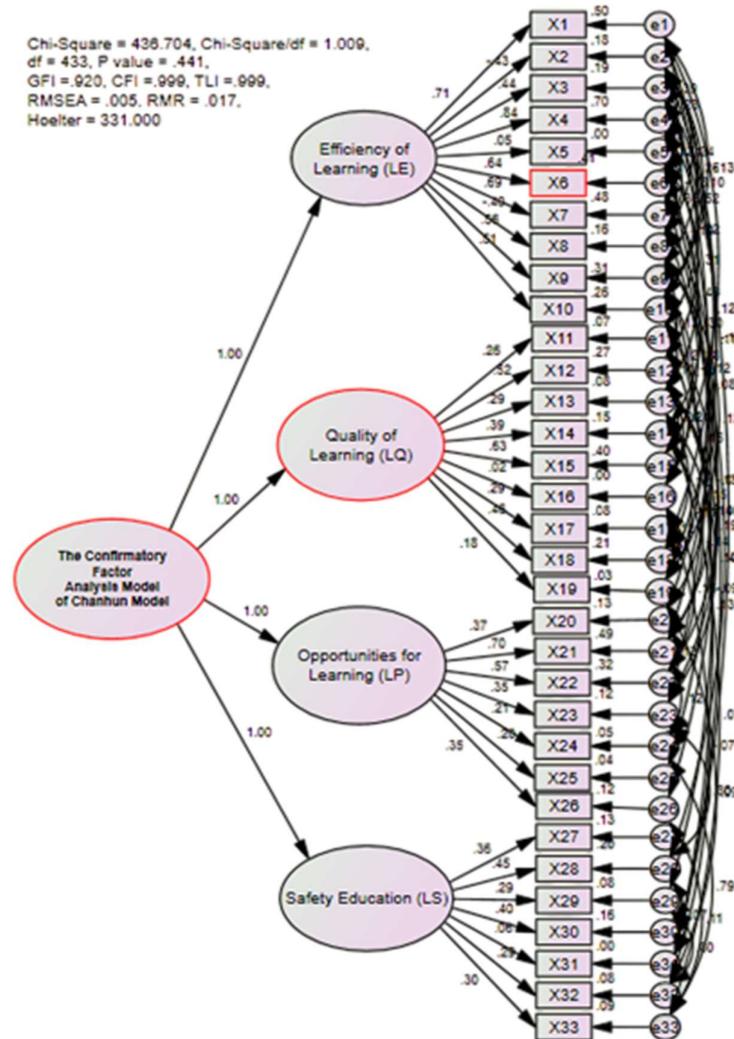


Figure 2 Before adjustment the Chan Hun “New Approach, Quality Approach” model for enhancing educational management at Chan Hun Bamphen School.

In the confirmatory factor analysis of the Chan Hun “New Approach, Quality Approach” model for educational management at Chan Hun Bamphen School (QOPSL

Model) after adjustment, four dimensions were examined: Efficiency of Learning (LE), Quality of Learning (LQ), Opportunities for Learning (LP), Safety Education (LS), comprising a total of 33 observed variables. The results are depicted in Figure 3.



Chi-Square = 436.704, CMIN/DF = 1.009, DF = 443, P value = .441,
GFI = .920, CFI = .999, TLI = .999, RMSEA = .005, RMR = 0.17, HOELTER = 331

Figure 3 Adjusted the Chan Hun “New Way, Quality Way” model for enhancing educational management at Chan Hun Bamphen School with standardized estimates.

**Table 5** The Component Fit Measure by checking several fit indices (After Adjustment)

Index	Criteria	Statistics	Pass
P-value	> 0.05	.441	✓
CMIN/DF	≤ 3	1.009	✓
RMSEA	≤ 0.08	.005	✓
RMR	≤ 0.05	0.17	✓
CFI	≥ 0.9	.999	✓
GFI	≥ 0.9	.920	✓
TLI	≥ 0.9	.999	✓

Factor Loading $\geq .30$ are accepted for variables.

From Table 5, the confirmatory factor analysis indicates that Chi-Square = 436.704, CMIN/DF = 1.009, DF = 443, P value = .441, GFI = .920, CFI = .999, TLI = .999, RMSEA = .005, RMR = 0.17, HOELTER = 331, all the values meeting the criteria. These results confirm the alignment of the QOPSL Model with empirical data.

Discussion

The discussion on Objective 1, aimed at refining the “New Approach, Quality Approach” model to improve the quality of educational management at Chan Hun Bamphen School, proposes educational guidelines. These aim to establish a framework for school management based on Basic Education Commission policies. These policies outline objectives to foster morally upright, skilled, and virtuous students of all ages, in line with the 20-year National Education Strategy (2018-2037). Students, Teachers, and Administrators must exhibit adaptability and collaboration to achieve educational goals aligned with policies, focusing on safety, opportunities, reducing disparities, quality, and efficiency (Office of the Basic Education Commission, 2020) After reviewing these guidelines, it is possible to synthesize them into four cohesive and interconnected components: Quality of Learning (9 variables), Learning Efficiency (10 variables), Learning Opportunity (7 variables), and Learning Safety (7 variables), totaling 33 variables.

The discussion on Objective 2, focused on evaluating the alignment of the Chan Hun “New Approach, Quality Approach” model for enhancing educational management quality at Chan Hun Bamphen School with empirical data, involved an Exploratory Factor Analysis (EFA). This analysis scrutinized the relationship among student opinion data, confirming its suitability. Results showed a Kaiser-Meyer-Olkin (KMO) value above 0.50, indicating interrelation among the 33 variables, suitable for EFA. After conducting the Exploratory Factor Analysis (EFA), it was found that there were 20 viable factor variables. Subsequently, the researchers performed Confirmatory Factor Analysis (CFA) using the



First Order model. The analysis revealed the following statistical values: Chi-Square = 436.704, CMIN/DF = 1.009, DF = 443, P value = .441, GFI = .920, CFI = .999, TLI = .999, RMSEA = .005, RMR = 0.17, HOELTER = 331, all meeting the established criteria (Kline, 1998; Tirakanan, 2011; Angsuchoti et al., 2011). The model aligns with empirical data, comprising 4 components and 17 variables. The components and their variables are as follows: Component 1, Efficiency of Learning (LE), refers to the educational outcomes from the implementation of effective management policies, encompassing 9 variables. Component 2, Quality of Learning (LQ), pertains to the instructional processes used in teaching and comprises 4 variables. Component 3, Opportunities for Learning (LP), involves strategies to promote and monitor student access to educational resources, encompassing 5 variables. Component 4, Safety Education (LS), entails providing safety services for students, teachers, and educational personnel within the institution, with 4 variables. These components are integral to the Chan Hun Model “New Approach, Quality Approach,” also known as the QOPSL Model.

Discussion of the results from Objective 3, based on the variables obtained from Objective 2, which were used to create the Chan Hun “New Approach, Quality Approach” model (QOPSL MODEL). The synthesis identified four key components, which form the basis of a model aimed at improving the quality of education management at Chan Hun Bampen School.

New Knowledge through Research

1. Provides a management approach for teaching and learning that aligns with government policies, offering diverse and inclusive opportunities for learners.
2. This approach enhances the effectiveness of academy and improves learners' quality according to their specific contexts.
3. Provides a Model of Educational Management that other academy can adapt to fit their own contexts, aiming to elevate the effectiveness of academy and the quality of learners to achieve optimal results in line with current educational management practices. Chan Hun Bampen School “New Approach, Quality Approach,” (QOPSL MODEL), as shown in Figures 4.

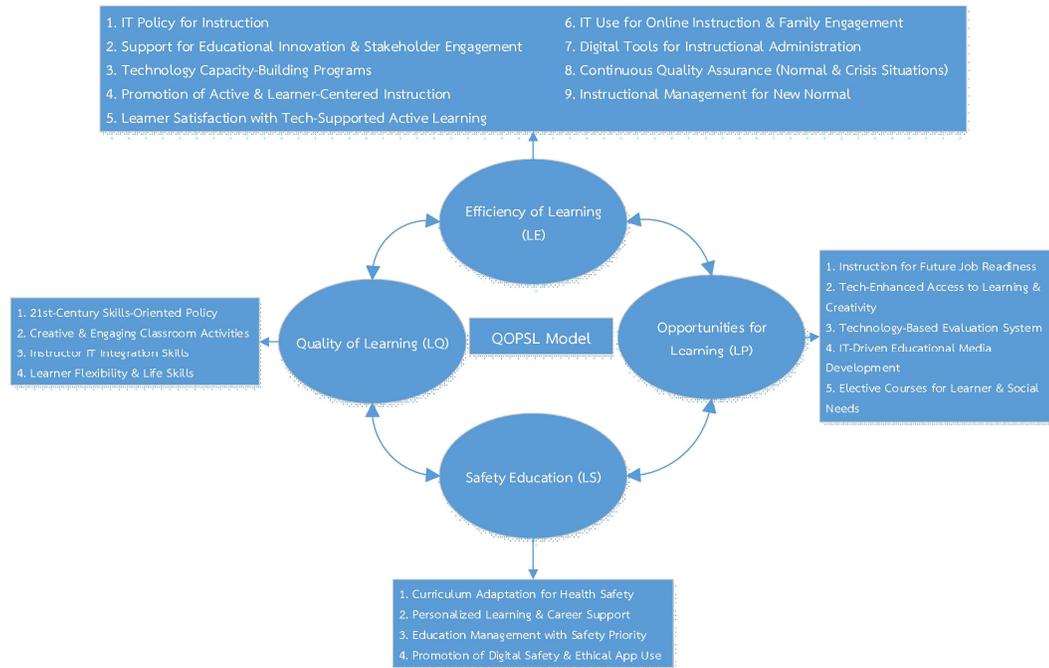


Figure 4 Illustrates the Interrelationships in The Chan Hun Model “New Approach, Quality Approach” for enhancing educational management at Chan Hun Bamphen School (QOPSL Model).

Conclusion

The objective of this study was to develop the Chan Hun Model "New Approach, Quality Approach" for enhancing educational management at Chan Hun Bamphen School and to examine the model's alignment with empirical data. The study also aimed to present the Chan Hun Model "New Approach, Quality Approach" so that other academy could adapt it to their own contexts. The research involved 300 students from Chan Hun Bamphen School for the academic year 2022. Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were employed to assess the model's fit.

The results revealed that the Chan Hun Model "New Approach, Quality Approach" for developing educational quality at Chan Hun Bamphen School consists of four factors: 1) Quality of Learning (QL) with 10 variables, 2) Performance of Learning (PL) with 3 variables, 3) Opportunity for Learning (OL) with 2 variables, and 4) Safety of Learning (SL) with 2 variables. The developed model demonstrated a good fit with the empirical data, with the following statistical indicators: Chi-Square = 436.704, CMIN/DF = 1.009, DF = 443, P value = .441, GFI = .920, CFI = .999, TLI = .999, RMSEA = .005, RMR = 0.17, HOELTER = 331, all meeting the criteria.



The analysis suggests that educational management aimed at promoting effective teaching and learning should incorporate principles and policies aligned with advancements in information technology, ensuring safety, efficiency, inclusiveness, and quality. It is crucial to enhance understanding among teachers, students, and stakeholders about significant changes in teaching practices to appropriately adjust educational management strategies. The academy also highlights that institutions should prioritize and expedite the development of factors influencing teaching and learning effectiveness, focusing specifically on the four components: Efficiency of Learning (LE), Quality of Learning (LQ), Opportunities for Learning (LP), Safety Education (LS).

Recommendation

1. Recommendation for Implementation

1.1 Educational institutions can utilize top-scoring questions from research to develop management guidelines for quality learning, efficiency, opportunities, and safety, aligning with the Basic Education Commission.

1.2 Board of Directors can utilize research outcomes to craft supportive policies for educational management, addressing quality learning, efficiency, opportunity creation, safety, and other relevant areas, facilitating future planning.

2. Recommendation for Future Research

2.1 This study aims to develop educational management strategies to improve the quality, efficiency, opportunities, and safety of learning for secondary school students at Chan Hun Bamphen School. Future research should broaden its focus to include various educational levels for a comprehensive understanding of foundational education.

2.2 it is recommended to explore additional variables such as the effects of learning management and student involvement in learning management.

2.3 Additionally, further investigation into areas like Active Learning management is essential, considering its vital role in cultivating students' 21st-century skills, which encompass quality skills including the 3Rs and 8Cs.

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