



รูปแบบศูนย์การเรียนรู้ชุมชนเสมือนภายใต้แนวคิดปรัชญาของเศรษฐกิจพอเพียง
โดยใช้กรณีศึกษาเป็นฐาน เพื่อเสริมสร้างความสามารถในการแก้ปัญหาของนิสิตปริญญาบัณฑิต

Virtual Community Learning Center Based on the Philosophy of Sufficiency
Economy with Case Based Learning to Enhance Problem Solving Ability of
Undergraduate Students

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บทคัดย่อ

การวิจัยนี้มีวัตถุประสงค์เพื่อ 1) ศึกษาความต้องการของนิสิต อาจารย์ผู้เชี่ยวชาญการสอนสาขาเกษตร และสาขาสื่อการสอนและเทคโนโลยีการศึกษา เกี่ยวกับสภาพปัญหาและความต้องการที่มีต่อการจัดการเรียนการสอน และ 2) เพื่อออกแบบศูนย์การเรียนรู้ชุมชนเสมือนภายใต้แนวคิดปรัชญาของเศรษฐกิจพอเพียง กลุ่มตัวอย่างคือ นิสิตระดับปริญญาบัณฑิตสาขาเกษตร จำนวน 400 คน โดยใช้แบบสอบถามเก็บข้อมูลกับนิสิต และใช้แบบสัมภาษณ์กึ่งโครงสร้างกับอาจารย์สาขาเกษตร จำนวน 9 คน และอาจารย์สาขาสื่อการสอนและเทคโนโลยีการศึกษา จำนวน 5 คน วิเคราะห์ข้อมูลโดยใช้สถิติเชิงบรรยาย ได้แก่ ค่าความถี่ ร้อยละ และค่าเฉลี่ย ผลการศึกษาพบว่า ปัญหาของนิสิตคือ สื่อการเรียนรู้ไม่เพียงพอ ร้อยละ 55.8 ความรู้ที่ต้องการพัฒนามากที่สุดคือ ด้านการเกษตร และการคิดแก้ปัญหา ร้อยละ 74.3 และ 68.8 ตามลำดับ ปัญหาที่เป็นอุปสรรคของอาจารย์ คือ ภาระงานมากเกินไปทำให้ไม่มีเวลาพัฒนาตนเอง ส่วนการออกแบบศูนย์การเรียนรู้ชุมชนเสมือน ได้ประมวลผลข้อมูลจากแบบสอบถามและแบบสัมภาษณ์กึ่งโครงสร้างจากกลุ่มตัวอย่าง เพื่อนำมาสร้างรูปแบบโดยมี 5 องค์ประกอบ คือ คน เทคโนโลยี แหล่งเรียนรู้ กิจกรรม/ กระบวนการเรียนรู้ และการประเมินผล ส่วนกิจกรรมการเรียนรู้ มี 4 ระยะ คือ การเตรียมความพร้อมผู้เรียน การทดสอบก่อนเรียน การจัดกิจกรรมการเรียนรู้ และการประเมินผล ซึ่งรูปแบบดังกล่าวนำไปสู่การพัฒนาเครื่องมือและกิจกรรมการเรียนรู้ของศูนย์การเรียนรู้ชุมชนเสมือนต่อไปในอนาคต

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Abstract

The objectives of this research were to: 1) Study the needs of students, agriculture teaching specialists, media and educational technology experts regarding their problems and needs for learning and teaching agriculture; and 2) Design a Virtual Community Learning Centre (VCLC) model under the philosophy of a sufficiency economy. The samples consisted of 400 undergraduate students studying at agriculture institutes, and questionnaires were used to collect data. Semi-structured interviews from nine agriculture specialists, and five lecturers in teaching media and technology were also used as research tools. The descriptive statistics, including frequency, percentage and mean, were used to analyse the data. The results indicated problems which impeded student learning which were primarily due to inadequate learning media (55.8%). The most basic of proficiencies that students needed to develop were knowledge of agriculture and problem-solving skills, at 74.3% and 68.8%, respectively. The most significant teaching and learning obstacle experienced by most lecturers was identified as an excessive workload which adversely limited their time and opportunity for self-development. The VCLC model evaluated from the students' questionnaires, together with the previously-described semi-structured interviews to create the model, consisted of five key elements, namely: People, technology, learning resources, activity/learning process and evaluation, while the learning activity consisted of four phases: Preparation of learners, pre-tests, learning activities and evaluation. This designed model could lead the way to the future development of learning tools and activities for the VCLC.

Keywords: virtual community learning center, sufficiency economy, case study, problem solving ability

Introduction

The 12th National Economic and Social Development Plan (2017-2021) is the master plan for national development and aims to achieve sustainable development goals (SDGs). "sufficiency economy philosophy" is a guiding philosophy in the country's continued development from 9th-11th National Economic and Social Development Plan to enhance the immunity and strengthen for Thai society. These result in balanced, prosperous, and sustainable of the country development (Office of the National Economic and Social Development Board, 2016). Educational management for enhancing the quality

of life that is environmentally friendly and development of digital technology to give Thai people a chance to learn continuously throughout their lives by using information technology that responds to developments in access to equality, services and efficiency (Office of the Secretary of the Council of Education, 2017). The students in digital generation expect to use academic resources; therefore, the development of social networks and the more widespread use of mobile devices are able to take on more challenging assignments which require continual and immediate feedback. This contrasts with traditional and conventional teaching methods which do not allow for such feedback, making them less effective in this respect (Khlaisang & Songkram, 2013). In addition to the virtual multidisciplinary learning communities can become an important resource helping school teachers and students to foster a culture of communication, problem solving, and technology integration (Freiman & Lirette-Pitre, 2008). Furthermore, virtual learning environment (VLE) enhances creativity, problem solving skills, communication, and collaboration skills through the exchange of ideas, sharing of thoughts, and shared discovery, rather than through individual achievement learning alone. Online active learning and online activities-based learning have come to play a vital role in higher education, and have proven to not only enhance student's attention, but also improve a broad range of twenty-first century skills (Khlaisang & Songkram, 2017). Problem-solving to inform design of case-based learning environments for teaching and learning network.

Jonassen (1997, cited in Cifuentes et al. 2010) mentioned that case-based learning was chosen as the instructional approach because novices needed to learn how to gain and refine their ability at solving real-world cyber security problems. Constructivist learning theory suggests that such problem-solving is best learned in the context of problem, project, or case-based learning

environments, which provide experiences that facilitate knowledge construction. Chang (2008) found that the students thought the problem-solving tests are “more related to thinking activities” and that both domain specific knowledge and reasoning skills play important roles in students’ problem-solving ability. Therefore, the community learning center emerging from the community that realizes the importance of exchanging learning, inheritance, experience, wisdom, culture, social values, identity and community. It is a public center operated by the people in the community for the strength of sustainable community (Khlibtong, 2011). Developing of teaching and technology delivery knowledge developed from text-based learning to multisensory learning environment, which gives students and teachers the opportunity to do research and use communication through these tools for all location and time via one-to-one, one-to-many, many-to-many and standalone communications (Sharma et al., 2005).

New teaching styles that always respond to change the social/economic on the knowledge-based society/economy, focuses on the availability and utilization of information using computer technologies, internet and related telecommunications technologies (Laohajatsang, 2009) and the online community. It is one of the most effective online content presentations (Palloff & Pratt, 2007) because of the flexibility of place and time (anywhere, anytime) and respond to learner styles for learning community. Barker et al. (2013) reported that the virtual learning community supports the collaborative learning by using technology to enhance learning and teaching process. These systems support hardware, software, content and training by providing services on web-based courses, telecourses, interactive videos and hybrid courses. This research aims to study problems and needs of the students and lecturers on agricultural learning, learning process, learning activities measurement and evaluation in

order to design the VCLC model under the concept of sufficiency economy philosophy for solving the problems.

Objectives

1. To study needs of students, agricultural teaching specialists, media and educational technology experts concerning their problems and needs for teaching and learning in agriculture.

2. To design virtual community learning center model under the philosophy of sufficiency economy with case-based learning to enhance problem solving ability of undergraduate students.

Methodology

Research procedure was divided into 2 phases.

Phase 1: Study the student's problems and needs toward teaching and learning, and interview agricultural teaching specialists, media and educational technology experts.

The data were collected from the questionnaires which divided into 3 parts, 1) general information, 2) students' opinions about the problems in teaching and learning in the curriculum and 3) students' opinions on the VCLC activities and concept of sufficiency economy philosophy, using case studies as a base to enhance the problem-solving ability of the undergraduate students. The semi-structured interviews were also used to collect data from agricultural specialists and lecturers in teaching media and technology. The interview structure was divided into 3 parts. 1) general information of experts, 2) the opinions about the problems in teaching and learning in the curriculum (curriculum, teacher and learner, teaching media and learning resources and evaluation) and 3) recommendation on the VCLC model.

Quality of tools was evaluated by 3 educational technology specialists who examined content validity by using the index of item-objective congruence (IOC). The average content validity was 0.79, which was in the appropriate level (Fongsri, 2011).

Phase 2: Presentation of the VCLC under the concept of sufficiency economy philosophy using case studies as a base to enhance the ability to solve the undergraduate student's problems.

The data collected from the questionnaires and semi-structured interviews from Phase 1 were also used to evaluate and create the VCLC model. There were 5 educational technology experts selected from purposive sampling method used for quality assessment the VCLC model. The quality of media design for VCLC management consists of 3 parts: content, system/screen design and learning activities. The quality assessment of experts found that the appropriate of the VCLC model learning process and teaching activities was very good (4.59) and could be used to promote the problem-solving ability of graduate students.

Sampling and Data Collection

Samples used in this research were:

1. Undergraduate students studying in agriculture in the academic year 2015 from 10 institutes: Chiang Mai University, Maejo University, Naresuan University, Suranaree University of Technology, Khonkaen University, Silpakorn University Phetchaburi IT Campus, Walailak University, Prince of Songkla University, Kasetsart University and King Mongkut's Institute of Technology Ladkrabang. The totals of 15,000 undergraduate students from 10 institutes were determined the sampling size using Krejcie and Morgan table (Fongsri, 2011). Four hundred student's questionnaires were collected for evaluating the data.

2. Lecturers (9 agricultural teaching specialists) from 9 institutes: Chiang Mai University, Maejo University, Naresuan University, Suranaree University of Technology, Khonkaen University, Silpakorn University Phetchaburi IT Campus, Walailak University, Kasetsart University and King Mongkut's Institute of Technology Ladkrabang. The selection expert criteria were the instructors that had an experienced in teaching and learning, writing textbooks or conducted research in the field of agriculture and their works were acceptable. Research data were determined via a semi-structured interview.

3. Five lecturers in teaching and technology from 5 institutes: Chulalongkorn University, Sukhothai Thammathirat Open University, Prince of Songkla University, Burapa University and King Mongkut's University of Technology North Bangkok. The selection expert criteria were the instructors that had an experience in teaching media and educational technology, writing textbooks or did research on teaching media and educational technology which was recognized in the field of education. Data were collected using a semi-structured interview.

Data were analyzed by using frequency, percentage, mean, and content analysis.

Research Findings

Phase 1: Study the student's problems and needs toward teaching and learning, and interview the agricultural teaching specialist, media and educational technology expert.

1.1 General information

The undergraduate students were female, 70.8% and 29.2% were male. The average age was 20.5 years. Percentage of using Facebook, E-mail, YouTube and Line were 97.3%, 93.8%, 91% and 87.5%, respectively, with the

use of the 89.0% internet via smartphones and 85.8% by notebook/MacBook. Seventy-four percentages of the students spend the time for internet access at 17.00 - 24.00. Most of them, 85.5% using internet in dormitories.

1.2 The student's opinions on the problems in teaching and learning in agriculture.

The opinions of students on the problems in agricultural teaching and learning were divided in 3 aspects: curriculum, instructional activities and supporting media (Table 1) as follows:

The curriculum aspect, the opinions of students on the curriculum purpose was provided knowledge (62%), interpersonal skills and responsibility (32.3%), intellectual skills (31.3%) and ethics (31.3%). Mostly students prefer learning in groups with friends (64.8%) and 45.3% was self-learning by interesting. For teacher role, the comment from the students indicated that the teacher had taught and advised students 81.3% and recommended the searching methods and learning (58.8%). The students prefer visiting the community learning center (65%) and government agencies (39.5%). The problems that hinder student learning were inadequate learning media (55.8%), followed by insufficient supporting staff (43.5%), and 38.5% were the learning media is not up to date.

The instructional activities aspect, most of students were interested in doing experiment (66.5%) followed by field trips (66%) and preferred the instructional activities style appropriate to the learner (68.8%) and able to apply knowledge to careers (56.3%). The most important instructional activities were stimulated students to prepare their studies (67.3%) and reviewed the knowledge that they had before connecting to new knowledge (57%). Most students preferred practice more than memorization (64.5%) and interested in group working more than doing alone (47.8%).

The supporting media aspects, most of students used learning resources from library or information technology center and internet and website as 78.3% and 70.8%, respectively. Mainly use the internet for searching data (82.5%), sending homework or report (73%) and communicate with friends (60%). Learning tools and equipment were purchased by most students, from family and students themselves as 80.8% and 41.8%, respectively. The most obstacles in learning media were caused by inadequate learning media resources (37.5%). Secondly, the internet system service did not cover the teaching area (32.5%) and 30.5% was lacking the media/learning support tool.

Table 1

The student's opinion on the problems effect teaching in the curriculum. (n = 400)

Problems in teaching and learning in the curriculum	Number	Percentage
1. Curriculum		
1.1 The aim of curriculum for students to have*		
Knowledge	248	62.0
Intellectual skills	138	31.3
Interpersonal skills and responsibility	129	32.3
Ethics	125	31.3
1.2 Learner's role*		
Groups Learning	259	64.8
Self-learning by interesting	181	45.3
Choose content based on interesting	171	42.8
Independent opinions	140	35.0
1.3 Teacher role*		
Teacher and mentor	325	81.3
Recommendation the searching methods and learning resources	235	58.8
Guiding and adviser	223	55.8

Table 1 (cont.)

The student's opinion on the problems effect teaching in the curriculum. (n = 400)

Problems in teaching and learning in the curriculum	Number	Percentage
Facilitate and organize learning experiences for learners	194	48.5
1.4 Visiting*		
Community learning center	260	65.0
Government agencies	158	39.5
Private sector	151	37.8
Exhibition/ Fair	148	37.0
1.5 The most problem for students*		
Inadequate learning media	223	55.8
Inadequate supporting staff	174	43.5
Learning media is not up-to-date	154	38.5
2. Instructional activities		
2.1 Teaching and learning type*		
Experiment	266	66.5
Field trips	264	66.0
Lecture	224	56.0
Demonstration	172	43.0
2.2 Instructional activities style appropriate to the learner*		
Learning styles	275	68.8
Applying knowledge to the career	225	56.3
Tools or learning materials	200	50.0
Environment	194	48.5
2.3 The most important step in teaching and learning*		
Stimulating students to prepare their studies	269	67.3
Reviewing the knowledge before connecting to new knowledge	228	57.0
Presenting new knowledge using the appropriate teaching methods for learners	200	50.0

Table 1 (cont.)*The student's opinion on the problems effect teaching in the curriculum. (n = 400)*

Problems in teaching and learning in the curriculum	Number	Percentage
Informing the learning objectives to learners	190	47.5
2.4 Students learning behavior*		
Prefer practice more than memorization	258	64.5
Prefer group working more than doing alone	191	47.8
Prefer doing alone more than group working	174	43.5
Prefer doing laboratory/practice	129	32.3
3. The supporting media		
3.1 Learning resources*		
Library or information technology center	313	78.3
Internet and website	283	70.8
Community learning center	138	34.5
Exhibition / Academic conference	135	33.8
3.2 The using internet aim for learner*		
Searching data	330	82.5
Sending homework or report	292	73.0
Communication with friends	240	60.0

Note. choose 1 or more.

1.3 The opinions of students toward the virtual community learning center under the philosophy of sufficiency economy using case study as a base to enhance the problem-solving ability of undergraduate students.

The virtual community learning center (VCLC) model should have intensive course description (62%), accurate instructional plans (59%), learning resources linking together (50.5%), and having the examples or case studies for learning easier (50.5%) (Table 3.). The case study based on the sufficiency economy philosophy to enhance problem solving ability of the students, they

selected mostly reasonableness (77.3%) followed by moderation (68.8%) and 52.3% was risk management. The most basic knowledge that agricultural students needed to develop was agricultural knowledge (74.3%) and knowledge to solve problems (68.8%) and they preferred group working, selected by themselves more than pair form for case studies-based learning type to develop students' problem-solving abilities. The case studies should concern the lifestyle and actual events as 67.3% and 58.3%, respectively. Mostly students preferred the instructor's suggestions when they had problems (45.5%) but 32% needed the advice when they were requested. In addition, besides the instructor, the students needed the expert (46.8%) as the evaluator and self-assessment along with the instructor. The virtual community learning center services should provide online learner services (54.3%), students guideline (54%) and graphic organizers (40.8%). The appropriate time for learning activities to improve student problem solving ability should be 3-4 weeks, followed by 1-2 months, respectively.

1.4 The opinions of agricultural teaching specialists and media and educational technology experts on the virtual community learning centers model under the philosophy of sufficiency economy using case studies as a base to enhance the ability to solve agricultural problems of undergraduate students.

The opinions of agricultural teaching specialists and media and educational technology experts from semi-structured interview were divided in 6 aspects: curriculum, teacher and learner, teaching and learning activities, media and learning resources, measurement and evaluation, and the virtual community learning center (VCLC) were described as follows:

Curriculum aspect, VCLC model should be online lesson, teaching used case studies or simulation, learning media through the internet and using

case-based learning (CBL) activities to strengthen agricultural problem-solving capabilities. Focusing on learner preparation before learning, case studies selection and learning, problem analysis, selection of problem-solving methods and discussion and conclusion were very importance. The selection of case studies based on the philosophy of sufficiency economy to enhance students' ability to solve agricultural problems, the learner should be intensive on reasonableness, virtue and moderation. The basic components needed to develop problem solving abilities should be knowledge-based problem solving, sufficiency economy philosophy, basic knowledge of agriculture, information technology knowledge and good relationship.

Teachers and learners, teaching preparation mostly searching through the internet using online academic journal/research database, journal publication in libraries, information centers, and textbooks. The teaching and learning obstacles of mostly teachers were too much workload affect the time to develop themselves. In addition, they had the others workload besides over-teaching such as administrative tasks and curriculum management. The results of instructors' role in learning activities, providing guidance, advisory, and problem solving from student requests, show the most learners prefer not to ask the questions, comments and writing but they prefer group working rather than working alone. The students prefer doing laboratory or practice more than memorization and favor the new instructional media technology.

Teaching and learning activities, for teaching activities, teachers should consider the course objectives, techniques and teaching methods appropriated to learners, measurement and evaluation, teaching and learning activities and media. In the process of stimulating the learner's attention learning activities should focus on making learning easier, informing students about their learning objectives, reviewing previous knowledge before receiving new

knowledge and stimulating the learners to respond the questions such as answer the question or practice. The CBL intended to enhance the ability to solve agricultural problems. It was important to focus on the preparation process before class, case selection, problem analysis, problem solving, discussion and conclusion. Students must have basic knowledge in problem solving, agricultural knowledge and philosophy of sufficiency economy. The case study used should be the actual event about the lifestyle for the strengthening of the community. The important source of learning should be an online academic database, community-based learning centers and lecturers in the curriculum. Students management should be arranged in groups by themselves.

Media and learning resources should be used in VCLC such as computer with network, an interesting online agricultural database which easily access and interact with users. Media include e-mail, search engine, Facebook, YouTube, web board and weblog were recommended in VCLC.

Measurement and evaluation should focus on the learning development, success of work, intellectual skills, attention and participation in learning and achievement using self-assessment, work evaluation and the instructor was the evaluator. The tools used to measure and assess the ability to solve agricultural problems should use the success of work, multiple choice examination and group operations process.

The VCLC model should provide online learners. There was a guideline and helping system, graphic organizers, and a virtual learning environment was organized, and case studies were implemented appropriately to encourage and support learners in problem solving. Learning resources were shared. In addition, VCLC should have the synchronous discussion tool and asynchronous discussion, message boards, group discussions and tracking system. Student tools used were calendars, blog, online assessment, technology and

communication tools including internet and website, social media, database, journal/online research, case study, community sage, community learning center and electronic books. Technology in these systems should use technology that was easy to use, user friendly, cloud computing technology that can link resources on the network to learn and respond to the interaction and feedback. Learning management system (LMS) was not complicated but encouraged student's learning. Integration technology was appropriate for work using open software that was easy to access and manage. In terms of communication and knowledge sharing, web boards and chat rooms should be used to communicate between the instructor and the learner or among learners. The appropriate duration of study was 3-4 weeks. For learning activities supporting personnel, should be taught by the instructor, agricultural expert or community sage.

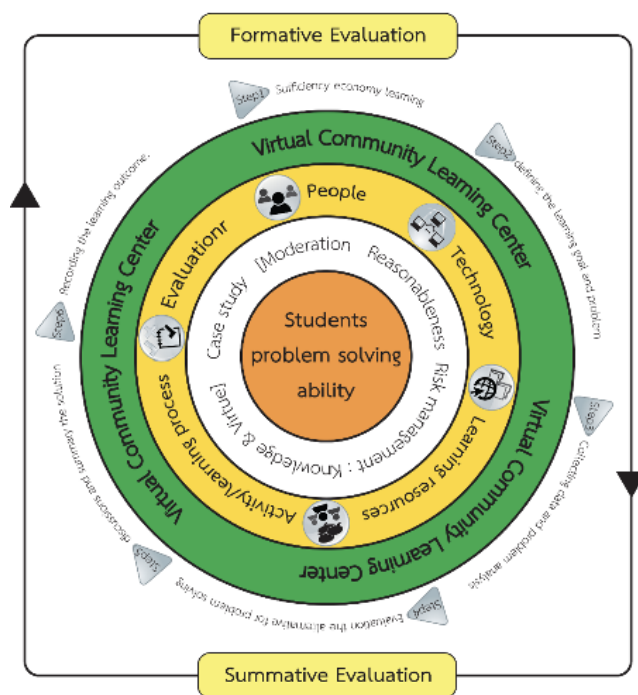
Phase 2: Virtual community learning center model under the concept of sufficiency economy philosophy using case studies as a base to enhance the ability to solve the undergraduate student's problems.

The virtual community learning center (VCLC) model under the sufficiency economy philosophy using case studies as a base to enhance the problem solving ability of undergraduate students consists of 5 major elements: (1) people, (2) technology, (3) learning resources, (4) activity/learning process and (5) evaluation based on the concept of sufficiency economy philosophy including moderation, reasonableness and risk management with knowledge and virtue using case studies as a learning activities to enhance the ability to solve the undergraduate student's problems. This model was driven with 6 steps of learning activities: step 1: sufficiency economy learning, step 2: defining the learning goal and problem, step 3: collecting data and problem analysis, step 4: evaluation the alternative for problem solving, step 5: discussion and summary the solution and step 6: recording the learning outcome. The formative

evaluation was improved during the model development, and final assessment was summative evaluation for deciding the quality of learners and model (Figure 1). The VCLC model was described as follows.

Figure 1

Virtual community learning center instructional model



The VCLC circle was built on the principle of a community learning center, combined with the use of software and internet to enhance the learning potential, using Moodle platform as the basis for the development of the VCLC website, <http://agrivclc.com/elearning> (figure 2). The structure of the center consists of learning management system (LMS) that had a log-in system, a user profile, blog and community learning for talking, comment, discussion or exchange between teacher and learner or among learner such as chat and forum. Moreover, the VCLC include the case studies, learning resources and evaluation system.

Figure 2

Virtual community learning center website



The element of learning within the center consists of 5 elements; people, technology, learning resources, activity/learning process and evaluation. The instructor, expert and community sage were concerned about guiding to the learning process and assisting learners when they requested through the learning community. The learning process was divided into 4 phases; students' preparation, pre-test, learning activities (6 steps), and evaluation. The students learned through the VCLC learning resources, which were a source of knowledge, information, including content, lessons, sufficiency economy and case study presented as motion graphics and online video. These would be provided the learner opportunity to self-study via job assignment and activity/learning process for enhancing student's ability to solve problems. The inner circle showed the knowledge about the case study of the VCLC under the concept of sufficiency economy philosophy. It consisted of moderation, reasonableness, and risk

management under knowledge and virtue conditions that was the basis of making decision. This is the heart of VCLC learning process, leading to the ability to continue to solve problems for students. The VCLC model assessment was developed and improved during the development using formative evaluation. Finally, the summative evaluation was used to decide the learner's quality and the VCLC learning model.

Discussion

The opinion of students, agricultural teaching specialist, media and educational technology expert had the consistent opinions that the basic knowledge of agricultural students should have the agricultural knowledge, problem solving ability and the philosophy of sufficiency economy. Sufficiency economy was a philosophy that His Majesty the King Bhumibol Adulyadej (the King Rama IX), initiated more than 30 years ago. It is an idea based on the fundamental of Thai culture. It is a method of development based on the middle path and prudence, moderation, reasonableness, and an internal risk management, one that uses knowledge and virtue as guidelines in living. Significantly, there must be intelligence and perseverance which will lead to real happiness in leading one's life. (The Chaipattana Foundation, 2007). It also found that information on the use of electronic media for learning of students and teachers were consistency in the use of internet and web-based tools; e-mail, Facebook, YouTube, search engine, web-board and blog that was corresponded to the report of Statista (2017) which surveying the social media application on internet in Thailand in 2016 was found that 67% of the population were active social media users. The most popular social network was Facebook (65%) and YouTube with a 64% penetration rate. Moreover, internet users surveyed around the world have shown rapid growth with more internet users

10% (350 million) in 2016 and the number of internet users reached 3.77 billion in 2017 (Kemp, 2017). Nowadays, internet and social media trend to use anytime, anywhere; therefore, the development VCLC model under the concept of sufficiency economy philosophy using a case study as a base to enhance problem solving ability for undergraduate students was introduced the agricultural knowledge of the community learning center combined with computer technology and internet to use for learning and increasing the educational equality opportunities. (Ministry of Education, 2017). This VCLC developed using Moodle platform as a development base which corresponded to Sriarunasmee et al. (2015) were studied a learning model using virtual field trips (VFTs). In addition, Khlaisang and Koraneekit (2016) had divided the web design components into four main areas: 1) e-learning courseware, 2) learning management system, 3) communication and 4) evaluation that concerning with this research. Moreover, Khan (2005) mentioned the e-learning management referred to managing various stages of e-learning process including, design, production, evaluation, delivery and maintenance.

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