สถาบันวิทยาการจัดการแห่งแปซิฟิค
PACIFIC INSTITUTE OF MANAGEMENT SCIENCE

Developping 21st Century Leadership Skills Indicators for School Administrators in Anshan Normal

RECEIVED November 20, 2021
REVISE April 14, 2024
ACCEPTED April 19, 2024

Chen Yi, Peerapong Tipanark and Pornthep Muanman
Bangkokthonburi University
Email: 6263210044.edu@bkkthon.ac.th

Abstracts

The objectives of this research were: 1) To explore the factors and indicator of 21st century leadership skills for school administrators under Anshan Normal University, Liaoning province. 2) To modelling the 21st century leadership skills indicators for school administrators under Anshan Normal University, Liaoning province.The total population of this study included 1,142 administrator and teachers from Anshan Normal University in Liaoning, the People's Republic of China. A stratified random sampling method was used to sample, totaling 480 persons. The instrument for collecting data was a questionnaire. Descriptive statistics and the Confirmatory Factor Analysis were used to perform data analysis using statistical software. Research results revealed that 1) the factors in these studies screened from theoretical framework, it's consisted of 4 key factors and 13 indicators of 21st century leadership skills. The 4 key factors were: Communication Skills, Creative Skills, Vision Skills, and Cooperation Skills. 2) the developed model of 21 century leadership skills indicator for school administrators under Anshan Normal University is consistent with the empirical data, the value of Chi-square all in line with specified criteria. And the key factors had the weight between 0.84 - 0.9 higher than 0.70; sub-factors/ indicators between 0.70 - 0.92, higher than the criterion as 0.30. should encourage the adoption of this developed model. It was used as a guideline for developing leadership skills in the 21 century for school administrators at Anshan Normal University focus on key components, sub-components, and indicator levels, as the findings showed, because of the developed models were consistent with empirical data. By adopting the model as a development guide, the importance of the main elements should be taken into account. The research found that there are descending components weight values.

Keywords*:* Developing Model, 21 Century Leadership Sill Indicators, School administrators

Introduction

The current world situation is changing rapidly as a result of advances in science and technology which have affected China in many ways, be it politics, economy, education, society and culture. Both public and private agencies have to adjust their management or organizational structure in accordance with the changing conditions in order to stand and compete with countries around the world in conjunction with globalization. The industrial sector of China has stepped into a high-tech

system with a restructuring of the economy. To increase production potential to be able to compete with the international from this intense competition. Many countries have turned their attention to improving the quality of workers in government, business and industry. Therefore, the need for knowledgeable personnel, the ability and skill to properly and effectively use the control of production technology is therefore at a high level in such situations.

The management of education at present is the era of educational reform. in which the management in the educational institution can be effective; Administrators must have high leadership qualities. a new leader era of change in order to be able to adjust accordingly and keep up with the changes in the globalized world. The process by which administrators can influence to motivate, guide, and persuade personnel to act with the willingness, willingness and enthusiasm of accomplishing the school's goals is called "leadership". It is very important to carry out the activities of educational institutions to keep up with the progress and change of the world. as an indicator of competence in carrying out various activities in educational institutions, from the past to the present Leadership has become extremely important in school administration. to be able to manage effectively and has been researching for a long time until causing many concepts and theories about leadership and is consistent with the current situation that has changed in the field of competition, economic, social and political. Education for the 21st century ought to be infused with the ideals of the SDGs. Thus, leadership in educational institutions should demonstrate upward leadership to influence the state's policy, lateral leadership to ensure knowledge transfer through collaborations with other schools, and institutional leadership to ensure a supportive and warm environment for the staff (Munby, S.& Fullan M., (2020)

Anshan Normal University is a university in the city of Anshan, in Liaoning province. It is under the provincial government. Since its establishment for more than 50 years.With such importance, therefore, the researcher is interested in studying the indicators 21st century leadership skills for school administrators under Anshan Normal University, which is a study from theory to structural relationship modeling and to examine the coherence of the structural relational models developed from theory and research with empirical data. If the model is found to be consistent with the empirical data according to the specified criteria can use the research results to be used as information for planning and prioritizing in enhancing the quality of school administrators to have skills in management in the new era, or create criteria for assessing the administrators. In addition, educational institutions or related agencies can be used for monitoring, and evaluating the operation to see how effective and efficient as well.

Research objectives

1.To explore the factors and indicator of 21st century leadership skills for school administrators under Anshan Normal University, Liaoning province.

2.To modelling and evaluate the 21st century leadership skills indicators for school administrators under Anshan Normal University, Liaoning province.

Research Methodology

The research methodology was mixed method, including qualitative and quantitative research, studied with the respondent both administrators and teachers of the university totally 480 respondents. The research instruments used in the research are divided into two sections: 1) a questionnaire on the status of respondents, 2) a questionnaire on the suitability of leadership skills indicators in the 21 centuries for school administrators, using a 5-level rating scale classified by key and sub-components, there were a total of 72 questions.

Data analysis

The results of the data analysis presented in Chapter 4, the researchers discussed the symbols and letters used in the analysis of the data, and the results of the analysis of the health data of the sample that answered the inquiry. After that, the results of the data analysis are presented in the order of the objectives of the research defined. as follows

1.Symbols and abbreviations used in data analysis

2. Results of analysis of the demographic data of the respondents

3.The results of the data analysis to answer the research objectives

Presentation of data analysis results the researchers presented it in three parts as follow:

Results of the analysis of the suitability of the 21 century leading indicators for the administrators. The results of the analysis answer the objectives of research No. 1.

By finding the mean score (x), standard deviation (S.D.) and distribution coefficient (C.V.) in order to show the appropriateness of the indicator by compare with the criteria, the average or mean score threshold is equal to or greater than 3.00. and a distribution coefficient (C.V.) equal to or greater than 20%. This is to select and define such indicators in the structural relationship model. In the analysis of the accompanying acts. The next affirmative action the results of the analysis are separated into each of the main components. It shows that indicators of leadership skills in the 21 centuries for the administrators, it has mean score, standard deviation and distribution coefficient meet the criteria given by all indicators as follows:

The components of "Communication Skills", which consist of 3 indicators: media literacy, technology skills and presentation, have a total of 21 indicators. There's value in it. range 4.07 - 4.57 and distribution coefficient is between 12.13 – 16.92.

The components of "Creative Skills", which consist of 4 indicators: thought, originality, challenge, flexibility, and imagination, total 16 indicators, have a value between 4.28 – 4.52 and a distribution coefficient of 12.50 – 14.56.

The components of "Vision Skills", which consist of 3 indicators: thought, creating a vising, communicating the vision, and inspirational motivation, total 17 indicators, have a value between 4.28 – 4.52 and a distribution coefficient of 12.60 – 14.19

The components of 'Collaboration Skills", which consist of 3 indicators: participation, trust, and conflict resolution, total 18 indicators. There's value in it. Range 4.41 – 4.64 and the distribution coefficient is between 11.19 – 13.41.

Analysis of the confirmatory component model of the 21 century leadership skills indicators for the administrators in order to answer the objectives of research No. 2 by test the model at the

indicator level of each component developed from theory and research results with empirical data with the Second Order Confirmatory Analysis as shown in Figure 1

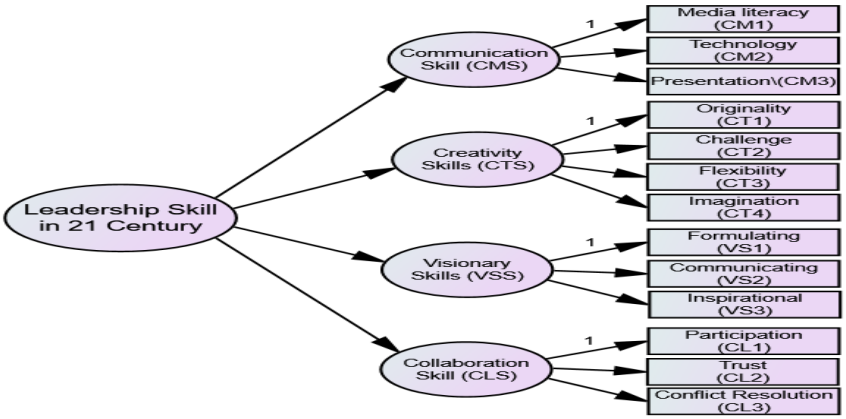

Figure 1 The second order consistency of the Confirmatory Analysis Model of the 21 century leadership skills indicators for the administrators from theoretical framework

Analysis at this stage to test the consistency of the 21 century leadership skills structural relationship model for brigands with empirical data by analysis the second order of the 13 observed variables which identified from the four constructed component scales is communication skills (CMS), creative skills (CTS), vision skills (VSS), and collaborative skills (CLS).

Before analysis of the second order of confirmatory analysis, researcher was studied the correlation between the 13 indicator scales to determine the appropriateness of the correlation matrix to be analyzed. The results of the analysis are shown in Table 1

Table 1 shows the Pearson Correlation Coefficient of the 21 century leadership skills indicators for the administrators

Indicators	CM1	CM2	CM3	CT1	CT2	CT3	CT4	VS1	VS2	VS3	CL1	CL2	CL3
CM1	1												
CM2	.605	1											
CM3	.614	.646	1										
CT1	.544	.495	.659	1									
CT2	.559	.456	.581	.644	1								
CT3	.580	.474	.606	.694	.731	1							
CT4	.504	.474	.611	.617	.668	.652	1						
VS1	.530	.481	.646	.576	.638	.637	.719	1					
VS2	.541	.463	.652	.546	.593	.596	.660	.795	1				
VS3	.514	.360	.559	.537	.542	.577	.595	.642	.733	1			
CL1	.462	.365	.529	.501	.513	.579	.576	.636	.695	.733	1		
CL2	.501	.357	.512	.557	.572	.612	.601	.622	.612	.703	.757	1	
CL3	.486	.342	.520	.548	.596	.615	.663	.643	.660	.688	.725	.768	1

Note: The correlation coefficients of the 13 independent variables are statistically significant at < .01.

From Table 1 above, the results of Pearson Correlation Coefficient analysis of the model. Indicators of leadership skills in the 21 centuries for the administrators. It was found that 13 observed variables or indicators were statistically significantly positively correlated at .01 (p< .01), with the highest correlated indicators of 1) Vision generation (VS1) and Vision Communication (VS2) have a correlation coefficient of 0.795, while the least correlated indicators are technology (CM2) and conflict resolution (CL3) with a correlation coefficient of 0.342. Overall, of this inter-correlation matrix not more than 0.80, Hair, J.F., et al (2010) and Poonpong Suksawang (2020). Report about rule of thumb the correlation ecoefficiency of this matter should be between 0.20-0.80, therefore it shows that there was no multicollinearity effect of the model in this study.

In addition, also further investigated whether these 13 observable variables or indicators were observed whether or not a correlation can be classified as a factor and whether it is appropriate, based on statistical values, namely the Bartlett test and the KMO or Kaiser-Mayer-Olkin Measurers of Sampling Adequacy: MSA. The analysis results as shown in Table 2 as follow

Table 2 The statistic of Bartlett and KMO index of 21 century leadership indicators skill for the school administrators in Anshan Normal University

List	Bartlett test of Sphericity	p	Kaiser-Mayer-Olkin Measurers of Sampling Adequacy (MSA)
The 21 century leadership indicators skill for the school administrators	6591.829	0.000	0.925

Table 2 shows that the matrix correlation between the variables analyzed is different from the identity matrix. Statistically significant at the level of 0.01 (p<. 01), the Bartlett test of Sphericity value is equal to 6591.829 and the KMO. value is 0.925, with a value greater than 0.80, which Kim, J. O., & Mueller, C. W. (1978). Have written in their book on title “Factor Analysis: Statistical Methods and Practical Issues (Quantitative Applications in the Social Sciences) that the KMO will be examines the suitability of a sample to develop the model. The value of the KMO should be greater than 0.5 and for Bartlett's Test, it examines the population correlation matrix as an identity matrix, which is determined by its statistical significance to be less than 0.05 (p<.05). Therefore, the results of this preliminary analysis of the data for verification before develop the model with CFA. (Confirmative Factor Analysis) were considered to be very good.

The researchers then performed a second order of confirmative factor analysis with the AMOS program to develop a 21-century leadership skills indicator for the administrator, as shown in figure 2 and Table 2

The figure 2 and Table 3, researcher was shown, it's were the results of the 21 century leadership indicators for the school administrators of Anshan Normal University model by testing of the hypothesis model existent with the empirical data.

The results of this analysis are the final results (Second Order of CFA.) in which the model had modified according to statistical methods until it is consistent in accordance with the established assumptions.

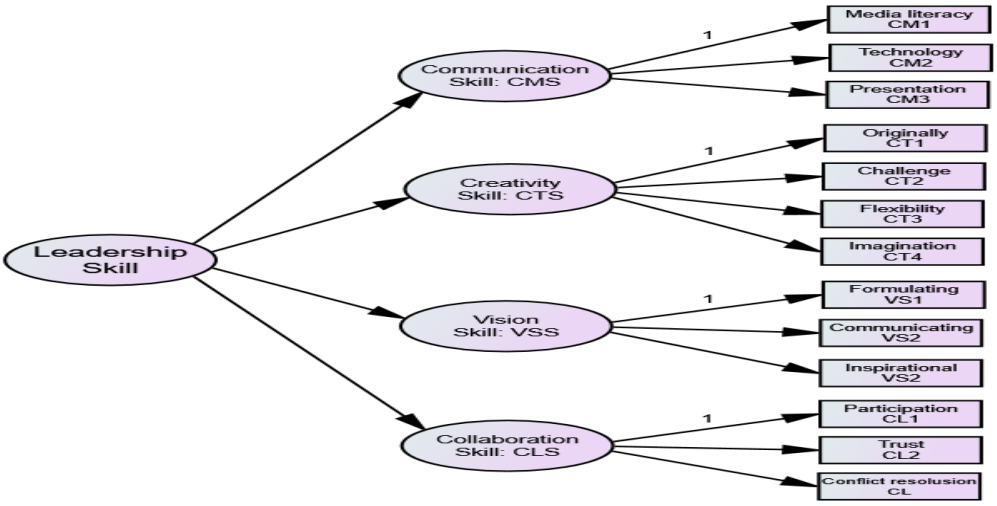

Figure 2 Show Second Order of Confirmative Factor Analysis of 21 Century Leadership indicators skill for the school administrators under Anshan Normal University
Chi-square = 34.98, Relative chi-square = 1.39, df = 25, p-value = 0.09
GFI = 0.98, AGFI = 0.97, RMSEA = 0.03

Table 3 Second Order of CFA. to develop indicators of leadership skills in the 21 century for school administrators of Anshan Normal University.

Factors/ Indicators	λ	S.E.	t	FS	R^2	Rank Order
1.Communication Skills (CMS)	**0.84**	**0.07**	**16.96****	-	**0.71**	**4**
(1) CM1	0.81	0.06	17.54**	0.26	0.66	2
(2) CM2	0.70	0.07	16.14**	0.05	0.49	3
(3) CM3	0.92	0.07	18.49**	0.46	0.85	1
2. Creativity Skill (CTS)	**0.96**	**0.08**	**18.19****	-	**0.92**	**1**
(1) CT1	0.77	0.05	16.79**	0.12	0.59	4
(2) CT2	0.81	0.05	20.95**	0.16	0.66	3
(3) CT3	0.83	0.06	22.68**	0.18	0.69	1
(4) CT4	0.82	0.05	21.96**	0.20	0.67	2
3. Vision Skill (VSS)	**0.93**	**0.07**	**17.56**	-	**0.86**	**2**
(1) VS1	0.89	0.04	27.12**	0.12	0.80	2
(2) VS2	0.91	0.05	28.95**	0.15	0.83	1

Table 3 (Next)

Factors/ Indicators	λ	S.E.	t	FS	R^2	Rank Order
(1) VS3	0.81	0.04	17.55**	0.17	0.66	3
4. Collaboration Skill (CLS)	**0.88**	**0.08**	**16.78****	-	**0.77**	**3**
(1) CL1	0.87	0.05	25.74**	0.75	0.76	2
(2) CL2	0.87	0.04	25.74**	0.76	0.76	2
(3) CL3	0.89	0.04	27.13**	0.77	0.79	1

Based on Figure 2 and Table3, the results of the analysis of the Second Order of Confirmatory Factor Analysis the model of leadership indicators skills in the 21 centuries for the school administrators of Anshan Normal University the result revealed that: the model is very consistent with empirical data. Because the conformity index meets certain criteria such as values of: Chi-square (χ^2), Relative chi-square (χ^2 / do), the p-value must be greater than 0.05 ($p > .05$), its mean was insignificant. Only the Relative chi-square value must be less than 2 (Diamantopoulos, A. et al.,2000; Schumacker, R.E. &Lomax, R.G. (2010). GFI, AGFI must be greater than 0.95, and also SMSEA must be less than 0.05 as well.

The results of this second-order analysis by using the CFA., showed that Chi-square = 34.98, Relative Chi-square = 1.39, df = 25, P-value = 0.09, which means that chi-square is not statistically significant, and the absolute fit index as Goodness of Fit Index (GFI) value is 0.98, the Adjusted Goodness of Fit Index (AGFI) value is 0.97, and the Root Mean Square Misalignment in the Estimated Parameter (RMSEA) equal to 0.32

Therefore, based on the results of this analysis, it can be concluded that the 21-century leadership indicator model of the administrators that developed from theory and research related and empirical data was consistent. It was based on research assumptions.

And when considering the details of the model according to the figure and the table presented earlier. In other words, can be said that the 21 century leadership indicators skills model for the school administrators in Anshan Normal University that developed consists of four key components/factors and thirteen indicators, its consisted of:

1. Communication Skills (CMS) there were 3 indicators: Media literacy (CM1), Technology (CM2), and Presentation (CM3)

2. Creativity Skill (CTS) there were 4 indicators: Originality (CT1), Challenge (CT2), Flexibility (CT3) and Imagination (CT4)

3. Vision Skill (VSS), there were 3 indicators: Formulating vision (VS1), Communicating vision (VS2) and Inspiration (VS3), and

4. Collaboration Skill (CLS) there were also 3 indicators: Participation (CL1), Trust (CL2), and Conflicts resolution (CL3)

And all of 4 main components included the indicators were statistically significant at .01 ($p < .01$).

As follows from the criteria of Farrell, A. M., & Rudd, J. M. (2011): Pett, Lackey, & Sullivan (2003), factor loading is basically the correlation coefficient for the variable and factor. Factor

loading shows the variance explained by the variable on that particular factor. In the SEM approach, as a rule of thumb, 0.7 or higher factor loading represents that the factor extracts sufficient variance from that variable. As the same mentioned from many academic scholars the factor loading value should be equal to or greater than 0.7 and equal to or greater than 0.30 for sub-components or indicators (Agresti, A.(2015) Therefore, in these 4 components/factors 13 indicators the value of factor loading was very high. The most important was creativity skill (CTS), the value of factor loading = 0.96 and $R^2 = 0.92$. Followed by Vision Skill (VSS), factor loading = 0.93 and $R^2 = 0.86$, followed by Collaboration Skill (CLS), factor loading = 0.88 and $R^2 = 0.77$, and the last component with the least importance in the group was Communication Skills (CMS), factor loading = 0.88 and $R^2 = 0.77$, respectively.

The first component that showed the most importance was creativity skill (factor loading = 0.96), the importance of the indicator by rank order were the indicator of flexibility (CT3), Imagination (CT4), Challenge (CT2), and Originality (CT1), the factor loading were 0.83, 0.82, 0.81 and 0.77 respectively.

The second component that showed the follow importance was Vision Skill (factor loading = 0.93), the importance of the indicator by rank order were the indicator of Communicating vision (VS2), Formulating vision (VS1), and Inspiration (VS3) the factor loading was 0.91, 0.89, 0.81 and 0.81 respectively.

The third component that showed the follow importance was Collaboration Skill (factor loading = 0.88), the importance of the indicator by rank order were the indicator of Cconflicts resolution (CL3), Participation (CL1), and Trust (CL2), the factor loading was 0.89, 0.87, and 0.87 respectively.

The fourth component that showed the follow importance was Communication Skills (factor loading = 0.84), the importance of the indicator by rank order were the indicator of there were 3 indicators: presentation (CM3), Media literacy (CM1), and Technology (CM2), the factor loading was 0.92, 0.81, and 0.70 respectively.

Summary; This chapter mainly analyzes the questionnaire data, using statistical software to get the results. The statistics describe and testing involved of the latent and observed variables were calculated, and it was concluded that all the other hypotheses were valid except for the model development.

The model development showed that there were four factor of the 21 century leadership indicators for the school administrators of Anshan Normal University. By rank order from high to low respectively, it's creativity skill with the indicator of flexibility, imagination, challenge, and originality; vision skill with the indicators of communicating vision, formulating vision, and inspiration; collaboration skill with the indicators of conflicts resolution, participation, and trust.

Conclusion

Data analysis uses descriptive statistics to determine the frequency, distribution and percentage values in analyzing the background data of the respondents. and analysis of average values, standard deviations. and the distribution of leadership skills in the 21 centuries for school administrators. The inferential statistics used in the analysis include Pearson Correlation Coefficients,

Structural directness analysis by Confirmatory Factor Analysis (CFA.) with a statistically ready-made program (SPSS for Windows) and AMOS program to analyze models of structural equations or linear structure analysis (SEM.).

1. The respondents in this studied 247 persons, female was slightly more numerous than that of male. The majority were over the age of 40 years or older, with 279 people and follow the age of 31- 40 year. The qualification about half of them had a bachelor's degree, the rest had a higher level: 34.58% were at master degrees and 12.29% were doctoral degrees. In these respondents the majority of 398 or 82.92% were art design teachers, the rest were administrator's position. The majority 48.75% were the assistant professors, only 13.33% and 5.00% were associate professors and professor respectively. And for working experience in their positions 56.67% with 11-15 years of experience, more than that about 20% and the rest were below.

2. The appropriateness of the 21 century leadership skills indicators for school administrators in order to select a structural correlation model by comparing it with an average threshold equal to or greater than 3.00 and a distribution coefficient equal to or less than 20%, the findings are as follows:

2.1 The component of communication skills (CMS) consists of three indicators: media literacy, technology, and presentation. the average value was between 4.07-4.57 and the distribution coefficient were between 12.13-16.92.

2.2 The component of creativity skills (CTS) consists of four indicators: originality, challenge, flexibility, and imagination, the average value were between 4.28-4.52 and the distribution coefficient were between 12.50-14.56 .

2.3 The component of vision skill (VSS), consists of three indicators: formulating, communicating, and inspiration, the average value were between 4.28-4.2 and the distribution coefficient were between 12.60-14.19.

2.4 The component of collaboration skill (CLS), consists of three indicators: participation, trust, and conflicts resolution, the average value was between 4.07-464 and the distribution coefficient were between 11.19-16.92.

3 The consistency of the structural relationship model of the 21 century leadership skills indicators for Anshan Normal University which developed from the theory and research related with the empirical data. This is the Chi-square value (χ^2), It is not statistically significant (p-value) must be higher than 0.05, GFI and AGFI values higher than 0.95 and RMSEA values must be less than 0.05 appear in the following second order of data analysis.

In summary, the Pearson Correlation Coefficient of variables indicating leadership skills in the 21century for all measured models, the statistically significantly correlated at .01 level. ($p<01$). The model is very consistent with empirical data to a very good extent. The Chi-square value (χ 2) is equal to 34.98, df equals 25, P-value equals 0.09, GFI equals 0.98, AGFI equals 0.97, and RMSEA equals 0.03 as follow from the criteria of conformity assessment. The investigation revealed that the weight of the four indicator factors were positive the value of 0.84 – 0.96 and is statistically significant at the level of .01.

The results of this analysis show that the 21-century leadership skills indicator structure model for school administrators under Anshan Normal University consists of 4 components of 13 indicators, including 72 questionnaire questions, that can be used to measure the 21 century leadership skills for the university administrators structurally direct. This is compounded by the

essential and essential skills in the changing environment in the 21 centuries: communication skills, creative skills, vision skills and collaboration skills. The researchers created a mind map as shown in figure 3

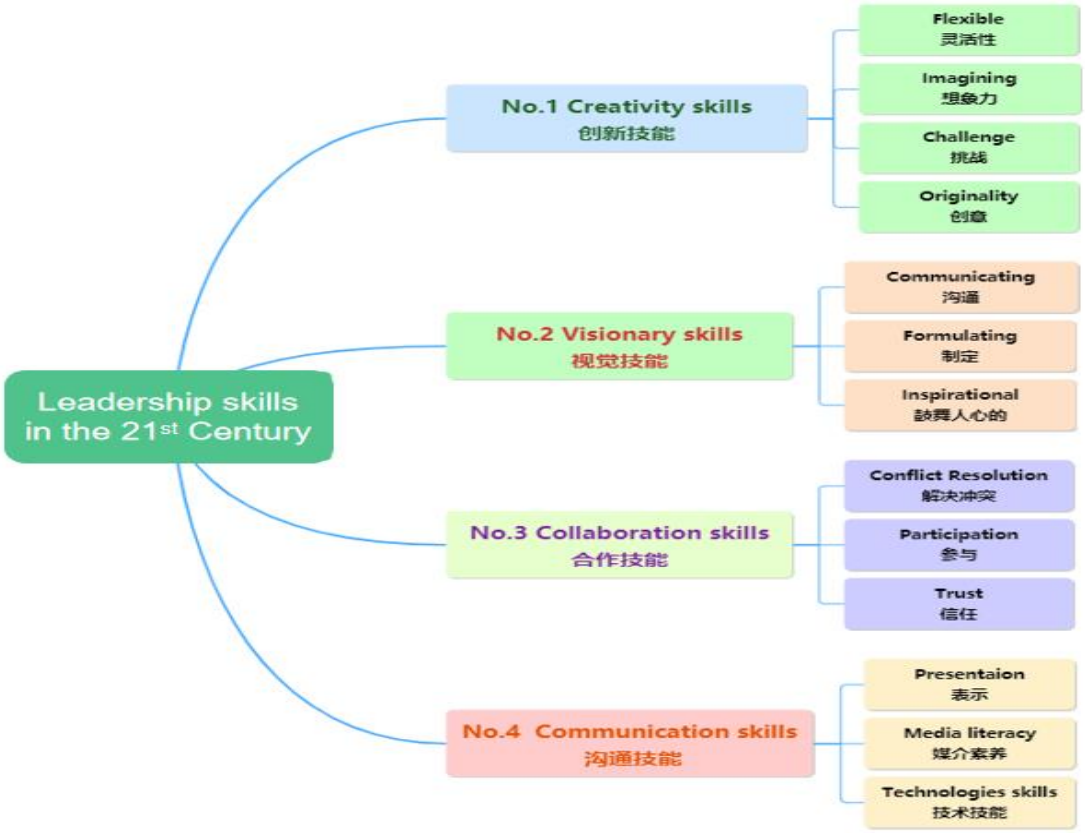

Figure 3 The 21-century leading skills mind map for Anshan Normal University administrator

Discussion

Based on the above-mentioned findings, researcher would like to discuss the results in order to make the following suggestions as follow:

Suitability of the 21 century leading indicators for management to select and define in structural relationship models prior to Confirmatory Factor Analysis (CFA.). That's based on the findings. It was found that all were averaged during the period. 4.07 - 4.64 and the distribution coefficient between 11.19-16.92, thus showing that all of them are appropriate. It can be selected in a structural correlation model, since everyone has an average value equal to or greater, and the C.V. not more than 20%. Therefore, this finding is consistent with the results of statistical analysis, and each model is statistically significantly correlated at the level of .01 ($p < 0.1$) for all the variables.

In addition, baertlett statistical analyses and Kaiser-Mayer-Olkin Measurers of Sampling Adequacy (MSA) also found that the correlation matrix between variables differed statistically significantly from the identity matrix at .01 by the Baertlett test of Sphericity. The Kaiser-Mayer-

Olkin Measurers of Sampling Adequacy (MSA) values are the same as equal 0.932, 0.927, 0.954, and 0.955, respectively, with all values being very high. (because of > 0.80). It shows that all indicators are very correlated and appropriately can be used to analyze the CFA. This may be due to the research methods used to create and develop indicators using empirical definitions. According to Kim, J. O., & Mueller, C. W. (1978); Pett, Lackey & Sullivan (2003); Hair et al (2010); Agresti, A. (2015); Agresti A. (2015), and Poonpong Suksawang. (2020), that with structural correlation models, indicators. the theory and research are fundamental to it. This results in the researchers having to study the theory and research referenced with awareness. Including research results systematically and logically from a variety of sources and results through analytical, synthetic methods to obtain key components, sub-components, operational definitions, and indicators or main strands, so that the measurements in each component are accurate in accordance with the principal and theory. According to the scholars cited, is considered to be of great importance. Regardless of how good statistical techniques are used, the results of development are either bad or poor quality. Also, as suggested by scholars, particularly Viroj. Sararatna (2015) Poonpong Suksawang (2020), Sukhum Moonmuong (2022: interview) all mentioned that the study of theories and research results to define them is the main component. subcomponents operational definitions and indications or main strands. The validity of the content must be taken into account. The researchers also took into account the principles of Max-Min-Con strictly. This includes determining sample size, randomization methods, and creating and developing the quality of research instruments that are academically correct.

Consistency of structural relationship models' indicators of 21 century leadership skills for school administrators of Anshan Normal University was developed from theory and research with empirical data.

According to the findings, 1) the measurement model of each of the main components developed from the theory and research results, there is a very good consistency with the empirical data. It shows that all the indicators studied were important indicators of the leadership skills component in the 21 centuries for the management of Anshan Normal University and 2) A structural relationship model for 21-century leadership skills for the administrators that developed from theory and empirical research by analyzing the second order of CFA.from 13 indicators. It is consistent with empirical data to a very good extent, it is based on the chi-square value (χ 2) equal to 34.88, df equal 25, P-value equal to 0.09.

This may be due to past and present circumstances. University administrators are developed to develop attributes or behaviors that are consistent with the theory or the research results as defined are the main components and indicators used in the research. This demonstrates the expressive behavior of the brigands, which is consistent with the agency's policies related to the development of educational personnel to have core competency. It consists of 1) Achievement Motivation, (Baum, R.J.& Locke, E.A. (2004) 2) Service Mind, 3) Expertise, 4) Teamwork, and Functional Competency consisting of 1) Analytical Thinking Conceptual Thinking, 2) Communication Influencing, 3) Caring Development Others, 4) Visioning, which the University supports and promotes through various channels, including from departments affiliated with the University.

In conclusion the findings showed that: The 21 century leadership skills indicator structural relationship model for Anshan Normal University administrator consists of 4 main components and

13 indicators developed from the theory and research, which is useful for creating a model for measuring and evaluating indicators of leadership skills in the 21 th century, therefore it can be used as a guideline for creating training programs to develop all executives to have leadership skills in the 21 century, which can be used as a tool for self-development and increase the efficiency of educational institutions, which will further contribute to the overall improvement of the quality of education.

According to the results of the research, the factor loading value of the main element. The weight value of the 13 indicators meets a certain threshold, i.e., the composition value of the main component is the same as the higher one 0.70 and the factor loading value of the main component and indicators, equal to or higher than 0.30, suggests that the 21 century leadership skills indicator structural relationship model for school administrators consists of 4 key components, 13 indicators that can be used to measure leadership skills in the 21 century. This may be due to the main components and indications used in research, which have been studied by a variety of theories and research sources. There is a synthesis for selection in the model. It takes into account the validity of the content or of the variables studied at all stages, both in the process of defining the elements and indicators, and the operational definition. Show me. This developed structural relationship model 21 to achieve a measure of leadership skills in the 21 century for the administrators of Anshan Normal University, it can be used as a tool for self-development and development of other people in the same context. To further enhance the efficiency of the educational institution.

The findings are good. It is noted for the benefit of applying the findings. To develop leadership skills in the 21 century for school administrators to be a priority as follow

1. In the key component case should focus on creative skil first follow with the vision, cooperation, and communication skills, respectively.

2. In the key component case of communication skills should focus on the indicators of presentation media literacy and technology, respectively.

3. In the key component case of creative skills should focus on the indicators of flexibility, imagination. challenges and origination , respectively.

4. In the case of key elements, vision skills should focus on indicators, motivation. Creating vision and communicating vision, respectively.

5. In the case of key elements, cooperation skills should focus on indicators, conflict resolution, trust, and participation, respectively.

6. In the case of indicators, media literacy should give priority to the item. Ability to choose the right medium Because there's a high weight value to other items.

7. In the case of technology indicators, the importance should be given to the list of technological application capabilities. The development of tools and appliances to make the work efficient because it has a higher element weight than other items.

8. Indicator case Presentation Should focus on the item. Be able to plan and determine the purpose of the presentation. Because there's a high weight value to other items.

9. Indicator case Initiatives should focus on the list. Having self-confidence Ready to face different situations and dare to make decisions in creating new works. Because there's a high weight value to other items.

10. In case of indicators, challenges should be given priority to the list. Daring to make decisions in high-risk conditions because there's a high weight to the list.

11. Indicator case Stretching Should focus on the list, the ability to adjust the performance plan as appropriate, because it has a high weight value that other items.

12. Indicator case Imagination should give priority to the list, be thoughtful, discreet, and prudent in its performance, because it has the high weight of other items.

13. In the case of indicators, creating a vision should give priority to the item. It's a challenge to find solutions to problems in new ways because of the heavy water costs. The composition is higher than the others.

14. In the case of indicators, vision communication should give priority to the program. Incentivize stakeholders to be willing to work to achieve their vision and involve everyone. Targets and activities that are in line with the vision because they have a higher water value than other items.

15. In the case of indicators, motivation should focus on the list of support. Promote creative initiatives to aim for the ultimate goal because of the heavy water value. The composition is higher than the others.

16. In the case of indicators, participation should be given priority to the item. Using the results of the assessment to improve the work and develop the work because it has a higher weight value than other items.

17. In the case of indicators, trust should give priority to each other, be sincere, and help each other. Dhoni is not hoping for a return. Because it has a higher water value than other items.

18. In case of indicators, conflict resolution should give priority to the promotion list. Participation in the purpose of organizing and creating popularity of co-operation because it has a higher water value than other items.

Recommendations

Based on the findings, There are three main recommendations: recommendations based on research findings and policy recommendations. Suggestions for utilization and suggestions on issues that should be studied in the next place.

1. Recommendations based on research findings and policy formulation

1.1 The Liaoning School District and provincial offices can use the 21 century leadership skills indicators for school administrators, as a result of this research, to be used in planning develop the leadership skills of school administrators. To allow school administrators to be developed into professional executives in line with leadership skills in the new era or in the 21 century.

1.2 Ministry of Education and Office of the Education Commission can take the leadership skills in the 21 century for school administrators as a result of this research, as a result of this research, to be a policy to develop school administrators to have knowledge and understanding of the value of leadership in themselves. Especially the leadership skills for executives in the 21 century, which are skills that need to be strengthened in the leadership. at various levels.

1.3 Office of the Board of Education can take the 21 century Leadership skills for school administrators as a result of this research, it is a guideline for determining standard indicators. For the development of teachers and educational personnel. Prior to the establishment, he was promoted to the position of school administrator. Deputy Director and Director, as well as the implementation of standard indicators of entry into positions. School Administrators

Suggestions for further research

1. Research should be conducted to create new knowledge using qualitative research methods, since this research is a hypothetical model based on theory and research, so if there is qualitative research, knowledge may be obtained that may be different from this, and it will be useful to explain leadership skills in the 21 century. For more school administrators.

2. Research should be done to be treated in a way that puts the findings into practice, such as: Participatory Action Research may guide these findings, such as the development of indicators that show high averages, as well as the development of elements with high component weight values.

3. Research and Development should be conducted using the models tested by this research. It is a guideline for obtaining a program to develop leadership skills in the 21 century for school administrators, which will contribute to their personal development and the quality of education.

4. Research should be conducted to create models, measure and evaluate indicators of leadership skills in the 21 century. For school administrators, to provide tools to measure leadership skills in the 21 century, for school administrators and for other school administrators. It is used as a tool for further self-development.

5. Research should be conducted on the development of indicators and leadership skills in the 21 century for other school administrators, such as private school administrators. Administrators affiliated with the Office of Vocational Education, education administrators in school district offices. or executives in other companies in the same context to obtain a variety of indicators of 21 century leadership skills that are appropriate to the context of the organization.

6. There should be research in the evaluation and follow-up. Bringing leadership skills in the 21 century for school administrators.

Reference

Agresti, A.(2015) *In International Encyclopedia of the Social & Behavioral Sciences* (Second Edition).

Agresti A. (2015) *Factor analysis and discriminant validity: A brief review of some practical* issues. Retrieved January 4, 2011 from http://www.duplica tion.net.au/ANZMAC09/ papers/ANZMAC2009-389.pdf

Agresti A.. (2015) M*ultivariate Analysis: Discrete Variables (Overview*)Author links open overlay . *International Encyclopedia of the Social & Behavioral Sciences* (Second Edition) 2015, 131-136

Baum, R.J.& Locke, E.A. (2004). The Relationship of Entrepreneurial Traits, Skill and Motivation to subsequent Venture Growth. *Journal of Applied Psychology*, 89, 587-589.

Diamantopoulos, A., & Siguaw, J. A. (2000). *Introducing LISREL*. London: Sage Publications. https://doi.org/10.4135/9781849209359

Farrell, A. M., & Rudd, J. M. (2011). *Factor analysis and discriminant validity: A brief review of somepractical* issues. Retrieved January 4, 2011.

Hair, J.F., et al (2010) *Multivariate Data Analysis.* 7th Edition, Pearson, New York.

Kim, J. O., & Mueller, C. W. (1978). *Factor Analysis: Statistical Methods and Practical* Issues. Beverly Hills, CA: Sage.

Munby, S.& Fullan M., (2020). Inside-out and downside-up: How leading from the middle has the power to transform education system, European Journal of Educationresearch, Development and Policyissn 55(2) https://doi.org/10.1111/ejed.12394

Pett, M.A., Lackey, N.R. & Sullivan, J.J. (2003) Making Sense of Factor Analysis: The Use of Factor Analysis for Instrument Development in Health Care Research. SAGE Publications, Thousand Oaks.http://dx.doi.org/10.4135/9781412984898

Schumacker, R.E. &Lomax, R.G. (2010) A Beginners Guide to Structural Equation Modeling. Routledge, New York.

interview

Viroj. Sararatna (2015).

Poonpong Suksawang (2020).

Sukhum Moonmuong (2022).