

Factor analysis for building trust in secondary school administrators: Confirmatory factor analysis

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Abstract: This study intends to investigate the components and indicators of trust of secondary school administrators and the fit of the model of components and indicators of trust in the Northeastern area, Thailand. The design for this research is mixed-methods research under a multi-phase design. Phase 1 aims to determine the elements and dimensions of trust in principals. This is done by a review of literature and study of literature related to trust in trustees, which is then expert-rated. Qualitative data were analyzed using content analysis. Phase 2 confirms the goodness-of-fit of trust components and indicators among secondary school administrators in the northeast of Thailand. The sample includes four hundred principals and secondary school teachers from the Northeast region. The data were analyzed to examine model fit using CFA. Study of the components of trust in secondary school administrators and their indicators revealed five main components: Competence, Benevolence, Integrity, Reliability, and Openness. The goodness-of-fit indices of the model analyzed in secondary school administrators' trust factor consist of: 1) model of the components of trust among secondary school administrators in Thailand's Northeastern region: $\chi^2 = 72.887$, $df = 57$, $\chi^2/df = 1.279$, $p\text{-value} = 0.0764$, comparative fit index (CFI) = 0.998, Tucker-Lewis index (TLI) = 0.997, root mean square error of approximation (RMSEA) = 0.026, and standardized root mean square residual (SRMR) = 0.008.

Keywords: Secondary school administrators, Trust in administrators.

1. Introduction

According to research findings from the Harvard Business Review, Lewis [1] points out that trust is the foundation of most successful businesses. It is one of the most thoroughly scrutinized concepts across various disciplines, including sociology, political science, psychology, economics, management, philosophy, and medicine. While trust remains a skeptical topic of common understanding. Waree [2] emphasizes that trust is necessary for a society to exist at all.

A global survey on trust and its application in organizational development in 2000 by the Harvard Business School's Institute for the Study of Business in Global Society, in collaboration with The Edelman [3], shows that trust is regarded today as one of the most important forms of capital that leaders can bring into play. Despite today's general turbulence and unpredictability, people are increasingly looking to their leaders. Thanetsunthorn and Wuthisatian [4] study revealed that trust is a basic assumption in business economics and other social sciences; moreover, trust embodies this belief. On a wider level, trust is among the most important factors indispensable for success in organizational development.

When people trust one another, especially when they trust the organization's leaders, it is easy for them to work in a highly cooperative atmosphere. Employees will freely put forward constructive opinions, propose new ideas, and be enthusiastic about experimenting with different ways of working. In the end, team and organizational efficiency are raised while obstacles to coordination are reduced; the working environment improves.

In contrast, in an organization where trust is absent, employees will start to detach from work relationships, stop being willing to open up, and may even resign. They concentrate only on themselves instead of the common goal, bringing frustration to their work. Hence, Blanchard et al. [5] assert that trust is not only morally good; it is essential for an organization to succeed. Trust in top management positively affects several aspects of organizational work, such as organizational commitment and apparent job satisfaction. Personnel who trust their top management are more willing to stay in the organization and continually use their full abilities. This, in turn, reduces turnover, inspires better cooperation among personnel, and eventually leads to higher performance and organizational success [6]. This aligns with Noisirisuk [7], who states that when trust is strong within the organization and its leaders, organizational performance will surely be excellent. Everyone will feel pride in their work and role as a member of the organization.

Institutions of learning need their own leaders, the school administrators. These individuals are organizational leaders with a special focus on education. Their primary task is to develop learners, which relies on trust from all concerned. Trust becomes central to a smoother enterprise at work and helps make cooperative efforts among colleagues fruitful within the school. When trust is present, administrators and teachers can collaborate better in improving educational management quality, directly affecting student development success. It also helps raise teacher professionalism and active participation in decisions concerning school development, while reinvigorating morale [8].

This is supported by Laisanitsereekul et al. [9], who briefly stated the importance of trust among staff. The trust teachers have in their administrators is indeed a decisive matter; one is a DM role model. If management can establish such trust among the teaching staff, it undoubtedly brings about both work efficiency and the desired quality of educational results. Although trust is viewed as an internal human emotion that cannot be well-defined and is highly abstract, it has a direct bearing on work organization effectiveness. Therefore, if trust is cultivated between teachers and heads of state, work efficiency will increase while educational results improve [10].

An extensive study of literature revealed that much of the research to date has concentrated primarily on creating indicators to measure trust in primary school principals or on giving them strategies about how to be trustworthy leaders. It is unclear whether there is yet any compilation or convenient manual for practices clarifying what is known about building trust among secondary school administrators. For this reason, we will develop an integrated model that considers both the historical particularities and the unique present-day difficulties facing secondary school administrators.

Now, this researcher feels there is a pressing need for research on developing a model to foster trust among secondary school administrators in the Northeastern region. This will result in a clarified, measurable model offering administrators practical directions on how to present themselves, create a conducive atmosphere, and achieve teamwork efficiently. At the same time, it creates an influential corporate culture that encourages independent living, original work, and staff adherence to an idea with its own life. There will be more efficient administrative collaboration between senior and middle employees in the district if trust is established. This is what leads teachers to need their school heads, someone who can let them concentrate on their work. Following this path should lead to academic quality being elevated across the region.

However, when conditions are right for trust between administrators and teachers, it can collectively rise even more quickly into spheres that uplift educational management quality, ultimately enhancing the region from which it has come.

2. Background of the Study

Trust in Administrators refers to a positive perception of their management behavior. Forming trust in administrators constitutes an important management principle for successful organizations. It is also a necessity for strong ties between personnel members to move the organization forward in one direction with stability and long-term sustainability, which administrators must prioritize and consider most important [1].

Trust within the academic context of a secondary school involves diverse staff roles requiring coordination and collaboration. Trust in administrators fosters an amiable work climate and enhances the school's capacity for teamwork. It is essential for achieving organizational goals, and supporting Quality Educational Management sustains positive, forward-moving change [11].

Assortment Trust provides paybacks in secondary school administrators' work from several angles, including cooperation, organization building, management sphere, beneficial results, and the establishment of a good organizational culture. These are the contributions of trust in school administration [12]. As such, trust in school administrators is seen as the most important way to promote administrative effectiveness and positive relations within a school institution between the administration and personnel. These all contribute to this organizational basis, which can guarantee systematic and sustained success in educational management over time.

Furthermore, unlike all other regions of China, school administrators in northeastern provinces face particularly complex trust challenges. On the one hand, it is a veritable "Northeast of Educators College" (xueyuqu), yet so far, few schools have effectively implemented school administration in practice. As a result, school administrators must lead the reform of organizational operations to better manage limited human resources and time. This is crucial for guiding their educational institutions toward predetermined goals.

Only very few independent studies have been conducted directly on trust in school administrators. However, the present context introduces new complexities. As one component of trust in the administrator, the author analyzed it using various frameworks developed by academics, such as [12-16]. A few examples are how easy or difficult it is for new teachers to SHARA ("make money"), [5]; whether the boss says I can do my work in peace without having anyone look over my shoulder, or he/she says, Not so fast. Who do you think you are? [6]

Trust in the administrator, this study predominantly adhered to the concepts of Professor Megan Tschannen-Moran, a leading scholar in trust in education. The premise was that any core concept that obtained 15 percent or more agreement among reviewed sources could be considered data related to core components of trust in administrators. In this way, the five core components and fifteen subcomponents of trust in administrators identified by the review of literature and the repeated surveys set out below are as follows: Competence: Professional Performance, Logical Reasoning, and Goal Achievement. Benevolence: Attention, Generosity, and Establishing Relationships of Trust. Integrity: Being Honest, Being Honest, and Being Fair. Reliability: Setting Examples, Responsibility, and Having Rules. Openness: Telling the truth, Being Open, and Offering opportunities.

Based on the literature review above, the researcher presents the expected relationship between the independent and dependent variables in a conceptual framework (Figure 1). This framework defines the objectives of this research: 1. to study the components and indicators of trust for secondary school administrators. 2. To examine the congruence of the model of components and indicators of trust for secondary school administrators in the Northeastern region. In summary, this research proposes that five independent components influence trust for secondary school administrators in the Northeast. This conceptual framework is used as a research process to plan and connect these five variables, allowing for a systematic conclusion. Figure 1 shows the conceptual framework.

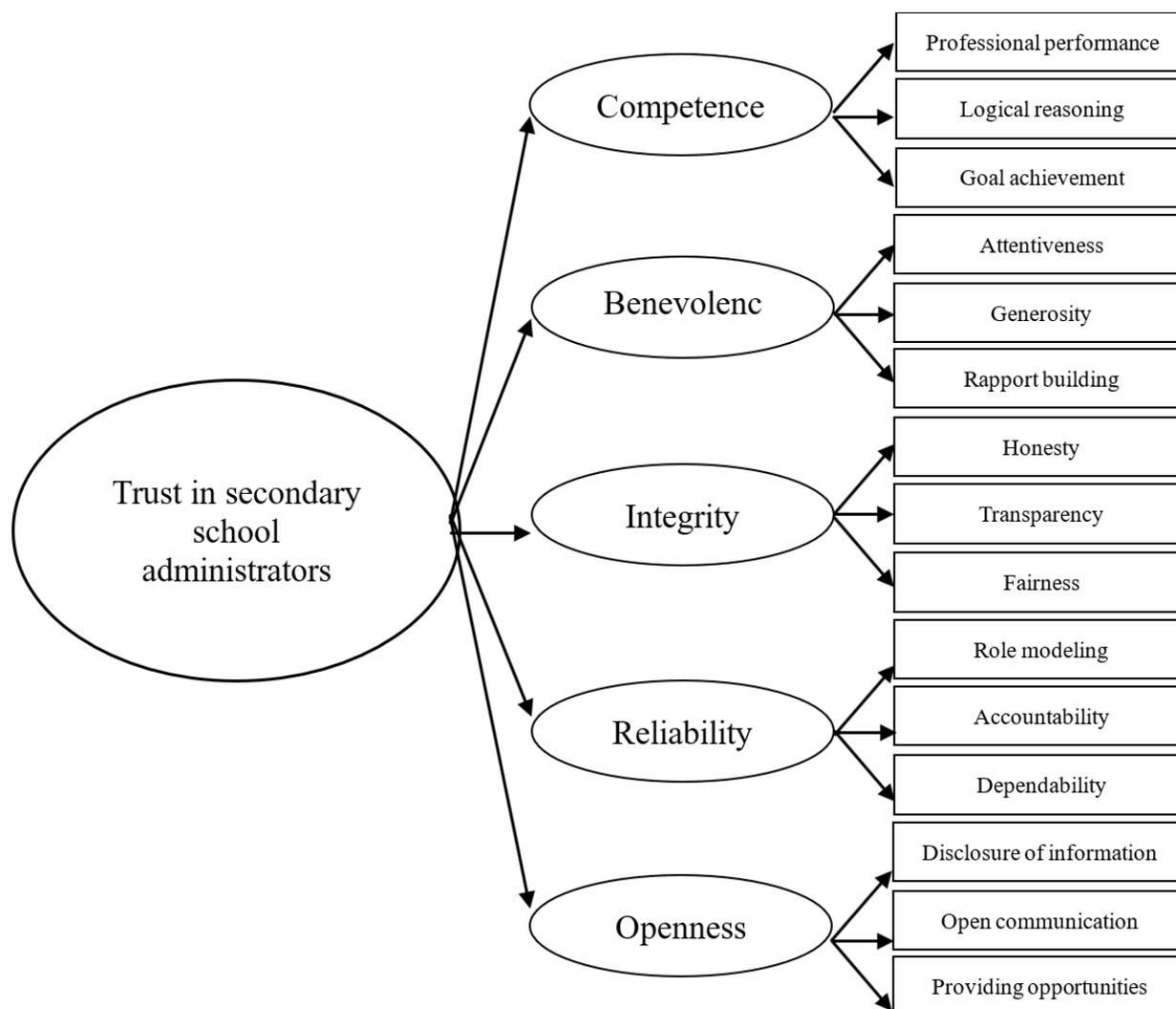


Figure 1.
Conceptual framework.

3. Methodology

Sampling and Sources of Data: For this study, the population includes all administrators and instructors in schools under the Office of the Basic Education Commission (OBEC) in Thailand's Northeastern province for the academic year 2024. The total comprises 933 schools and 45,725 individuals, including 2,460 administrators and 43,265 instructors.

This research sample comes from the above population, all school administrators and teachers in the Northeast region. The number of samples and the ratio of sample units to factor analysis parameters or variables are considered when determining sample size. As per Hair et al. [17], for factor analysis, the sample size should be no less than 50. Typically, researchers use a sample-to-variable ratio of 5:1 or 20:1, in other words, at least 100 participants. There are 20 parameters identified in this study, so a ratio of 20 to each parameter is set as desired for the total sample size of 400.

A multi-stage random sampling method was used to select the sample. The researcher used stratified random sampling based on secondary educational service area offices in the Northeast region. After that, simple random sampling was used to select one province from each educational service area

office, totaling 17 provinces. The size of each stratum was decided through quota sampling. Then, simple random sampling (drawing lots) was used to select school names.

This sample includes two administrators from each interviewed school, one director and one deputy director or department head, and two teachers, totaling four individuals per AO group. The study aims to enroll 400 data providers.

4. Design and Composition of the Study

A mixed-method design was chosen to study factors influencing the trust that schools in Northeast China place in their central administrators. This design aims to enable statistical analysis of the data and deductions about the target population.

A structured questionnaire via Google Form was employed by the researcher. To avoid social desirability bias, projective techniques were used. The items and response options on the survey were ordered from least to most applicable because everything had to be in Thai so respondents could understand it thoroughly.

The survey was distributed in the form of a questionnaire on popular online platforms to the target group. Respondents answered questions about the behavior and attitudes of their school administrators.

The questionnaire was divided into two parts, comprising 38 questions: Phase 1: Basic information about the respondent. This section collected data such as gender, rank, years of service in the rank, age group, and school size. It included multiple-choice questions. Phase 2: Perceptions of the Trust-Building Behavior Indicators of Central School Administrators in the Northeastern Region. This section was divided into five components, each forming a block called trust. It identified shortcomings and areas for improvement. A 5-point Likert scale measured respondents' opinions on several variables related to trust in central school management in the northeastern region.

5. Data Analysis

Phase 1: The data obtained from interviews will be analyzed using content analysis. This includes transcribing recorded material, processing expert opinions, compiling major points into a comprehensive table, and summarizing the expert interviews about the suitability of identified components and indicators of trust for secondary school administrators.

Phase 2: Data Analysis to Examine the Suitability of the Components and Indicators of the Trust Model for Secondary School Administrators in the Northeast. In the field of statistical computing, researchers will employ two phases to process their data. The first is for basic analytical values, and the second includes more complex analyses, such as chi-square analysis and regression. Process: This analysis will be carried out through the following steps:

1. Sample Analysis Preliminary: The purpose of this initial analysis is to gain a general understanding of the characteristics of those sampled.
2. High-quality data analysis to determine the appropriateness of components and indicators of trust. This step focuses on assessing whether the components and indicators of trust are suitable for secondary school administrators in the northeastern region where this study will be conducted.
3. Testing the Assumptions of Factor Analysis: The researcher will run tests to ensure that the assumptions are met before carrying out factor analysis.
4. Confirmatory Factor Analysis (CFA): This statistical technique will be used to confirm the hypothesized factor structure of the trust model.

6. Results

Using a multi-phase design, this study employs a mixed-methods research approach. Its purpose is to identify the components and indicators of trust in administrators. To achieve this, we conducted a comprehensive literature review and consulted experts on the subject. These findings are then to be

validated in the northeastern region of Thailand using confirmatory factor analysis with secondary school administrators.

Findings on Components and Indicators of Trust in Secondary School Administrators

Based on a comprehensive literature review, the researcher synthesized five core components and fifteen indicators of trust in administrators as follows: Competence: Professional performance, logical reasoning, and goal achievement. Benevolence: Attentiveness, generosity, and rapport building. Integrity: Honesty, transparency, and fairness. Reliability: Role modeling, accountability, and dependability. Openness: Disclosure of information, open communication, and providing opportunities.

The researcher then took this trust framework to nine experts, who raised various objections. From the results of content analysis and opinion processing, all experts agreed that the synthesized components and indicators of trust were suitable.

The Status Survey for Teachers at Northeast Number Two Middle School: The general survey of respondents revealed that female respondents (266 individuals) were the main group. A large number of them, 147 people or 36%, had been in their current jobs for over 10 years, and they were between 30 and 40 years of age (175 people). The overwhelming majority of respondents were from medium-sized schools (163 individuals or 40.75%).

The paper conducted data analysis on questionnaire data to verify whether trust elements are satisfactory and consistent for the typical secondary school administrator in the Northeast: average value of all questions, standard deviation, and CV. Following Khonkan's [18] criteria for selecting indicators for model testing (mean ≥ 3.00 and coefficient of variation $\leq 20\%$), all indicators were found to be suitable and met the established criteria.

In the factor analysis test assumptions, or preliminary, the author tested the correlation coefficient of variables' values for tolerance and variance inflation factor first. A correlation coefficient analysis of trust in administration at secondary schools in the Northeast: The overall correlation coefficient between variables ranged from 0.426 to 0.721. Although $p < 0.01$, it is significant. This suggests that there is no problem of multicollinearity for the economic/managerial period in Northeastern and that all relationships remain linear. If variables are highly correlated such that they are almost the same variable, whether multicollinearity occurs then becomes a question of accuracy for predicting the variables. Ideally, a variable used just for prediction will have little or no correlation with each of the other variables in a study. The correlation coefficient between variables x and y , each ranging from 0.61 to 1, indicates that the two variables are virtually. To establish suitable data for subsequent analysis, these results are perfect.

Multicollinearity Test (Tolerance and VIF): A further check was made on multicollinearity by examining (1) values for tolerance, which measure the portion of variance in an independent variable not explained by other independent variables, and (2) values for variance inflation factor (VIF), which are reciprocals of values. Acceptable data must satisfy certain conditions of tolerance and VIF judged against the 0.10 threshold, as used by Pusieon [19] and Thaksino [20]. Multicollinearity test results showed that every tolerance value ranged from 0.480 to 0.617, passing the tolerance criteria of ≥ 0.10 , and all VIF values were less than 10, indicating no multicollinearity. This data suggests that multicollinearity is absent from the data, and all relationships remain linear, which is the prescribed condition for factor analysis.

Goodness-of-Fit of the Model of Trust Components and Indicators for Northeastern Secondary School Administrators: Meets with Acceptable Criteria According to goodness-of-fit indices for the model of components and indicators of trust in secondary school administrators for the Northeastern region, as follows: Chi-square (χ^2) of 72.887 with 57 degrees of freedom (df). Allowing the probability $p=0.0764$, indicating that there was no statistically significant difference among predetermined amplitudes theoretically, and such steps were arranged evenly through the voice. The relative chi-square ratio (χ^2/df) was 1.279, raising the question: Is this model appropriate as a basis of measurement? The Root Mean Square Error of Approximation (RMSEA) was 0.026, showing a good fit for the measurement model. The Standardized Root Mean Square Residual (SRMR) was 0.008,

indicating a good fit for the measurement model. The Comparative Fit Index (CFI) was 0.998, demonstrating a good fit for the measurement model. All fit indexes in the table were thus found to be excellent. In conclusion, the model developed by the researcher shows strong goodness-of-fit with empirical data, as summarized in Table 1.

Table 1.

Goodness-of-Fit Indices of the Model of Trust Components and Indicators for Secondary School Administrators in Thailand's Northeastern Region.

Goodness-of-Fit Index	Criteria	Analysis Result
χ^2 - Test	$P > 0.05$	$\chi^2 = 72.887$ df = 57 P-Value = 0.0764
χ^2/df	< 2.00	1.279
RMSEA	≤ 0.03	0.026
SRMR	≤ 0.08	0.008
CFI	≥ 0.95	0.998
TLI	≥ 0.95	0.997

The factor loadings for the model of components and indicators of trust in secondary school administrators in Thailand's Northeastern regions ranged from 0.927 to 0.995. The component with the highest standardized factor loading was Reliability (RE), with a factor loading of 0.995 and an R-squared (R²) value well over 0.990. Openness (OP) had a factor loading of 0.976 and an R-squared (R²) value of more than 0.953. Competence (CO) had a factor loading of 0.927 and an R-squared (R²) value of 0.860, the lowest for any component as well. These results are summarized in Table 2.

Table 2.

Factor Loadings of the Model of Trust Components and Indicators for Secondary School Administrators in Thailand's Northeastern Region.

Component	Factor Loading			Factor Score Coefficient (FS)	Regression Coefficient (R ²)
	β	S.E.	t		
1. Competence	0.927	0.018	48.805	0.016	0.860
2. Benevolence	0.948	0.013	69.115	0.010	0.899
3. Integrity	0.968	0.011	85.369	0.005	0.936
4. Reliability	0.995	0.010	102.254	0.009	0.990
5. Openness	0.976	0.013	73.114	0.015	0.953

This study is based on empirical research findings and focuses on the theoretical reasoning of how to link a trust model for secondary school administrators in Thailand's Northeastern region. By ranking the components according to their factor loadings, we can derive a trust model for secondary school administrators in the Northeastern region: reliability, openness, integrity, benevolence, and competence. After presenting the factor loadings for each component of the trust model, the author will now present the factor loadings for each indicator within these components.

1) Competence (CO): The indicator with the highest standardized factor loading is Logical Reasoning (CO2), with a factor loading of 0.672 and an R-squared (R²) value of 0.880.

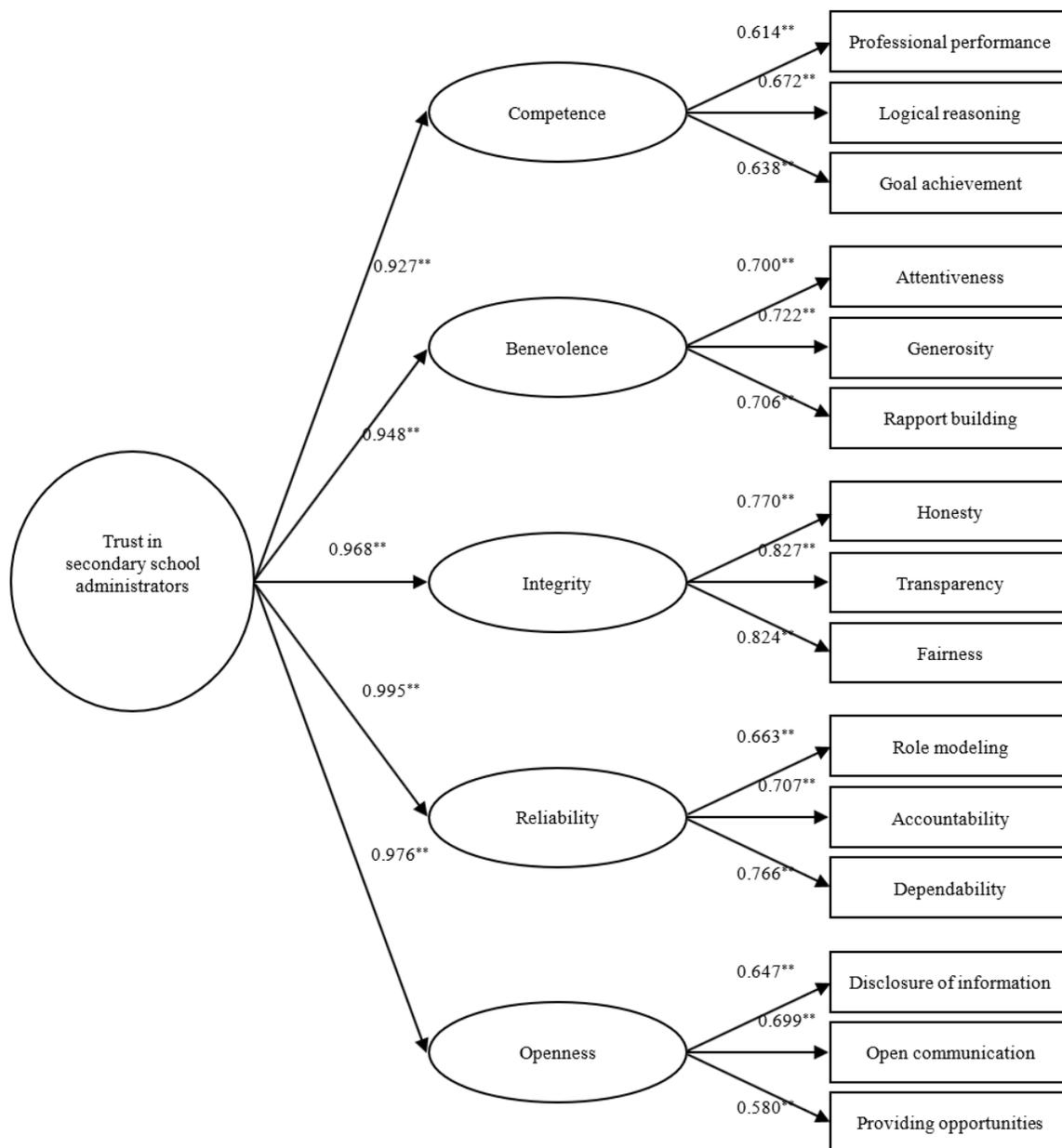
2) Benevolence (BE): The indicator with the highest standardized factor loading is Mutual Generosity (BE2), with a factor loading of 0.722 and an R-squared (R²) value of 0.930.

3) Integrity (IN): The indicator with the highest standardized factor loading is Transparency (IN2), with a factor loading of 0.827 and an R-squared (R²) value of 0.843.

4) Reliability (RE): The indicator with the highest standardized factor loading is Dependability (RE3), with a factor loading of 0.766 and an R-squared (R²) value of 0.863.

5) Openness (OP): The indicator with the highest standardized factor loading is Open Communication (OP2), with a factor loading of 0.699 and an R-squared (R²) value of 0.871.

This research conducted a goodness-of-fit analysis of the trust components and indicator model for high school administrators in the Northeast region of Thailand, and its empirical data, Figure 2: An analysis of the goodness-of-fit of a latent variable model for trust components and indicators among secondary school administrators in the Northeastern region of Thailand.



$\chi^2 = 72.887$, $df = 57$, P-Value = 0.0764, RMSEA = 0.026, SRMR = 0.008, CFI = 0.998, TLI = 0.997

Figure 2.

An analysis of the goodness-of-fit of a latent variable model for trust components and indicators among secondary school administrators in the Northeastern region of Thailand.

7. Discussion

The investigation determined that there were five primary components and fifteen distinct areas of trustworthiness concerning school administrators, each with its specific indicator: Competence: Professional Performance, Logical Reasoning, and Goal Achievement. Benevolence: Attentiveness, Generosity, and Rapport Building. Integrity: Honesty, Transparency, and Fairness. Reliability: Role Modeling, Accountability, and Dependability. Openness: Disclosure of Information, Open Communication, and Providing Opportunities. Tennenbaum [21] found that principals who deliver on promises do so in their work and become the touchstone for teachers, solving the keys to interactions with them. As far as their behaviors go, they must be virtuous, competent, honest, and reliable in performance. Such measures bring, to some extent, confidence and reliance among secondary school teachers in the decisions, support, and communication of their headmaster, three vital factors for creating mutually long-lasting trust between a principal and those under him or her, whoever they may be, regardless of whether he is white or black, old, young, or middle-aged.

The model for the components and indicators of trust in secondary school administrators in Thailand's Northeast region was tested against empirical data; it was found that the following factors do indeed have a significant impact on trust in one's school administrator: Competence, Benevolence, Integrity, Reliability, and Openness.

The model testing results for the components and indicators of trust in secondary school administrators in the Northeast region were satisfactory. Specifically, statistics were as follows: $\chi^2 = 72.887$, $df = 57$, $\chi^2/df = 1.279$, $p\text{-value} = 0.0764$, $CFI = 0.998$, $TLI = 0.997$, $RMSEA = 0.026$, $SRMR = 0.008$.

8. Conclusions

In conclusion, this model, when applied to the empirical data in the Northeast region, demonstrates a very good level of goodness of fit and trust in secondary school administrators as well. This model affords us insight into the structure of trust among secondary school administrators. Also, it can be used as a standard guide for adopting management methods in educational facilities, particularly in enhancing and maintaining sustainable trust among school administrators, teachers, and staff. It is worth noting that a teacher's trust in the school principal does not fall from the sky; it is not a matter of mere chance. Instead, this sort of trust comes about because of management practices marked by authoritativeness, consistency, openness, kindness, and integrity [22].

Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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