A Digital Leadership Development Model for School Administrators in Basic Education to Fulfill the Thailand 4.0 Policy

Thawatchai Suksai
Graduate School, Suan Dusit University, Thailand
E-mail: thawatchaisu@energy.go.th

Pannee Suanpang*
Faculty of Science & Technology, Suan Dusit University, Thailand
Corresponding author: E-mail: pannee_sua@dusit.ac.th

Rungnapa Thangchitcharoenkhul
Graduate School, Suan Dusit University, Thailand
E-mail: rungapa_tan@dusit.ac.th

Article History
Received: 27 October 2021 **Revised:** 15 November 2021 **Published:** 16 November 2021

Abstract
The objectives of the study on "A Digital leadership development model for school administrators in basic education to fulfil Thailands 4.0 policy" were 1) To explore the components of Digital Leadership 2) To develop a Digital Leadership model. The sample group was 591 samples from medium-size schools affiliated to Buriram provincial educational office. The results of the study were as follows: 1) Components of Digital Leadership in the following aspects: (1) Vision Leadership (2) Use of Digital Technology in teaching (3) Use of Digital Technology in management (4) Digital Technology support and management in education (5) Use of Digital Technology in measurement and evaluation and (6) Ethics in the use of Digital Technology. 2) Model of Digital Leadership development: (1) Context (1.1) Policy is a guideline for implementation (1.2) Principle is a guideline for development (1.3) Objective of indicating changing behaviours (2) Guideline for Digital Technology development (2.1) Input consists of Administrative structure, Technology, Organizational culture (2.2) Digital Technology development process such as Design thinking process (2.3) Digital Leadership productivity and cognition (2.4) Feedback, both direct and indirect was useful Information for the Digital Technology development model that was suitable, feasible, useful, and consistent with the research framework. Data analysis statistics were Frequency, Percentage, Mean, Standard Deviation, Exploratory Factor Analysis, and Confirmatory Factor Analysis.
Keywords: Digital Leadership, Leadership, Educational Management, Basic Educational Institutions

Introduction
The 20-year National Strategy (2017-2036) has the purpose of building stability, prosperity and sustainability for the country. To become a developed country with development according to the Sufficiency Economy Philosophy leading to happiness of the Thai people and responding to the achievement of national interests in improving the quality of life and

Citation Information: Suksai, T., Suanpang, P., & Thangchitcharoenkhul, R. (2021). A Digital Leadership Development Model for School Administrators in Basic Education to Fulfill the Thailand 4.0 Policy. *PSAKU International Journal of Interdisciplinary Research, 10*(2), 11-20. https://doi.org/10.14456/psakuijir.2021.2.

raising incomes as a developed country. The National Education Act, Chapter 9 is on Technologies for Education by promoting utilization of technology in education with the focus on applying ICT in teaching. The National Information and Communication Technology policy framework (IT 2020) has determined that the administrators of basic educational institutions have a top role in driving the utilization of ICT in education. Therefore, training and educating the school administrators to have visions and strategies on ICT management for education in institutions was a high priority. The central department in the main corporation of the Ministry of Education could not overlook the development of school administrators and should strengthen the capacity of the Educational Service Area Office to be capable to act as a mentor in supporting the utilization of ICT for teaching in institutions. At present, Thailand has no research on building basic education administrators to be digital leaders in order to drive Thai Education 4.0 and prepare for a digital and learning society by focusing on human resource development strategies with people who are intelligent, discerning, having lifelong learning as well as having digital technology utilization skills. As mentioned, the importance of Digital Leadership for administrators of basic educational institutions as well as the necessity of adjusting the digital technology transformation, therefore, the researchers are interested in studying the Digital Leadership development model of administrators of basic educational institutions in order to achieve better Digital Leadership and to be an important factor that influences in work achievement as a guideline for developing digital technology management for more efficient education in the future.

Research Methodology

Population and sample

3,599 administrators and 44,274 teachers and educational personnel of basic educational institutions under the Office of the Basic Education Commission (OBEC) in Government Inspectorate no.13 of the academic year 2020. Therefore, the population of this research are administrators of basic educational institutions under the Buriram Provincial Education Office during the 2020 academic year, 445 samples were determined by using Krejcie and Morgan Table at 95% confidence level and 5% allowable error and 210 samples were determined by purposive sampling. Teacher and educational personnel under Buriram Provincial Education Office, 7,138 samples were determined by using Krejcie and Morgan Table at 95% confidence level and 5% allowable error and 381 samples were determined by purposive sampling.

Data Collection and Analysis

Step 1: The factor analysis of Digital Leadership by interviewing 10 qualified people with a structured interview form.

Step 2: The creation of a Digital Leadership development model by collecting data from the administrators of educational institutions, teachers and educational personnel.

The created questionnaire consisted of 2 parts that are: 1) Demographic factors including gender, age, level of education, title, work experience, experience in holding position and experience on information technology utilization. 2) Digital Leadership components and behaviours including 9 items of vision leadership, 7 items of the use of Digital Technology in teaching, 8 items of the use of Digital Technology in management, 8 items of Digital Technology support and management in education, 5 items of the use of Digital Technology in measurement and evaluation and 7 items of ethics on the use of Digital Technology were measured by a 5-level Likert Scale where 5 represents the highest and 1 represent the lowest. While the definition of an average was interpreted according to the criteria of (Srisa-ard, 2002), the statistical data analysis consisted of frequency, percentage, mean, standard deviation and exploratory factor analysis, orthogonal rotation by the varimax method, the

factor was determined by the selection criteria for variables with a weight of 0.50 and above, each factor consists of more than 3 variables and Confirmatory Factor Analysis.

Conceptual Framework

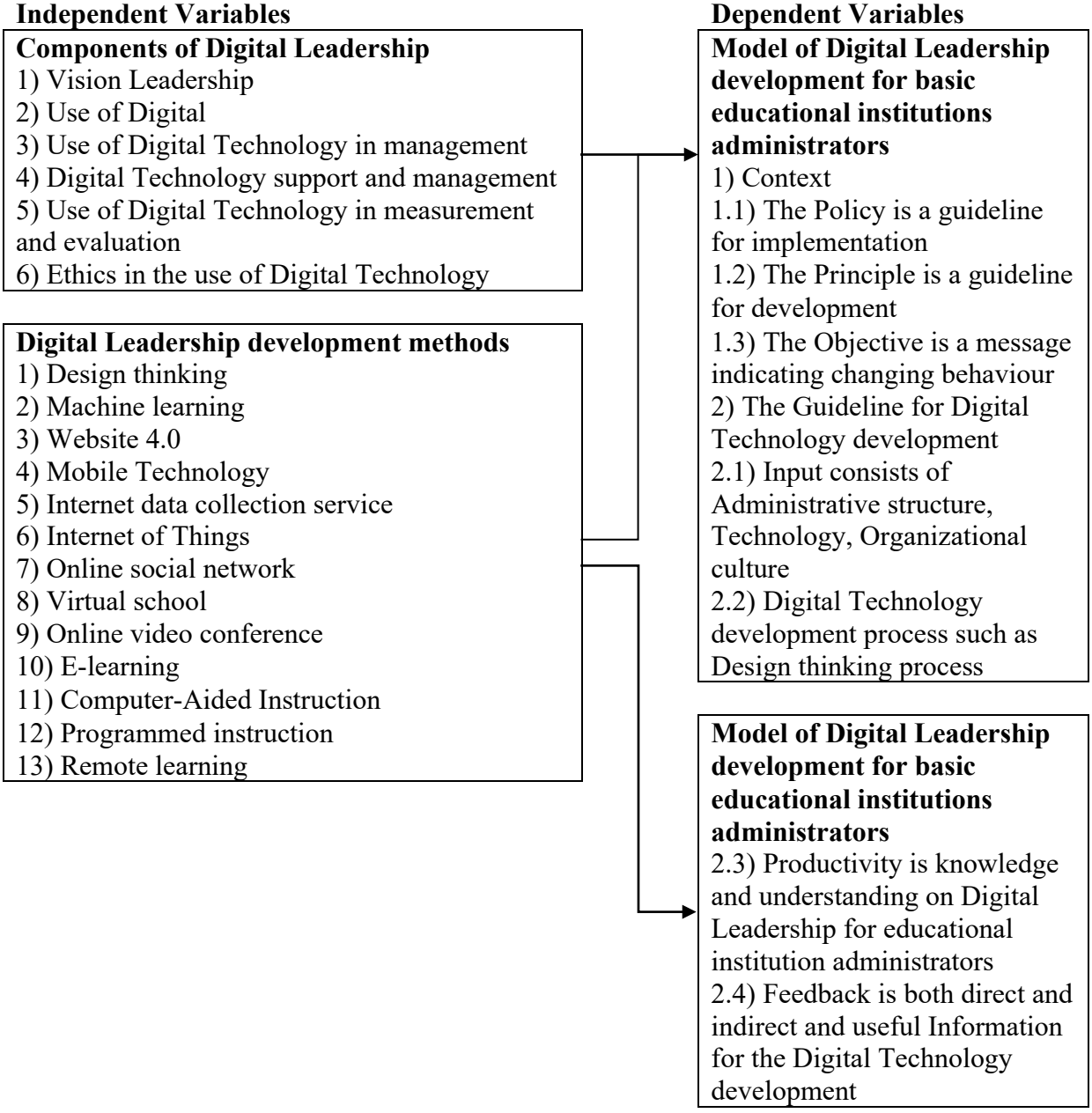

Figure 1 Conceptual Framework

Research Results

Demographic Factor

Most samples in this survey were women (54.8%), aged under 40 years (44.5%), graduated with a Master degree (51.9%), working as a teacher (52.5%), more than 15 years of work experience (37.9%), 1-5 years-experience in holding current position (69.2%), 11-15 years-experience in the use of Information Technology (29.6%), and skills for the use of Information Technology on Social media (100%).

The importance of the Digital Leadership factor

Overall, the importance of the 44 variables of Digital Leadership of Muangsong (2007); Poltree (2014); Sriboonruang (2014); Kerdtip (2007); Tawee-uthit (2016); Khammanee (1999); Nak-ai; (2006); Sriaram (2010); Peerthanom (2011); Sawangsri (2011); Wiriyajanya

(2016); Wongsakul (2011); Chen et al. (2013); Chua (2017); Dubrin (1995); Daft (2008); Good (1973); Kozloski (2006); Keeves (1997); International Society for Technology in Education (2012); National Educational Technology Standards (2015); Truelove (1992); Sheninger (2014); Willer (1967); Will (1993); Yee (2000) found that an average ($\bar{x}$) = 4.22 indicating that the overall opinion of the respondents to the importance of Digital Leadership variables was at a high level, Standard Deviation (S.D) = 0.941 indicating that the level of opinion distribution of most respondents was in level 4 with some respondents in level 3 and 5. This indicated that the respondents had similar opinions. Exploratory factor analysis (EFA) using Principle Component Analysis Factor Extraction and Varimax Orthogonal rotation found that the KMO value was 0.909, that was greater than 0.80 indicating that this set of variables were highly appropriate for factor analysis according to the criteria of Kim and Mueller and the results of Bartlett's Test of Sphericity found that all variables were statistically significant correlation at the 0.01 (Angsuchote et al., 2014).

Table 1 Results of KMO from Exploratory Factor Analysis and Bartlett's Test of Sphericity

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.909
Bartlett's Test of Sphericity	Approx. Chi-Square	333855.168
	df	946
	Sig.	0.000

The result of Eigen values, Percentage of Variance and Cumulative Percentage of Variance from Exploratory Factor Analysis was more than 1 (Wanichbancha, 2011) with 8 components, the percentage of variance was between 2.424-52.394 and the percentage of cumulative variance was 79.058% indicating that all 8 components could explain the factor variance of 79.058.

Table 2 Percentage of Variance and Cumulative Percentage of Variance

Component	Initial Eigen values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	23.053	52.394	52.394	23.053	52.394	52.394	23.053	52.394	52.394
2	2.346	5.332	57.725	2.346	5.332	57.725	2.346	5.332	57.725
3	2.091	4.752	62.478	2.091	4.752	62.478	2.091	4.752	62.478
4	1.793	4.075	66.552	1.793	4.075	66.552	1.793	4.075	66.552
5	1.748	3.972	70.524	1.748	3.972	70.524	1.748	3.972	70.524
6	1.473	3.349	73.873	1.473	3.349	73.873	1.473	3.349	73.873
7	1.215	2.761	76.634	1.215	2.761	76.634	1.215	2.761	76.634
8	1.067	2.424	79.058	1.067	2.424	79.058	1.067	2.424	79.058

When all 8 components that had variance (Eigen values) valued at more than 1 were rotated orthogonal with the Varimax method in order to make the relation between the variables and components clearer. Digital Leadership components for basic educational institution administrators to respond to THAILAND's 4.0 policy could be concluded to 6 components, the percentage of variance was between 2.761-52.394 and the percentage of cumulative variance was 76.634%, indicating that all 6 components were 1) Vision Leadership 2) Use of Digital Technology in teaching 3) Use of Digital Technology in management 4) Digital Technology support and management 5) Use of Digital Technology in measurement and evaluation and 6) Ethics on the use of Digital Technology could explain the factor variance of 76.634.

Table 3 Percentage of Variance and Cumulative Percentage of Variance

Component	Initial Eigen values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	23.053	52.394	52.394	23.053	52.394	52.394	23.053	52.394	52.394
2	2.346	5.332	57.725	2.346	5.332	57.725	2.346	5.332	57.725
3	2.091	4.752	62.478	2.091	4.752	62.478	2.091	4.752	62.478
4	1.793	4.075	66.552	1.793	4.075	66.552	1.793	4.075	66.552
5	1.473	3.349	73.873	1.473	3.349	73.873	1.473	3.349	73.873
6	1.215	2.761	76.634	1.215	2.761	76.634	1.215	2.761	76.634

Digital Leadership Development Model Creation

1) The Context of Digital Leadership development. The policy was a guideline or framework that was determined for implementation or goal achievement. The principle was that the guidelines were for developing administrators to achieve model objectives. The objective was a statement indicating a change in behaviour as a result of development occurring with identified developed people.

2) A Guideline for Digital Leadership Development. The input was suppliers that should consist of a cooperative network including both those inside and outside the educational institutions that consist of the following factors: Educational institution management structure of digital, technology, and culture. The process was Digital Leadership development process such as the design thinking process and online social networks. Productivity was effective and efficient knowledge and understanding on Digital Leadership for educational institution administrators. Feedback was both direct and indirect with useful information for the Digital Leadership development model for administrators of basic educational institutions.

Conclusion and Discussion

Digital Leadership for administrators of basic educational institutions to respond to THAILAND 4.0 policy consists of 6 components in accordance with the Education Act. Component 1, Vision leadership according to the concept of (Kerdthip, 2007) who discovered that personality was a key feature of educational technology leadership that differentiated between educational technology leader and technology manager. This component was very important for educational technology leadership because personality was fundamental to the expertise for technology integration and workload. This was consistent with the Concept of Strategy 3: Infrastructure development on ICT (Ministry of Education, 2014-2016). In order to expand lifelong learning opportunities and access to educational services, the allocation of frequencies and infrastructure for radio and TV broadcasting along with an information and communication technology network that could provide comprehensive services and sufficient tools and equipment for education. Component 2, Use of Digital Technology in teaching according to the research of (Nak-ai, 2006) who discovered that the regression coefficient of ICT utilization in the learning of students influenced the effectiveness of Electronic Leadership of administrators to be statistically significant at 0.01. This indicated that the achievement of educational administration and management of ICT of administrators significantly resulted from ICT utilization in the learning of students, which was consistent with TSSA standard, Standard 2 on learning and teaching, Indicator 1, to assist teachers in technology utilization to access data sources, analyze and understand student information; Indicator 2, to jointly design, implement, promote, and develop participation in developing teaching by integration with technology for teachers to become professionals in order to improve student learning. This was also consistent with the findings of Chawalit Kerdthip on technology integration with education management. The role of educational technology leadership is to assist teachers in designing curriculum, teaching strategy and integrating learning environment with appropriate technology for excellent teaching and learning including integrating technology with the workload of school administrators. Component 3, The Use of Digital Technology in Management according to the concept of (Kerdthip, 2007) who found that technology integration with education management was a role of educational technology leadership that assisted teachers in designing curriculum, teaching strategy and integrating learning environment with appropriate technology for excellent teaching and learning including integrating technology with the workload of school administrators. The research of Nikom Nak-ai found that goal achievement of education administration and management of ICT of administrators at the classroom level resulted from teacher professional development and integration of ICT in the curriculum and teaching of teachers

significantly in accordance with Strategy 1 of the Information and Communication Technology Master plan for Education (Ministry of Education, 2014-2016) on upgrading the capacity of teachers and educational personnel in IT utilization and communication for education and to enhance the potential ICT utilization for the education of teachers and educational personnel. Component 4, Digital Technology Support and Management in Education according to the policy (Ministry of Education, 2020), determining the policy and standard of Information and Communication Technology for education to use in teaching and administration as well as to support the utilization of Information Technology and Communication in educational institutions. In accordance with the Ministry of Educations Strategic Plan 2020-2022, Strategic Plan 5: promoting and developing digital technology systems for education, aiming at reducing inequality among learners. Along with the research of (Sawangsri, 2011) who found that Information and Communication Technology Learning Resource Management to encourage learning, educational institution administrators who were developed could search information from websites for the benefit of managing existing educational institutions and communicate via e-mail. The management of learning sources and instructional innovative media on Information and Communication Technology, blogs were created for personnel for learning, fundraising for developing educational resources and public relations of educational institutions through Information and Communication Technology media were also encouraged. Component 5, The Use of Digital Technology in Measurement and Evaluation according to the research of (Kerdthip, 2007) who found that evaluation and supervision in educational technology leadership were measuring and evaluating technology utilization for planning and implementing technology plans including monitoring, supervising practitioners towards common goals and complying with Technology Standards for School Administrator (TSSA) that were developed under the cooperation of the Professional Education Association and International Society for Technology in Education (ISTE) and revised as a national standard in educational technology for administrators. Component 6, Ethics in the Use of Digital Technology according to the research of (Kerdthip, 2007) who found that rules and ethics in Educational Technology have the highest values of factor loading because of problems of computer regulations and procedures have not been adjusted properly. Therefore, problems with procedures and regulations were of the highest importance. According to the research of (Sriboonruang, 2014) who found that, generally, the use of Information and Communication Technology in the Northeast and ethics in ICT utilization were at the highest level.

The Digital Leadership Development Model for basic school administrators to meet THAILANDs 4.0 policy consists of 1) Context (1.1) The policy was a guideline or framework that was determined for implementation or goal achievement. (1.2) The principle was a guideline for developing administrators to achieve model objectives. (1.3) The objective was a statement indicating a change in behaviour as a result of development occurring with the identity of developed people. 2) The guidelines for Digital Leadership development for school administrators consists of (2.1) Input was suppliers that should consist of the structure of the digital school management, roles and duties of teachers in assisting, supporting and improving technology. This included digital technology that is an important tool to enhance various operations of educational institutions efficiently, including culture or organizational culture that was a concept of living and practices of administrators, values that adhere as a common practice between administrators and teachers in order to develop educational institutions to be digital innovative schools. (2.2) The process was the Digital Leadership development process such as the design thinking process, the learning of machines, online social networks, and the virtual school. (2.3) Productivity was knowledge and understanding of Digital Leadership for school administrators, effective and efficient Digital Leadership of school administrators and basic school administrators who participated

in the development had a higher average of attribute and behaviour for Digital Leadership. (2.4) Feedback was both direct and indirect useful information for the Digital Leadership development model for administrators of basic educational institutions. The information was appropriated, feasible, useful, accurate, comprehensive and according to theory, principles and concepts of the Research Framework. This was consistent with the study of (Wiriyajanya, 2016) who found that the academic leadership development model of small-sized school administrators under the Office of Elementary Education Service Area consists of 6 parts which were 1) Concept and Principle 2) Objective 3) Academic Leadership that needs to be developed 4) Academic Leadership development procedure 5) Development plan and 6) Development process. In accordance with the research of (Muangsong, 2007) who found that the first ranking for a model of Strategic Leadership development for basic educational institution administrators was an expert study tour. Its advantage was participants could learn from direct experience therefore the participants would be enthusiastic, excited, and have continuous interest, skills and application which was consistent with the research of (Peerthanom, 2011) who found that the model of integrated leadership development for administrators of private higher education institutions consists of 1) Input 2) Process 3) Output and 4) Feedback assessed by specialists based on the concept of (Eisner, 1976).

References

Angsuchote, S., Wichitwanna, S., & Pinyopanuwat, R. (2014). *Analytical statistics for research in social sciences and behavioral sciences Techniques for using LISREL program*. 4th ed. Bangkok: Prosperous and Stable Printing.

Chen, W., Ho, J., & Seong Ng, D. (2013). School leadership in ICT implementation: Perspectives from Singapore. *The Asia-Pacific Education Researcher*, *22*(3), 301-311.

Chua, Y. (2017). Hoe are e-leadership practices in implementing a school virtual learning environment enhanced? A ground model study. *Computer & Education*, *109*, 109-121.

Daft, R. (2008). *The Leadership experience*. 4th ed. Ohio: South-Western, Cengage Learning.

DuBrin, J. (2010) . *Principle of Leadership*. 6th ed. Canada: South-Western CENGAGE Learning.

Eisner, E. (1976) . *Educational connoisseurship and criticism: Their form and functions in education evaluation. The Journal of Aesthetic Education, 10*(2), 135.

Good, C. (1973). *Dictionary of education*. New York: McGraw-Hill.

International Society for Technology in Education. (2012). *National Educational Technology Standard for Administrators*. Retrieved from www.iste.org.

Krejcie, R., & Morgan, E. (1970). *Educational and psychological measurement*. New Jersey: Prentice-Hall.

Keeves, J. (1997) . *Educational Research, Methodology Measurement, An International Handbook*. Oxford: Pergamon Press.

Kerdtip, C. (2007). *Development Model of Educational Technology Leadership for School Administrators under the Office of Basic Education Commission in Southern Thailand*. Doctoral of Educational Administration Thesis, Songkla University.

Kozloski, K. (2006). *Principal leadership for technology integration: A study of principal technology leadership.* Doctoral Thesis, Drexel University.

Likert, R. (1984). *New Patterns of Management*. New York: McGraw-Hill.

Ministry of Education. (2013). *Information and Communication Technology Master Plan for education Ministry of Education 2014-2016*. Bangkok: Ministry of Education.

Muangsong, G. (2007). *A Model for Strategic Leardership Development of Administrators in Basic Education Institution*. Doctoral of Educational Administration Thesis, Burapha University.

Nak-ai, N. (2006). *The Factors of Leardership Characteristics and Factors Affecting E-LEADERSHIP Effectiveness for Basic Education Principals.* Ed.D. (Educational Administration) Dissertation, Srinakharinwirot University.

National Educational Technology Standards. (2015). *NETS for Administrators*. Retrieved from https://en.wikipedia.org/wiki/National_Educational_Technology_Standards.

Khammanee, T. (1999). *Teaching style: A variety of options*. Bangkok: Chulalongkorn University Press.

Peerthanom, P. (2011). *An Integrative Leadership Development Model for Administrators in Private Higher Education Institution*. Doctoral of Philosophy Thesis, Chulalongkorn University.

Poltree, K. (2014). *The Development Model of Research Leadership of Teacher under the Primary Educational Service Area in the Inspection Region 11*. Doctoral of Educational Administration Thesis, Sakon Nakhon Rajabhat University.

Sawangsri, S. (2011). *Development of The Information and Communication Technology Leadership for the School Administrators in the Basic Education School in Northeastern*. Doctoral of Educational Administration Thesis, Nakhon Ratchasima Rajabhat University.

Sheninger, E. (2014). *Digital Leadership*. California: Corwin.

Sriaram, D. (2010). *Development of A Transformational Leadership Development Model of School Administrators under the Office of the Basic Education Commission*. Doctoral of Philosophy Thesis, Chulalongkorn University.

Sriboonruang, K. (2014). *Model for Developing Leadership on Information and Communication Technology for Education of school Administrators Under Office of Basic Education Commission in The Northeast*. Doctoral of Educational Administration Thesis, Sakon Nakhon Rajabhat University.

Srisa-ard, B. (2002). *Statistical Methods for Research*. 2nd. Bangkok: Suwiriyasan.

Stogdill, R. (1974). *Handbook of Leadership*. New York: The Free.

Suksai, T. (2021). *Digital leadership model for basic school administration to conform the policy of Thailand 4.0.* Doctor of Education Thesis, Suan Dusit University.

Truelove, S. (1992). *Handbook of training and development*. Oxford: Blackwell.

Tawee-uthit, C. (2016). A Model for Instructional Leadership Development for Administrator at Secondary Schools Under the Office of the Basic Education Commission in the Northeast. *Journal of Educational Administration*, *12*(2), 55-65.

Yee, D. (2000) . Images of school principals' information and communications technology leadership. *Journal of Information Technology for Teacher Education, 9*(3), 287-302.

Walker, J. (2000). E-leadership?. *Human Resource Planning, 23*(1), 5-6.

Wanichbancha, K. (2011). *Advanced Statistical Analysis with SPSS for Windows*. 9th ed. Bangkok: Chulalongkorn University Press.

Webber, C. (2003) . New technologies and educative leadership. *Journal of Educational Administration, 41*(2), 119-123.

Wessels, P. (2005). Critical information and communication technology (ICT) skill for professional accountants. *Meditari Accountancy Research, 13*(1), 87-103.

Will, M. (1993). *Managing the training process: putting the basic into practice*. London: McGraw-Hill.

Willer, D. (1967). *Scientific Sociology: Theory and Method*. New Jersey: Prentice-Hall.

Wiriyajanya, S. (2016). *Model of The Development of Academic Leadership for Small-size School Administrators of Primary Educational Service Area Office in Nakhon Ratchasima Province*. Doctoral of Educational Administration Thesis, Nakhon Ratchasima Rajabhat University.

Wongsakul, S. (2011). *A Development Model of Effective Leadership for Change of The Basic Education Institution*. Doctoral of Educational Administration Thesis, Eastern Asia University.