An Effectiveness Model of Online Research-based Learning in Faculty of Education during Epidemic Situation of Coronavirus Disease 2019 (COVID-19)

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Abstract

The objectives of this research were 1) to study the phenomenon of online learning management of the Faculty of Education in the situation of COVID-19, 2) to analyze the effectiveness of learning management from using innovative learning activities, and 3) to create and validate a model of online research-based learning in Faculty of Education during epidemic Situation of COVID-19. Multiphase mixed methods research was designed. Sampling design consisted of 12 lectures from faculty of education and 180 students from graduate diploma program in teaching profession. Research tools were interview form, test, and assessment scale. Qualitative data was analyzed by analytic induction and quantitative research were anlyazed by descriptive statistic and to verify the validity of the Structural Equation Model (SEM). Results indicated that 1) the phenomenon of online learning management of the Faculty of Education in the situation of COVID-19. It is an online learning management using proactive learning according to New Normal that teachers must use their own potential in designing learning management that integrates knowledge in 3 areas: content knowledge, pedagogical knowledge integrating technological knowledge. 2) The effectiveness of learning management from using innovative learning activities can be measured from the learning management results. There are compositions that link to the effectiveness of research-based online learning management, consisting of (1) knowledge that is consistent with the learning content of the curriculum, (2) innovative design for use in online teaching and learning management, (3) express of teaching design with spirituality, and (4) able to organize learning activities that emphasize the process of reflection between learners and teachers. 3) A developed model of online research-based learning in Faculty of Education during epidemic Situation of COVID-19 was fit with the empirical data (Chi-square=64.48, df=64, p=.459, GFI=.946, AGFI=.840, RMR=.060). All variables in the model consisted of the learning material of the curriculum, teacher spirit reflexive skills and research-based online learning innovation. It can be explained the effectiveness of research-based online learning management by 84.4 percent, and when analyzing direct and indirect influences, interesting findings were showed that online research-based learning innovation and reflection skill as mediators between the learning content of the course and the effectiveness of online research-based learning management.

Keywords— Effectiveness Model, Online Research-based Learning, COVID-19

INTRODUCTION

From the phenomenon of the coronavirus epidemic 2019 has spread all over the world with data on December 31, 2019 in Wuhan City People's Republic of China. An outbreak of atypical pneumonia caused by Coronavirus 2019 (2019-nCoV) has been reported that has spread from other Chinese cities and has spread across the world as it appears in the current situation Subsequently. Data as of March 28, 2020 found that the number of infected people worldwide reached 597,267, and the United States had the

most cases at 104,126, followed by Italy, which had more cases. China Then Spain, Germany, France, Iran, England and Switzerland. This showed that the impact of the epidemic in Europe was spreading more and more. In Thailand, according to Dr. Taweesin Witsanuyothin, spokesman for the Center for the Coronavirus Disease Situation Administration 2019 (BDC), reported on the situation of the COVID-19 epidemic in Thailand, it was found that at the end of the month there were Na Khon 2020 has a continuous increase in the number of infected people. (Matichon Online: 29 March 2020) and 30 March 2020, there were still 136 new cases, totaling 1.524 people. From the data, it was found that the situation regarding the epidemic of the virus still shows no signs of stopping and continues to increase the number of patient statistics. From the phenomenon of each country to the daily news, there have been researches that create a body of knowledge on methods, measures, performance in preventing the spread of the coronavirus 2019, which is useful for monitoring and taking lessons from the experience of the area. As shown in the study by Shan-Lu Liu and Linda Saif [1] titled Emerging Viruses without Borders: The Wuhan Coronavirus, reflecting the results of the study. The newly emerging coronavirus in Wuhan, China claimed at least two lives as of January 17, 2020 and has infected hundreds. The situation has attracted international attention as well as the virology community. Rapid Publication of New Virus Genome Sequencing by Chinese Virologists, but it also believes that increased transparency in disease reporting and sharing of information with international colleagues is essential for curbing the global spread of the virus.

According to a study in Peng Shao's research on "Impact of city and residential unit lockdowns on prevention and control of COVID-19) [2], a management study that yielded results on the implementation of city lockdown measures led to to higher mortality in these cities due to reduced mobility. Moreover, the use of a closed-city system along with the addition of hospital beds resulted in better treatment and reduced

mortality. Strict action and premature closing of residential units. This made it effective in controlling the spread of disease and reducing the number of hospital beds. Overall, measures should be taken to lock down cities and homes to prevent the spread of COVID-19. Medical resources in closed cities should also be increased. Implementation of these measures will reduce the spread of the virus to other cities and provide appropriate treatment to patients in that city under the lockdown including at the work of the European Center for Disease Prevention and Control (2020) Novel coronavirus disease 2019 (COVID-19) pandemic: increased transmission in the EU/EEA and the UK [3] research by Shulin Liu, Zhi-gang Wang (Nankai University). , Hai-Yan Xie, An-An Liu (2020) on Single-Virus Tracking: From Imaging Methodologies to Virological Applications[4] and the work of Hui Luo, Qiao-ling Tang, Ya-xi Shang, Jian-Ping Liu (2020) [5] on the subject of Can Chinese Medicine Be Used for Prevention of Corona Virus Disease 2019 (COVID-19)? A Review of Historical Classics, Research Evidence and Current Prevention Programs, Be wary of the spread of the virus in China, Italy and the United States including seeking knowledge as a preventive measure Modeling is knowledge of virus propagation measures and prevention. All of which are actual overviews in the present world community. At the national level, the Prime Minister has announced the declaration of a state of emergency. In accordance with the Emergency Decree on Public Administration in Emergency Situations B.E. 2558, as announced in the Government Gazette, Volume 33, Part 24 Kor, dated March 25, 2020, referring to the approval of the Cabinet. At the meeting on March 24, 2020 [6] and at the recommendation of executives and academics in medicine and public health under the power of Section 5 of the Emergency Decree on Public Administration B.E. 2554 (2011) to declare a state of emergency in all local areas throughout the Kingdom. From 26 March 2020 until 30 April 2020, the aforementioned state of emergency has been declared in accordance with the existing law

since 2015 due to the current situation of spreading. The Coronavirus Disease 2019 (COVID-19) epidemic, a newly emerging pandemic, has spread rapidly around the world and Thailand has been affected as well. As a result of such measures, other mechanisms have been spread throughout the country, including universities, which are educational institutions that need to adapt to enable teaching and learning during the coronavirus disease 2019 (COVID-19) pandemic situation. At this time, surveillance of the epidemic is still needed and also affects the self-care of the person and organizational management of various departments across the country. For university, it is an educational institution that plays a major role in teaching and learning management, which when an outbreak of disease occurs. It affects the normal teaching and learning management which cannot be carried out according to traditional practices. Therefore, teachers need to adapt greatly by learning to make changes in teaching design and management to keep up with the epidemic situation that is currently unable to be prevented by vaccines. What can be done is to practice and carry out daily activities according to government measures by social distancing and adjusting lifestyle according to the new normal.
In the context of education management, online communication channels are involved and support the user's self-learning. This allows users to consider and choose according to their readiness and suitability in the context of that organization or school. It depends on the availability and accessibility of the system of the users and their stakeholders. When considering the management of basic education, the Ministry of Education has made preparations for learners before the start of the semester on July 1, 2020, which is a schedule that is delayed than last year due to the epidemic situation of the coronavirus disease 2019. (COVID-19) has prepared for the management of distance learning through DLTV, which can be learned from a television broadcast channel or via mobile applications. For schools that are ready for communication equipment Internet signal and online communication program will have online teaching activities using Google Meet or Zoom

Video Conference, which is an online learning channel that is essential to adapt and learn to use the system for teachers. Therefore, teachers are an important target group who need to be trained and learn to use this online teaching system in order to be able to apply it in a timely manner according to this situation.

The Faculty of Education is an educational unit at the university level that plays an important role in producing quality teachers and being able to manage teaching and learning in this era of change in a timely manner, being a teacher to the fullest potential alone. However, these graduates need the ability to quickly apply their knowledge to real-world situations. Student of the Faculty of Education will not only learn in a teacher's course or major to graduate, but the students of the Faculty of Education is necessary to have the ability to transmit academic subjects that are consistent with the various learning subject groups to learners at the basic education level as well. Therefore, the researcher interested in conducting research on "Research-Based Online Learning Management Effectiveness Model of Faculty of Education in the Coronavirus Disease 2019 (COVID-19) Epidemic". The study focuses on creative and proactive online learning management processes integrated with using research in order to increase the learning potential of students who need to study during the epidemic situation of the Coronavirus Disease 2019 (COVID-19) to be effective in accordance with the educational standards of the Faculty of Education and the Teachers Council of Thailand.

Research Objectives
The objectives of this research were 1) to study the phenomenon of online learning management of the Faculty of Education in the situation of COVID-19, 2) to analyze the effectiveness of learning management from using innovative learning activities, and 3) to create and validate a model of online research-based learning in Faculty of Education during epidemic Situation of COVID-19.

Research Method

Multiphase mixed methods research was designed. Sampling design consisted of 12 lectures from faculty of education and 180 students from graduate diploma program in teaching profession. Research tools were interview form, test, and assessment scale. Qualitative data was analyzed by analytic induction and quantitative research were anlyazed by descriptive statistic and to verify the validity of the Structural Equation Model (SEM)

Results

Results indicated that 1) the phenomenon of online learning management of the Faculty of Education in the situation of COVID-19. It is an online learning management using proactive learning according to New Normal that teachers must use their own potential in designing learning management that integrates knowledge in 3 areas: content knowledge, pedagogical knowledge integrating technological knowledge. 2) The effectiveness of learning management from using innovative learning activities can be measured from the learning management results. The ability to develop practical research in the classroom with knowledge and understanding, including the ability to formulate research titles related to research problems, able to set research objectives in accordance with research problems, able to design learning innovations that can be used to solve problems or develop learners can find the efficiency of innovation and can analyze data and interpret research results. There are compositions that link to the effectiveness of research-based online learning management, consisting of (1) knowledge that is consistent with the learning content of the curriculum, (2) innovative design for use in online teaching and learning management, (3) express of teaching design with spirituality, and (4) able to organize learning activities that emphasize the process of reflection between learners and teachers. 3) A developed model of online research-based learning in Faculty of Education during epidemic Situation of COVID-19 was fit with the empirical data (Chi-square=64.48, df=64, p=.459, GFI=.946, AGFI=.840, RMR=.060). All variables in the model consisted of the learning material of the curriculum, teacher spirit reflexive skills and research-based online learning innovation. It can be explained the effectiveness of research-based online learning management by 84.40 percent, and when analyzing direct and indirect influences, interesting findings were showed that online research-based learning innovation and reflection skill as mediators between the learning content of the course and the effectiveness of online research-based learning management. Analysis results were shown in table 1 and figure 1.

Table 1 Statistical analysis of correlation between latent variables and effect of An Effectiveness Model of Online Research-based Learning in Faculty of Education during Epidemic Situation of Coronavirus Disease 2019 (COVID-19)

Effect variables	INNOVAT			EFFECT		
Causal variables	TE	IE	DE	TE	IE	DE
CONT	.715** (.083)	-	.715** (.083)	.804** (.096)	.701 (.451)	.103 (.451)
INNOVAT	-	-	-	.628** (.094)	-	.628** (.094)
SPIRIT	-	-	-	.123* (.062)	-	.123* (.062)
REFLECT	-	-	-	.356 (.450)	-	.356 (.450)

Effect variables	SPIRIT			REFLECT		
Causal variables	TE	IE	DE	TE	IE	DE
CONT	.830** (.087)	-	.830** (.087)	1.000** (.094)	-	1.000** (.094)

Statistics	$\chi^2 = 64.48$, df = 64, p = .459, GFI = .946, AGFI = .840, RMR = .060					
Variable	CONT1	CONT2	CONT3	CONT4	CONT5	SPIRIT1
Reliability	.626	.714	.916	.842	.702	.750
Variable	SPIRIT2	SPIRIT3	REFLECT1	REFLECT2	REFLECT3	INNOVAT1
Reliability	.900	.944	.618	.669	.842	.834
Variable	INNOVAT2	INNOVAT3	EFFECT1	EFFECT2	EFFECT3	EFFECT4
Reliability	.717	.755	.614	.912	.781	.852
Variable	EFFECT5					
Reliability	.809					

Structural Equation of Variables	SPIRIT	REFLECT	INNOVAT	EFFECT
R SQUARE	.688	1.000	.511	.844

Correlation Matrix between latent variables

Latent Variables	SPIRIT	REFLECT	INNOVAT	EFFECT	CONT
SPIRIT	1.000				
REFLECT	.830	1.000			
INNOVAT	.593	.715	1.000		
EFFECT	.705	.804	.882	1.000	
CONT	.830	1.000	.715	.804	1.000

Note : Numbers in parentheses is standard error value , **p < .01, *p < .05

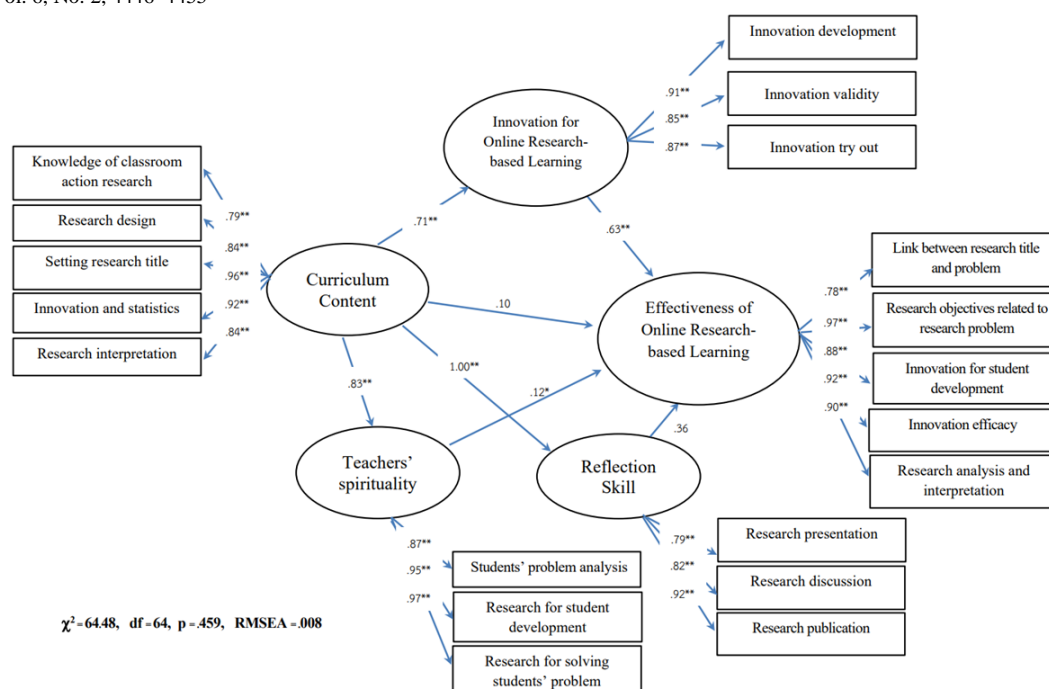TE = Total effects, IE = Indirect effects, DE = Direct effects

Figure 1 An Effectiveness Model of Online Research-based Learning in Faculty of Education during Epidemic Situation of Coronavirus Disease 2019 (COVID-19)

Discussions

From research results, the researcher summarized the key points in the discussion of the results, divided into 3 issues according to the research results as follows:

The first point, from the research findings, found that the phenomenon of online learning management of the Faculty of Education in the situation of the coronavirus disease 2019 (COVID-19) epidemic will be online learning management using proactive learning according to New Normal. Teachers must use the potential of self in designing learning management that integrates knowledge in 3 areas, comprising content knowledge, pedagogical knowledge, integrating technological knowledge to use in teaching and learning to be effective. The results of this research are consistent with Thapanee Thammametha [7] in the research on "Guidelines for developing teachers to prepare for open online teaching for the masses in higher education institutions" reflecting the results of the study that evaluate teacher development guidelines for preparing for online teaching for the masses. The results of the assessment certify guidelines for teacher development for preparing for teaching mook in higher education institutions for concrete implementation and in line with Monchai Thienthong [8], the development of an online teaching and learning management system: K-LMS. The results showed that the K-LMS lesson management system developed was effective at a good level (Average over 4.00 in all aspects). It can be concluded that the K-LMS online teaching and learning management system developed can be used to manage teaching by e-Learning within the e-Learning Center of King Mongkut's Institute of Technology North Bangkok properly. It can also be used to manage distance learning through the internet in other organizations as well.

The second point, from the results of the research, it was found that the effectiveness of learning management through the use of innovative, research-based online learning activities of the Faculty of Education in the situation of the coronavirus disease 2019 (COVID-19) epidemic can be measured from the learning management outcomes that learners are concerned about. The ability to develop practical research in the classroom with knowledge and understanding, including the ability to formulate research titles related to research problems, able to set research objectives in accordance with research problems, able to design learning innovations that can be used to solve problems

or develop learners. It can find the efficiency of innovation and can analyze data and interpret research results. The results of this research were consistent with the research of Jatuphum Khetchuturat [9] to develop research ability of graduate students which provides information in the study that 1) students have the ability to conduct research in educational administration which has research learning outcomes research work skills and research quality meet the assessment criteria in all dimensions. It's at a fair to very good level. The students had research learning outcomes that related to research skills and research quality. 2) The students' opinions on various issues in the research-based teaching and learning activities were at the highest level. The key findings are students develop a systematic thinking process, analytical thinking, critical thinking, creative problem solving collaborative working together with research creativity and sharing knowledge and experiences from this research to friends, community, society, related to the research of Jutathip Itthichinaphat proposed Piromjitpong Nattakit Sawatthaisong in research on a research-based teaching-learning management model to develop numerical analysis skills, communication and using information technology, Faculty of Education, Rajabhat University [10]. The results of the study revealed that: 1. The condition of teaching and learning by using research as a base revealed that the overall aspects. They had the highest level of practice (Mean = 3.56, SD = 0.50) and the level of success was high (Mean = 3.49, SD = 0.65). When considering skills, it was found that the overall, the use of research process as part of learning activities to develop desirable graduate skills (the fifth skill is numerical analysis skills, communication, and information technology use), with the highest practical level (Mean = 3.84, SD = 0.74) and has a high level of success (Mean = 3.14, SD = 0.67). It has 5 components: problem determination, design, data collection and analysis, summarization, and application of the results base research by experts found. The developed model was appropriate at a high level (Mean = 3.50, S.D. = 0.52).

The third point, from the results of the research, it was found that the developed effectiveness model of online research-based learning of Faculty of Education in the Coronavirus Disease 2019 (COVID-19) epidemic situation fit with empirical data and the interesting finding was Online research-based learning innovation was a mediator between the learning content of the course and the effectiveness of the research-based online learning management. The results of this research realted to Jirapha Attaporn, Prakob Koraneekij, studied on the development of an online proactive teaching model to promote learning behaviors of graduate students [11] or in the research work of Nammon Ruangrit has studied the condition and the need for online learning resources in an open system for the public. "Educational Science/Educational Science" [12] in the research of Somachai Bunyanan [13] in the research titled "Using online social networks to support art learning management for learners in the age of 4.0." It was also related to the research of Ploynutcha Dechasetsiri on a study of learning achievement in modern leadership and management course by using online electronic lessons [14], with related to the research of Rungrutthanan Bunyarak, Paitoon Sinlarat, and Pongsin Wisetsiri in their research on Strategies for managing creative online social cooperation in education for private kindergarten schools in Bangkok [15]. Overall, the findings reflect similar research findings. Summarized in general that research-based learning results in innovative learning including empirical learning with the use of online systems as an important aspect of learning. Therefore, it can be regarded as a channel and the innovation of learning is therefore important and is an important necessity. It appears as an online proactive teaching model to promote learning behaviors with the process consisted of 1) research stage, 2) problem association stage, 3) brainstorming stage, 4) observation stage, and 5) reflection stage. It related to the modern fast learning channel as knowledge was open and accessible through modern devices such as smart phones and tablets. The characteristics of learners have changed and be a learner who is familiar with digital technology into a strategy

aiming to change to the era of sharing social value in education integrating, creating and implementing professional social media plans to a joint strategy in order to enhance knowledge through different dimensions of people according to the framework and goals of this research study.

Conclusion

The study of the effectiveness model of online research-based learning in Faculty of Education during epidemic Situation of COVID-19, results of study showed that the phenomenon of online learning management of the Faculty of Education in the situation of COVID-19. It is an online learning management using proactive learning according to New Normal that teachers must use their own potential in designing learning management that integrates knowledge of content knowledge, pedagogical knowledge, and technological knowledge. The effectiveness of learning management from using innovative learning activities can be measured from the learning management results. There are compositions that link to the effectiveness of research-based online learning management, consisting of knowledge that is consistent with the learning content of the curriculum, innovative design for use in online teaching and learning management, express of teaching design with spirituality, and able to organize learning activities that emphasize the process of reflection between learners and teachers.A developed model of online research-based learning in Faculty of Education during epidemic Situation of COVID-19 was fit with the empirical data. All variables in the model consisted of the learning material of the curriculum, teacher spirit reflexive skills and research-based online learning innovation. It can be explained the effectiveness of research-based online learning management by 84.40 percent, and when analyzing direct and indirect influences, interesting findings were showed that online research-based learning innovation and reflection skill as mediators between the learning content of the course and the effectiveness of online research-based learning management.

Results can apply for further development of teaching and learning in faculty of education.

Recommendations
A. Recommendation for applying into practices
1) From the findings, it can be seen that innovation is a mediator in the development of management skills in teaching during the COVID-19 epidemic situation to be effective in learning management through innovations developed using research as a base for designing learning management on the online network. It will be a model for various educational institutions that can be adapted to suit the level of learning management to be effective for learners.
2) From the study, it was also found that in organizing learning activities during the COVID-19 epidemic. It is necessary to design learning management that focuses on the process of reflection during teaching and learning on the online network in order to allow learners to interact in interactive sessions during lectures or organize activities to be interesting. For the learners, as well as the friendliness of the teachers, it is important that the organization of online learning activities is successful and attracts the attention of learners to follow and learn throughout the course of teaching and instruction.

B. Recommendation for further research
1) In this research, the researcher studied in the context of teaching and learning management of research courses for the development of learning among students in the Graduate Certificate in Teacher Professions who are students in higher education. For further research, researcher can choose to study in a sample group with different educational levels and study ages in order to explore the effectiveness of innovative online learning management in different groups.
2) In this research, the researcher designed learning management by developing innovations on online networks and experimenting with students studying during the Covid-19 epidemic situation. For further research, researcher can

design by using action research when teaching in the area with blended learning.

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