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Development of Information Ethics Model for Elementary School Administrators

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Abstract

In this study, the researchers aimed to identify and examine the key factors and indicators of information ethics for elementary school administrators under the administration of the Office of Primary Educational Service Area in Thailand. A mixed-mode research design was employed. The researchers conceptualized information ethics factors and indicators by analyzing documents and related past studies, followed by a survey of 840 respondents with the purpose of testing the goodness-of-fit of the identified information ethics factors and indicators with the empirical data. The results from the first phase indicate that there was a total of 16 indicators derived from the five factors in an information ethics model. The measurement model of information ethics factors and indicators were found to be parallel to the empirical data, with $\chi 2 = 47.221$, $df = 33$, $\chi 2/df = 1.430$, p-value = 0.0518, RMSEA = 0.023, SRMR = 0.016, CFI = 0.999, TLI = 0.996.

Keywords: *Access to Information; Elementary School Administrators; Information Ethics Model; Information Accuracy; Information Security.*

Introduction

Information ethics has become the responsibility of elementary school administrators involves ensuring the well-being, safety, and educational development of students, as well as maintaining a supportive and inclusive learning environment (Han, 2022).

Therefore, information ethics is crucial for educational administration for several reasons, namely, student privacy protection, trust and parental confidence, legal and regulatory compliance, cybersecurity and data protection, ethical use of technology, digital citizenship education, equity and access, and ethical decision-making (Han & Kim, 2021).

This is because elementary schools collect and store a significant amount of student data, including personal, academic, and health information. Information ethics of elementary school administrators are to ensure that the student data are handled responsibly and kept confidential, protecting the privacy and dignity of students (Han & Kim, 2021).

Kiral (2021) emphasized the importance of elementary school administrators practicing ethical

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values such as being fair, behaving equally, being respectful, being impartial, not discriminating, and acting in accordance with the legislation, and they should manage their institutions according to these determined ethical codes. Information ethics of elementary school administrators can build trust and confidence among parents by demonstrating that the elementary school administration values the privacy and security of their children's data (Kiral, 2021). Moreover, the information ethics of elementary school administrators encompasses measures to safeguard digital systems, networks, and databases, protecting sensitive student information from unauthorized access, identity theft, or other forms of cybercrime. Schools can create a safe, secure, and inclusive learning environment, foster trust among stakeholders, and prepare students to be responsible and ethical digital citizens by prioritizing information ethics in elementary educational administration (Han, 2022).

According to Awad et al. (2022), the hypothesis model of information ethics for elementary school administrators consists of five factors, namely information privacy, information accuracy, information property, access to information, and information security. Information privacy in this study means an elementary school administrator's right to control the collection, use, and dissemination of their personal information.

It involves the ability to keep personal data confidential and to limit access to it. In other words, information privacy encompasses various aspects, including the collection, storage, sharing, and protection of personal data. Information accuracy is defined as the correctness, truthfulness, and reliability of the information presented or communicated. It relates to the extent to which information reflects the reality or facts it claims to represent. Following this line of reasoning, information accuracy is an important factor of information quality and is essential for elementary school administrators to make informed decisions, conduct school-based research, and maintain the integrity of information (Han & Kim, 2021).

Information property in this study refers to the legal and ethical rights and protections associated with intellectual property, particularly focusing on information-based assets. It encompasses the ownership control, and rights of individuals over information that they have created, developed, or acquired (Zech, 2015).

Access to information means the ability of individuals to obtain, receive, and use information freely and without unnecessary barriers or restrictions. Therefore, access to information is a fundamental right that enables individuals to seek, receive, and impart information, empowering them to make informed decisions, participate in democratic processes, and exercise their rights and freedoms (Han, 2022).

The final factor of information ethics is information security. Information security is defined as the protection of information from unauthorized access, use, disclosure, disruption, modification, or destruction. Following this line of reasoning, information security involves implementing a range of measures, policies, and practices to safeguard information and the systems that store, process,

and transmit it (Joshi & Singh, 2017). The research gap in information ethics in elementary school administration in Thailand found that Thai researchers have not explored and studied information ethics sufficiently. This indicates the need for the current study to better understand and address the ethical considerations related to information management and use in elementary school settings. Following this line of reasoning, the main aim of this study was to identify the key factors and indicators with regard to information ethics and test the goodness-of-fit of the information ethics factors and indicators with the empirical data.

Materials and Methods

Research design

A mixed-mode research design by integrating document analysis and surveys allowed the researchers to benefit from the strengths of both qualitative and quantitative approaches, leading to a more comprehensive and grounded understanding of information ethics factors and their relationships (Creswell & Plano Clark, 2011). In the first phase of this study, the researchers conducted a thorough document analysis to analyze relevant literature, reports, policies, and other documents to identify existing theories, frameworks, and key factors associated with information ethics. This document analysis would help the researchers develop a theoretical foundation for the information ethics model (Morgan, 2022). The researchers screened and selected relevant documents to determine their relevance to their first research objective, namely the identification of information ethics factors and indicators. Subsequently, the researchers obtained the full text of potentially relevant documents for a more thorough evaluation (Morgan, 2022).

In the second phase, a survey research design was a methodological approach used by the researchers to gather data from a sample of administrators and teachers in elementary schools under the Office of the Basic Education Commission through the administration of a survey questionnaire (Gay et al., 2009). The researchers employed online surveys to ensure appropriate data collection procedures were followed to maintain data quality and minimize biases. The key strength associated with using surveys is to enable standardization of data collection, ensuring that all respondents received the same set of questions and response options.

This consistency allows for easier comparison and analysis of data across administrators and teachers for researchers to test the structural construction between experimental examination and the hypothetical theory of quantitative relationships concerning experimental data. The relationships were represented by path coefficients or deterioration between the information ethics factors and their indicators (Lavrakas, 2008).

Population and Sampling

The researchers employed a multi-stage sampling technique to select samples for the second phase from the population of all primary schools under the administration of the Office of Primary Educational Service Area in Thailand. This sampling technique was used because the population is

large and geographically dispersed (Hair et al., 2013). The multi-stage sampling involves dividing the population into smaller clusters, selecting a sample from each cluster, and then selecting a sample from within each selected cluster using Yamane's (1970) formula at a 95% confidence interval. Firstly, the researchers divided the population into four regions, namely north, central, northeast, and south, typically based on geographical and administrative boundaries. Secondly, a subset of clusters was randomly selected from the population, that was a province. The number of clusters selected depended on the desired sample size and the sampling method chosen was a simple random sampling technique. Thirdly, systematic sampling was employed within each selected cluster depending on the school size within each selected cluster. The number of samples within each cluster was proportional to the cluster size, depending on the school size. The research population at the final stage was comprised of school administrators and teachers from 13 provinces, as elucidated in Table 1. All the elementary schools are located in the 13 provinces under the supervision of the Basic Education Commission in Thailand. The researchers employed Becker and Ismail's (2016) rule of thumb to formulate an adequate sample size (N). The identified sample size was recognized as the presence of classified practice in reaching an adequate probability for the requisite results such as model convergence, statistical precision, and statistical power for particular confirmatory factor analysis (CFA) with empirical data. This was followed by determining the ratio of parameters and samples as 20:1 to fulfill the sample size criteria (Hair et al., 2013). Owing to there were 21 parameters in this research that directed to at least 420 as the required sample size. Since the sub-groups were school administrators and teachers, the researchers selected one school administrator and one teacher from 420 schools, making up a total of 840 samples. The survey was steered to evaluate the factors and indicators of the information ethics model. Table 1 illustrates the distribution of the population and sample group.

Table 1. Distribution of population and sample groups

First Stage		Second Stage				Total
Region	Province	Small	Medium	Large	Extra Large	Samples
North	Chiang Mai	12	12	4	4	64
	Chiang Rai	12	12	4	4	64
	Lamphun	12	12	4	4	64
Central	Nakhon Sawan	12	12	4	4	64
	Lopburi	12	12	4	4	64
	Nakhon Pathom	12	12	4	4	64
Northeast	Kalasin	12	12	4	4	64
	Khon Kaen	12	12	5	5	68
	Nakhon Ratchasima	12	12	5	5	68
	Maha Sarakham	12	12	4	4	64
South	Phatthalung	12	12	4	4	64
	Songkhla	12	12	4	4	64
	Nakhon Si Thammarat	12	12	4	4	64
Total	13	156	156	54	54	840

Research procedures

The researchers started their study by determining the factors and indicators of information ethics as a specific focus of their document analysis. This was followed by gathering relevant documents such as academic papers, research articles, industry standards, codes of conduct, organizational policies, legal framework, and professional guidelines in order to address the subject of information ethics within their chosen scope. Then, the researchers read each document, highlighted, and annotated relevant sections. They paid attention to the key factors and indicators that were explicitly mentioned or implicitly implied within the text. After the researchers analyzed the annotated documents, they identified themes or recurring elements related to information ethics. Besides, the researchers looked for patterns, concepts, principles, and practices that emerged across multiple documents. These themes provided insights into factors and indicators of information ethics. After the first phase, the researchers conducted a survey mainly to investigate the relationships between variables and test the theoretical information ethics model. The second phase was applied to identify factors and indicators of information ethics derived from the document analysis in the first phase. The researchers conceptualized the model by developing a theoretical framework that represents the factors and indicators of information ethics. This framework should be based on the existing literature from the first phase. Then, the researchers defined the latent constructs (factors) and their corresponding observed indicators (refer to Figure 1). Quantitative data on the variables included in the model were collected using a questionnaire in order to capture information related to information ethics. This was to ensure that the data collected would be aligned with the identified factors and indicators. Then, the researchers constructed a measurement model that specifies the relationships between the latent constructs and their observed indicators. This step was used to ensure the selected indicators adequately measure their corresponding factors. Once the measurement model was established, the researchers specified the relationships between the latent constructs. In other words, the researchers determined the relationships between the factors based on the theoretical framework. The structural model represents the causal relationships between the factors of information ethics (Hair et al., 2013).

Research Instrument and Data Analysis

Field notes were the research instruments for document analysis to determine the factors and indicators of information ethics. The researchers began each field note by recording essential details about the documents the researchers were analyzing. The document details include information such as the title, author, date, source, and any relevant contextual information. This helps in identifying and referencing the document later (Gay et al., 2009). The researchers summarized the content of the field notes to provide an overview of the document's content. The researchers identified the main themes, arguments, or ideas that related to information ethics presented in the documents. This was followed by noting any key findings, evidence, or examples that support the document's central message (Gay et al., 2009). In the second phase, a questionnaire that includes a total of 50 closed items as a research instrument to collect quantitative data. The closed items

were clear, concise, and appropriately worded to elicit the desired information that fit into five pre-determined factors and 16 indicators from the results of the first phase. A continuous five-choice Likert scale was used to assess 840 respondents' perceptions of information ethics practice. There were six sections with a total of 50 items consisting of seven items about demographic information and 43 items about five factors of information ethics. Section A collects basic demographic data about the respondents, namely age, gender, educational level, position, working experience, school size, and school location. The demographic information helps the researchers understand the characteristics of the sample population and analyze how different factors might influence their response. This is followed by Section B to Section F which was particularly designed by the researchers to obtain data about the information privacy (PR) factor, information accuracy (AC) factor, information property (PP), access to information (AI), and information security (SE) factor, respectively. The contents of the questionnaire from Section B to Section F are as follows: Section B consists of three PR indicators (19 items), namely protection of personal data (PR1), data collection (PR2), and data use and disclosure (PR3) with 9 items, 7 items, and 3 items, respectively. Section C consists of three AC indicators (3 items), namely correctness verifying (AC1), updating information process (AC2), and information reliability (AC3). Section D consists of three PP indicators (7 items), namely plagiarism (PP1), copyright information (PP2), and software licenses (PP3) with 1 item, 2 items, and 4 items, respectively. Section E is comprised of three AI indicators (5 items), namely access control (AI1), authorization (AI2), and authentication (AI3) with 1 item, 2 items, and 2 items respectively. Section F is comprised of four SE indicators (9 items), namely confidentiality (SE1), responsibilities (SE2), integrity (SE3), and maintenance of information technology system (SE4) with 3 items, 2 items, 1 item, and 3 items, respectively. Content analysis was the methodology used to systematically analyze and interpret qualitative data, that was text documents obtained from the first phase to identify patterns, themes, and relationships within the data (Kibiswa, 2019). Firstly, the researchers developed a coding scheme, which was a set of codes that captured different aspects of the content within the documents. The coding scheme should be aligned with the research objective and provide a systematic framework for analyzing the qualitative data. Codes could be predetermined (priori codes) or emerge during the analysis (emergent codes). Secondly, the researchers read and examined each document, systematically applying the coding scheme to identify and assign relevant codes to specific sections, passages, or themes within the text. This process involved systematically categorizing the content based on the coding scheme. Finally, the researchers organized and analyzed the coded data. This could involve creating tables to display the distribution of codes across documents or comparing codes within and across different documents (Kibiswa, 2019). The researchers employed structural equation modeling (SEM) to analyze quantitative data for developing an information ethics model. The use of SEM software was to estimate the parameters of the information ethics model based on the collected data. The estimation process involved iterative calculations to find the best-fitting model that minimized the discrepancy between the observed data and the model's implied covariance structure (Hair et al., 2013). Then, the researchers assessed model fit by evaluating the goodness-

of-fit of the estimated model. The goodness-of-fit of the estimated model was examined using various fit indices such as the chi-square test, Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA). These common fit indices indicate how well the model fits the data and whether the model is acceptable (Hair et al., 2013).

Results and Discussion

Identification of Information Ethics Factors and Indicators

The initial results of document analysis revealed that there are five factors of information ethics: (i) information privacy; (ii) information accuracy; (iii) information property; (iv) access to information, and (v) information security. On top of that, the document analysis results indicated that there are 16 indicators of derived from the five factors with regard to fitting the Thai context. The results of the document analysis are demonstrated in Figure 1 below.

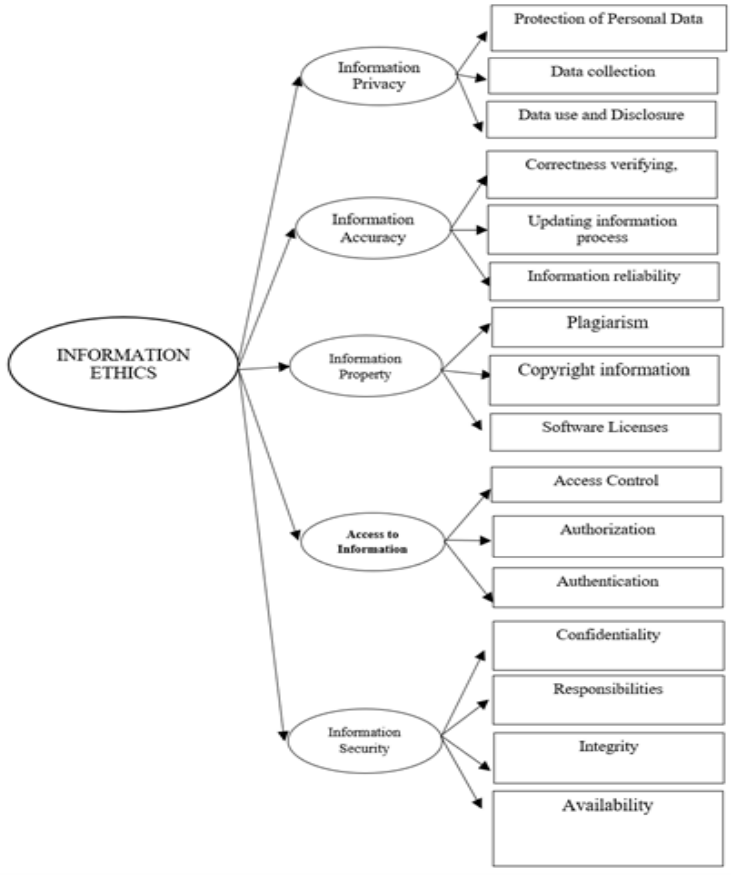

Figure 1. The factors and indicators of information ethics

After the researchers discussed with the experts in educational measurement and evaluation, they suggested determining a cut-off point as a mean score of more than 3.00 and less than 20 percent as the coefficient of scattering (CV), to create those indicators on the foundation of previous studies related to the information ethics. The results showed that all the factors and indicators of information ethics are fulfilling the conditions because the mean scores are more than 3.00 and CV values are less than 20%. If we arranged the factors of information ethics showed that the highest mean score was information privacy ($\bar{x}$ = 4.51; *SD* = 0.29). This was followed by information accuracy ($\bar{x}$ = 4.49; *SD* = 0.29), information property ($\bar{x}$ = 4.49; *SD* = 0.29), and access to information ($\bar{x}$ = 4.20; *SD* = 0.38), in that order. The information security was found to be the least capacity ($\bar{x}$ = 4.00; *SD* = 0.29), as shown in Table 2.

Table 2. Identification of factors and their indicators of information ethics

Factors	Indicators	Mean	Std. Dev	CV
Information privacy (PR)	Protection of personal data (PR1)	4.51	0.30	0.09
	Data collection (PR2)	4.51	0.29	0.09
	Data use and disclosure (PR3)	4.51	0.29	0.09
	Overall	4.51	0.29	0.09
Information accuracy (AC)	Correctness verifying (AC1)	4.49	0.29	0.08
	Updating information process (AC2)	4.50	0.29	0.08
	Information reliability (AC3)	4.49	0.29	0.08
	Overall	4.49	0.29	0.08
Information property (PP)	Plagiarism (PP1)	4.49	0.28	0.08
	Copyright information (PP2)	4.51	0.29	0.08
	Software licenses (PP3)	4.49	0.29	0.09
	Overall	4.49	0.29	0.08
Access to information (AI)	Access control (AI1)	4.19	0.38	0.15
	Authorization (AI2)	4.20	0.37	0.14
	Authentication (AI3)	4.23	0.38	0.14
	Overall	4.20	0.38	0.14
Information security (SE)	Confidentiality (SE1)	4.00	0.28	0.08
	Responsibilities (SE2)	4.01	0.30	0.09
	Integrity (SE3)	4.00	0.29	0.08
	Maintenance of information technology system (SE4)	4.00	0.29	0.08
	Overall	4.00	0.29	0.08
	Summary	4.33	0.30	0.09

The researchers developed an information ethics model that represents the identified factors and indicators by arranging the factors and indicators in a logical manner that reflects their interrelationships. Thus, this model would provide a comprehensive and structured overview of the ethical considerations relevant to information ethics within the researchers' chosen scope. The results of Pearson correlation coefficients were used to measure the linear relationships between pairs of 16 indicators. Table 3 demonstrates the results of intercorrelation between the indicators of information ethics showing that there are positive correlations for all relationships between pairs

of 16 indicators. This means that as one indicator increases, the other tends to increase too. Moreover, the magnitude of the correlation coefficients ranged from 0.340 to 0.873 indicating the strengths of the relationship from moderate to strong, with values closer to 1 representing a stronger correlation and all the relationships are statistically significant at 0.01 level. The relationship between the integrity indicator and maintenance of information technology security system indicator (r = .873; r<.01) was found to be the highest magnitude of the correlation coefficient. On the other hand, the weakest magnitude of the correlation coefficient was the protection of personal data indicator with authorization indicator (r = .385, p<.01), as elucidated in Table 3.

Table 3. Intercorrelations results of identifying indicators of information ethics

	PR1	PR2	PR3	AC1	AC2	AC3	PP1	PP2	PP3	AI1	AI2	AI3	SE1	SE2	SE3	SE4
PR1	1															
PR2	.650**	1														
PR3	.670**	.747**	1													
AC1	.674**	.738**	.725**	1												
AC2	.647**	681**	.681**	.760**	1											
AC3	.697**	.680**	.625**	.740**	.773**	1										
PP1	.456**	.623**	.528**	.496**	.496**	.494**	1									
PP2	.559**	.665**	.539**	.638**	.641**	.649**	.626**	1								
PP3	.588**	.647**	.535**	.608**	.647**	.661**	.620**	.699**	1							
AI1	.452**	.426**	.451**	.410**	.375**	.368**	.340**	.379**	.580**	1						
AI2	.385**	.524**	.588**	.540**	.502**	.414**	.355**	.416**	.589**	.582**	1					
AI3	.455**	.471**	.532**	.488**	.474**	.485**	.328**	.445**	.633**	.579**	.831**	1				
SE1	.524**	.607**	.553**	.614**	.556**	.542**	.527**	.634**	.666**	.531**	.688**	.745**	1			
SE2	.563**	.670**	.518**	.598**	.507**	.578**	.612**	.619**	.713**	.519**	.473**	.572**	.805**	1		

Table Continues:

SE3	.531**	.539**	.453**	.426**	.426**	.451**	.459**	.486**	.633**	.526**	.516**	.636**	.775**	.820**	1
SE4	.503**	.504**	.486**	.469**	.455**	.390**	.435**	.469**	.665**	.506**	.639**	.712**	.793**	.724**	.873**	1

**Correlation coefficient is significant at the 0.01 level (2-tailed)

The Goodness of Fit of the Information Ethics Factors and Indicators With Empirical Data

The researcher sought to obtain estimates of the parameters of the information ethics model by validating the identified factors and their factor loading. Factor loading in the context of Confirmatory Factor Analysis (CFA) was used to analyze the standardized regression coefficients that represent the strength and direction of the relationships between observed variables (indicators) and latent factors. Therefore, CFA was used by researchers to assess the information ethics model and test the construct validity of a theoretical model. The factor loadings indicate how much of the variation in each observed variable is explained by the corresponding latent factor. As a result, the higher magnitude of a factor loading indicates a stronger relationship between the latent factor and observed variable as the magnitude of a factor loading ranges from 0 to 1. The co-variance with the information ethics factors ranged from 50.70 to 96.20 percent. The factor with the highest factor loading value is information privacy (PR). This is followed by information accuracy (AC), information property (PP), and information security (SE). The factor that has the least capacity for factor loading value is access to information (AI). Therefore, the researchers concluded that all the key factors are important constructs of information ethics for elementary school administrators. The researchers looked for values above a certain threshold, such as 0.3, to assess the significance of factor loading. Table 4 illustrates the results of CFA for key factors of information ethics.

Table 4. The results of CFA for key factors of information ethics

Factors	**β**	**SE**	**t**	**R^2**
Information privacy (PR)	0.975	0.010	97.783	0.671
Information accuracy (AC)	0.922	0.010	92.664	0.667
Information property (PP)	0.914	0.024	41.221	0.962
Access to information (AI)	0.742	0.027	31.481	0.781
Information security (SE)	0.824	0.016	54.361	0.507

Furthermore, results of the co-variance with the information ethics indicators are found in the range of 60.10 to 93.50 percent. As shown in Table 5, the factor loading of all the information ethics indicators ranges from 0.694 to 0.942 and is statistically significant at 0.01. Therefore, the researchers concluded that all the identified indicators are considered essential constructs for the information ethics model.

Table 5. The results of CFA for indicators of information ethics

Indicators	β	SE	t	R^2	Coefficient of Score Components FS
Information privacy (PR)					
Protection of personal data (PR1)	0.741	0.018	41.166	0.612	0.113
Data collection (PR2)	0.867	0.011	79.929	0.768	0.254
Data use and disclosure (PR3)	0.868	0.012	75.503	0.695	0.279
Information accuracy (AC)					
Correctness verifying (AC1)	0.857	0.011	78.919	0.764	0.161
Updating information process (AC2)	0.879	0.010	88.794	0.765	0.181
Information reliability (AC3)	0.866	0.010	87.893	0.768	0.102
Information property (PP)					
Plagiarism (PP1)	0.696	0.019	54.792	0.623	0.292
Copyright information (PP2)	0.874	0.017	53.144	0.678	0.175
Software licenses (PP3)	0.893	0.015	60.016	0.745	0.087
Access to information (AI)					
Access control (AI1)	0.694	0.025	28.761	0.601	0.381
Authorization (AI2)	0.915	0.029	33.551	0.822	0.103
Authentication (AI3)	0.826	0.024	36.438	0.731	0.270
Information security (SE)					
Confidentiality (SE1)	0.853	0.012	71.451	0.786	0.066
Responsibilities (SE2)	0.942	0.011	86.565	0.935	0.590
Integrity (SE3)	0.763	0.018	44.388	0.811	0.264
Maintenance of information technology system (SE4)	0.753	0.017	43.294	0.796	0.448

The researchers considered several fit indices of SEM to evaluate the goodness of fit in this information ethics model to establish whether, overall, the model is acceptable. As a result, the researchers would typically compare the obtained values to commonly accepted threshold values to interpret the fit indices. Some widely used fit indices include the Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR) were used to provide information on how well the model fits the data, the degree of model misspecification, and the amount of unexplained variance. The researchers took into account the following criterion for acceptance threshold values to interpret the fit indices. Firstly, CFI and TLI values greater than 0.90 or 0.95 indicate a reasonably good model fit (Diamantopoulos & Siguaw, 2000). Secondly, RMSEA values below 0.08 or 0.06 suggest an acceptable fit (Hu & Bentler, 1999). Finally, SRMR values below 0.08 are often considered indicative of a good fit (Byrne, 1998; Diamantopoulos & Siguaw, 2000). The quantitative result showed that the information ethics model has a goodness of fit with the obtained data of $\chi^2 = 47.221$, df = 33, $\chi^2/df = 1.430$, *p*-value = 0.0518, RMSEA = 0.023, SRMR = 0.016, CFI = 0.999, TLI = 0.996. Even though the chi-square (χ^2) is the standard statistic to assess the overall fit of the model to the data, it is practically impossible not to reject the null hypothesis while large samples were used, according to Jöreskog and Sörbom (1993). Therefore, the researchers

concluded that the information ethics model agreed with the empirical data. Thus, the information ethics model was accepted, and the researchers could establish whether specific paths were significant as elucidated in Figure 2.

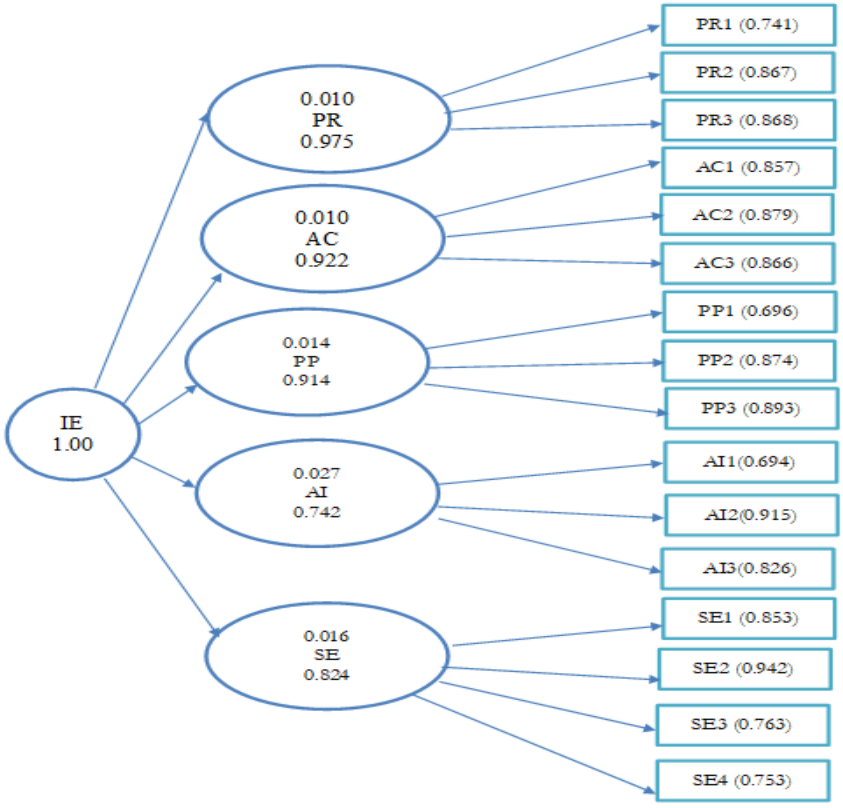

Figure 2. Information ethics model

Conclusion

The major result of this study is proposing and testing a model associating information ethics with its five key factors and 16 indicators. Since there is a scarcity of empirical studies on specific ethical issues and challenges related to information ethics in elementary school administration in Thailand, the information ethics model can assist elementary school administrators to explore the ethical implications of collecting, storing, and sharing student data in digital systems.

The qualitative results revealed that there are some key aspects of information ethics that elementary school administrators should take into consideration, namely information privacy, information accuracy, information property, access to information, and information security while they are practicing information ethics management. Besides, the quantitative results further confirmed that all the five key factors have strong, significant, and positive relationships with

information ethics practice, namely information privacy, information accuracy, and information property. Information property (R^2 = 96.2%) seemed to be the strongest factor contributing to information ethics practice. Information property rights allow elementary school administrators to benefit from their intellectual efforts, incentive innovation and creativity, and foster academic growth. Consequently, elementary schools can provide legal frameworks for protecting and enforcing these rights, allowing individuals and schools to control the use, distribution, and commercialization of their intellectual property. The second stronger factor is access to information (R^2 = 78.1%). This means that access to information plays an essential role in promoting democracy, human rights, education, economic development, and social progress. Therefore, elementary school administrators have a responsibility to ensure that information is freely accessible, promote digital inclusion, and foster information literacy to maximize the benefits of access to information for all individuals. The third stronger factor is information privacy (R^2 = 67.1%), this implies that information privacy is important as elementary school administrators must protect individuals from unauthorized use of their personal data, identity theft, financial fraud, and other privacy violations.

The researchers concluded that information privacy plays a crucial role in establishing trust between individuals and organizations, and it is supported by legal and regulatory frameworks in many jurisdictions around the world. The fourth stronger factor is the information accuracy factor (R^2 = 66.7%). This implies that elementary school administrators should ensure information accuracy. Information accuracy is crucial in various domains, including journalism, research, education, decision-making processes, and public disclosure. Accurate information empowers teachers to make informed choices, promotes trust in information sources, and contributes to the advancement of knowledge and understanding.

The results showed that the least capacity factor that influences information ethics is information security (R^2 = 50.7%). However, information security is important for protecting sensitive data, maintaining education continuity, preserving privacy, and preventing unauthorized access or misuse of information. Schools of all sizes and across various sectors prioritize information security to safeguard their assets, reputation, and the trust of their stakeholders. In conclusion, the information ethics model is tailored specifically for elementary school administrators' need for the development of ethical decision-making. Such a model could assist elementary school administrators in navigating complex ethical dilemmas related to student privacy, data security, digital citizenship, and responsible use of technology.

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