Development of a Model for Knowledge Management of Local Wisdom via Virtual Learning Community for Instructional Management

Taweewat Watthanakuljaroen

***Abstract*—In a world that has become digital transformation, Virtual Learning Communities (VLC) can improve 21st century teaching and learning by incorporating principles of globalization and localization. This research aimed to develop a model for knowledge management of local wisdom via the VLC for instructional management. The research procedure comprised three phases: In Phase 1, the sample consisted of 376 primary education teachers obtained by quota sampling. In Phase 2, the population comprised 12 experts. In Phase 3, the sample comprised 1) 100 primary education teachers; and 2) 200 Grade 5 students, obtained by multi-stage sampling. Research data were analyzed using the mean, standard deviation, and content analysis. Research results were as follows: 1) The overall state of using local wisdom was rated at the highest level, and the problem and need for using local wisdom at the high level 2) Regarding results of the model included three main elements: 1) the components of the model, which included names, community members, community activities, knowledge on local wisdom, supporting technology, factors of knowledge construction, and measurement and evaluation; and 2) the steps of the model, which included six steps, namely, preparation for creating of the VLC, creation of the community, knowledge creation and storage, creation of a prototype and certifying of local wisdom knowledge, implementing the prototype in school, and conclusion and evaluation of knowledge management results, 3) The topmost 21st century skills of the teacher are local connections skills, the students are collaboration skills, and the students had learning achievement significantly at the 0.05 level.**

***Index Terms*—Virtual learning community (VLC), knowledge management, local wisdom, instructional management**

I. Introduction

Article 7 of the National Education Act, B.E. 2542 (Second revision, B.E. 2545) stipulates that "in the learning process, (the state) must…promote the religion, arts and culture of the nation, sports, local wisdom, Thai wisdom…" and Article 24 stipulates that "in instructional management, (the school) must organize activities to enable the students to learn from real experiences and real practices in various aspects of local wisdom, which will enable the students to be good persons who can learn on their own from various learning resources so that they become persons with learning avidity who can manage their own learning all the time and from all places". Also, Item 6 (1) of the Regulation of the Ministry of Education on the Committee for Curriculum and Academic Affairs Administration of Basic Education School stipulates that "(the school) must determine the details of contents in the school-based curriculum and guidelines for determining the proportion of learning areas and student development activities in accordance with the Basic Education Curriculum, socio-economic condition, arts and culture, and local wisdom" [1].

The Basic Education Curriculum of Thailand stipulates that "to enable the students to have knowledge and understanding on the nature and technology created by human beings and to be able to apply the knowledge rationally, creatively, and ethically" [2]. In addition, an indicator in learner-centered learning management is that "the students have direct experience related to the nature and environment", and an indicator in the teacher's teaching is that "the teacher uses diversified learning resources and connects them with the experience and life" [3]. From the above-mentioned indicators, it can be seen that the instructional management applying Thai wisdom is consistent with the principles of education provision with based on the National Education Act, 1999 (Second Revision, 2002) and Thailand National Strategy 2018–2037 [4].

The utilization of local wisdom in instructional management at the basic education level, especially at the primary education level, is an excellent approach to inculcate in the students the value of loving one's locality, the learning of learning substances consistent with their dwelling community, and the inheritance of the existing body of knowledge in the locality. However, the existing instructions concerning local wisdom in most primary schools at present focus on instructional management in the classroom and the occasional field trips to acquire knowledge as determined by the teacher, without the application of computer network technology to enable the students to exchange and share their knowledge. Therefore, the existing instructions concerning local wisdom are not as practical as they should be.

The virtual learning community concept is an efficient approach for the promotion of learning exchanges on local wisdom because the virtual learning community is the community that occurs from the participation and exchange of learning among the community members in the matters that they are interested in and are the communication channel that the group members can access via their smartphones to be used for solving the communication problems of persons in remote areas, creating the sense of community, and supplementing more learning experiences.

Since March 2020, in response to the COVID-19 pandemic, most institutions shut down face-to-face community and shifted to the virtual learning community. It challenged the

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current education system across the world and has forced students and instructors across all levels of education to engage in the ubiquitous use of virtual learning community. Educational administrators predict that online and blended courses will continue to be offered much more than before [5].

Even though many academic units have experience with blended learning and online learning, many need help in traditional procedures and teaching pedagogy. To maintain continuity in teaching and learning, some academic institutions that were previously hesitant to change their traditional pedagogical approach had to shift completely to online teaching and learning [6]. Online education and distance learning have become one of the most important topics faced by scholars, practitioners, and policymakers [7]. The uncertainty of COVID-19's transmission and mutation could produce a lasting effect on education and permanently change how education is delivered [8].

The virtual learning community platform has been recognized and their number has increased rapidly, resulting in the access to knowledge information being accomplished rapidly both in the simultaneous type and non-simultaneous type. Virtual learning communities help organize the learning environment based on contact, communication, and learning together. Therefore, the implementation of the virtual learning community concept in the learning exchange on local wisdom is the approach that can enhance the learning exchange of primary education teachers in Thailand to enable them to utilize local wisdom in their instructional management more efficiently. Based on the above discussion, the researcher is interested in the development of a model for knowledge management of local wisdom via virtual learning community for instructional Management so that the implementation of local wisdom in the instruction of teachers is undertaken systematically, resulting in the efficiency of instructional management and the promotion of conservation of local wisdom of Thailand to be more prevalent and sustainable along with Thailand in the future.

Hence, the objective of the research is to develop a model for knowledge management of local wisdom via the virtual learning community for instructional management.

II. Conceptual Framework

The conceptual framework of the model for knowledge management of local wisdom via the virtual learning community for instructional management has been synthesized by several researchers. See Fig. 1.

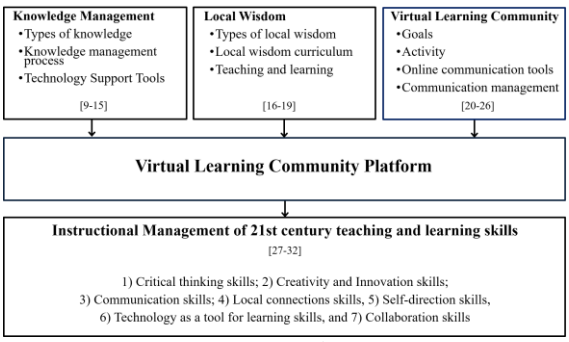

Fig. 1. Conceptual framework.

III. Literature Reviews

A. Knowledge Management

"Knowledge" is pointed to the social aspect of knowledge by reporting that knowledge is dynamic since it is created in social interactions among individuals and organizations. Generally, there are two forms of knowledge: tacit knowledge and explicit knowledge [9]. Tacit knowledge is hard to formalize and communicate where the explicit knowledge can be easily collected, organized, and transferred through digital means and can be found in documents, books, or online [10, 11]. Knowledge management captures, transfers, and reuses knowledge [12].

In the school context, the virtual environments and social media tools must allow knowledge to be created at the teaching department level to be transformed into a professional learning community (PLC) and finally into teachers' community knowledge. Even though these levels are independent, they constantly interact, leading to innovation. In the local wisdom topic, the key to creating classroom knowledge is to mobilize and convert tacit knowledge [13]. Efficient conversations provide greater creativity, stimulate sharing of tacit knowledge and the creation and justification of concepts, are essential to developing powerful prototypes, and lubricate the flow of knowledge sharing between groups of teachers in the local wisdom topics [14]. VLC vouch for its members promotes socialization between them, creates trust through mechanisms that guarantee the quality of information, offers solutions for the access, categorization, and sharing of knowledge, and provides an environment that facilitates the creation, searching, exchange, retention, evaluation, and reuse of knowledge. These environments introduce a new dimension to relations, allowing members to work as a team, collaborative learning, using active learning and authentic assessment in their classroom. Most VLC offer resources that facilitate and promote social interaction and local wisdom information sharing to teachers. Social media platforms used in VLC include: Facebook, Line, Email, Chats, Forums, Wikis, Video Conferencing, etc. In addition, VLC also offers users the option to upload data and media. All these processes generate different types of information that the community must manage. Local wisdom knowledge made available by VLC members, explicitly or implicitly (through various communication methods or by uploading documents), must be formalized, captured, and stored in information repositories. To organize and allow retrieval, knowledge management techniques may be used [15].

B. Local Wisdom

Local wisdom is seen as relevant to social studies because local wisdom is a cultural product that includes philosophy, values, norms, ethics, rituals, beliefs, habits, customs, and so on [16]. Knowledge of the local wisdom for educators is undoubtedly a prerequisite. The meaning of local wisdom in education is much less [17]. Local Values are beginning to fade and be abandoned, diminishing the student's understanding of the value of local cultural values. The context of local wisdom in primary school is divided into ten categories, which can be applied in primary school six

categories (Agriculture, Local folksong, Local folk tales, Local arts, Local language, and literature) [18].

The concept of local wisdom studies in school introduces the child to different ideas, beliefs, values, and cultures, even related to teaching students' values and attitudes. This indicates that local wisdom can be used as a source of material and values that serve as the basis for the direction of acting and behaviors linked to their daily lives [19]. In primary school, curriculum development integrates local wisdom into the school curriculum. In the learning process, situated learning, authentic assessment, and technology are tools to develop cognitive skills, psychomotor skills, and affective skills based on local situations.

C. Virtual Learning Community (VLC)

A virtual learning community is a group of people who share a common interest in a topic or area, a particular form of discourse about their phenomena, tools, and sensemaking approaches for building collaborative knowledge and valued activities, whether as a formal or informal activity [20, 21]. In the school context, a group of teachers may constitute a VLC. The VLC is a network of individual teachers who share a topic of teaching about which they communicate online. A learning process between teachers can occur by asking questions to other members and learning from the answers and shared personal experiences, representing a natural source of knowledge [22]. This knowledge is informal or structured, and its access and reusability by VLC members (Community leaders, Facilitators, recorders, Computer network personnel, and Master Teacher) [23, 24]. There are several characteristics of a VLC, the topic that creates and sustains interest, the community: That teachers join in developing further their interest, and the teaching practice: The application of the ideas or activities in their classroom or teaching. Members of VLC need technological support to facilitate their learning activities (e.g., during a group discussion process). One of the most critical challenges of such communities is to enhance knowledge exchange and sharing among the different members [25]. The VLC enhances a community of knowledge sharing, learning management processes, a sense of connection, practices, skills, and new conceptual techniques. It also develops teacher self-efficacy and improves learners' efficiency. Therefore, the community's success stems from the members' involvement in creating knowledge. and applying knowledge to be helpful in teaching [26].

D. Learning Management

Effective learning management is the whole effort in the cooperation process to optimally utilize all available resources to achieve the learning objectives that have been effectively set. Based on effective primary learning management in the 21st century can be summarized as follows: First, the 21st Century demands the role of teachers who are increasingly high and optimal to realize more effective learning. Second, effective learning management is all the teacher's efforts to optimize all available and available resources so that learning can run smoothly and achieve goals promptly, on target, and on time. Third, effective learning management is the key to success in reaching a bright future of national education, preparing the nation's generation with a high knowledge to be helpful for the nation, state, and religion. Fourth, effective learning management is one of the critical indicators for realizing International or National Education Standards, including content standards, processes, competencies of graduates, educators and education personnel, facilities, infrastructure, management, and educational assessment. Fifth, effective learning management in the 21st century cannot be simplified into strategies, methods, techniques, and learning models alone but rests on the level of identity and integrity of the teacher's personality in carrying out his duties and daily personal life. Sixth, effective learning management is oriented towards realizing learning competencies, which are the learning process that seeks students to have knowledge, skills, attitudes, insights, and applications by the learning objectives. Seventh, effective instructional management of 21st century teaching and learning skills can be realized by relying on seven strengths, namely: 1) Critical thinking skills, 2) Creativity and innovation skills, 3) Communication skills, 4) Local connections skills, 5) Self-direction skills, 6) Technology as a tool for learning skills, and 7) Collaboration skills [27–32].

IV. Research Methodology

The procedure of this research comprised four phases as follows:

A. Phase 1

The survey of the state, problems, and needs of learning management with the use of local wisdom via virtual learning community for instructional management by analyzing and synthesizing textbooks, the national education policy, local wisdom content, and primary school context. The survey was conducted on primary school teachers who teaching under the Office of the Basic Education Commission, Ministry of Education. A total of 376 teachers from eight provinces of Thailand were chosen for the survey using cluster random sampling. This phase includes the following three steps:

Step 1. Study the national education policy, the primary school context, and types of local wisdom to be used as the framework for creating the questionnaire.

Step 2. Develop the questionnaire as follows:

1) Study, analyze, and synthesize concepts, research, and the literature related to the state, problems, and needs of local wisdom, virtual learning community, and learning management of 21st century teaching and learning skills.
2) Design a draft version of the questionnaires. The questionnaire forms consist of 3 components of the state, problems, and needs of learning management with the use of local wisdom via virtual learning community for instructional management using a 5-point Likert scale. The questionnaire was submitted to three experts to verify its content validity, including complying with the research objective, the contents to be measured, and the correctness and clearness of language usage in each item. Two experts evaluated the quality of the questionnaire as being at an excellent level, while the third expert evaluated its quality as being at a good level. The index of item-objective congruence indices of the questionnaire

were between 0.60–1.00.

Step 3. Use the questionnaire. The researcher undertook the data collection in Phase 1 by distributing electronic questionnaires to teachers in primary schools. A total of 376 electronic questionnaires were returned a return rate of 94.71%. All returned questionnaires were completely filled (100%). Standard deviation (S.D.), average values, and content analysis will be used to analyze the results.

B. Phase 2

The development of a model for knowledge management of local wisdom via the virtual learning community for instructional management by analyzing and synthesizing textbooks, the national education act, articles describing research related to the knowledge management process, local wisdom contents, and instructional management of 21st century teaching and learning skills published in national and international journals. This includes the following four steps:

Step 1. Synthesize the results of the state, problems, and needs of learning management with the use of local wisdom via virtual learning community for instructional management from Phase 1, to be used as the framework for creating the draft version of the VLC platform.

Step 2. Synthesize the knowledge management process, the local wisdom contents, and the instructional management of 21st century teaching and learning skills. The instructional management of 21st century teaching and learning skills can be realized by relying on seven strengths, namely: 1) Critical thinking skills, 2) Creativity and innovation skills, 3) Communication skills, 4) Local connections skills, 5) Self-direction skills, 6) Technology as a tool for learning skills, and 7) Collaboration skills.

Step 3. Develop the VLC platform based on the knowledge management process to enhance instructional management of 21st century teaching and learning skills as follows:

1) Study, analyze, and synthesize concepts, research, and the literature related to steps, components, and details of the virtual learning community, the knowledge management process, and the instructional management of 21st century teaching and learning skills.
2) Design a draft version of the VLC platform by making use of the website, moodle platform, and social media brought together in four modules: Lobby space (VLC website), Learning space (Activity room), Communication space (Cafe room), Knowledge repository space (Showcase room), and Assessment space (Testing room). Each module has sub-functions.

Step 4. Use 12 experts to evaluate the appropriateness of the VLC platform. These experts are experts on educational technology and communications, local wisdom, and educational research and evaluation. They had the academic rank of instructor, assistant professor, or associate professor. All of them had been staff members in higher education institutions for at least five years. They had knowledge and understanding of educational technology and communications, instruction using local wisdom, and academic research and evaluation. A total number of nine experts participated in the focus group discussion, while the other three experts provided recommendations for model improvement via the document that the researcher sent to them in advance. Content analysis will be used to analyze the results.

C. Phase 3

The evaluate instructional management of 21st century teaching and learning skills via the VLC Platform which consists of the following four steps:

Step 1. Design the instructional management of 21st century teaching and learning skills evaluation forms. The evaluation forms consist of seven components of instructional management of 21st century teaching and learning skills using a 5-point Likert scale. The three experts evaluate the appropriateness of the evaluation form. All of the 3 experts evaluated the quality of the evaluation forms as being at an excellent level, with the IOC indices ranging from 0.66 – 1.00.

Step 2. Design the 20 lesson plans in the Additional Course on Local Wisdom in the Lower Central Region (Nakhon Pathom Province) of the Social Studies, Religion, and Culture Learning Area at the Grade 5 level, each of which takes two hours per week in one semester period (five months) on the topic of "Thawarawadi Civilization". The three experts evaluated the overall quality of lesson plans at a high level, with the aspect receiving the highest evaluation result being the feasibility of implementing the lesson plans.

Step 3. Design the 30-item learning achievement test. Its difficulty indices range from 0.36–0.78; its discriminating indices range from 0.22–0.78; and its reliability coefficients range from 0.80–0.84.

Step 4. Use the VLC platform integrated with knowledge management process. This is where the VLC platform is used by two groups, including 1) 100 primary school teachers from 20 schools in Suphan Buri and Nakhon Pathom provinces of Thailand who participated in activities based on the virtual learning community platform. A teacher from Tessaban 4 (Chaowana Preecha Uthit) School in Nakhon Pathom province was selected as the prototype teacher, and 2) 200 Grade 5 students in the Lower Central Region of Thailand, obtained by multi-stage sampling. They were randomly assigned into the experimental and control groups, each of which consisted of 100 students. The experiment was of the pretest–posttest control group design. Standard deviation (S.D.), average values, t-test, and content analysis will be used to analyze the results.

V. Results and Discussion

A. Results of the Survey of the State, Problems and Needs of Learning Management with the Use of Local Wisdom via Virtual Learning Community for Instructional Management

Results of the survey indicate that 1) the overall state of using local wisdom of the teachers was rated at the highest level (Mean = 4.62, S.D. = 0.61), with the teachers in The Learning Area of Social Studies, Religion, and Culture using local wisdom in their instruction more than teachers in other learning areas; and the local wisdom on philosophy, religion, and tradition was most often used in the instruction; 2) on the problems, the overall problem concerning at the high level (Mean = 4.44, S.D. = 0.83), with the item receiving the

highest rating mean being that on the problem of knowledge management culture; and 3) on the needs, it was found that the teachers had overall need for using local wisdom at the high level (Mean= 4.41, S.D.= 0.77), with the item receiving the highest rating mean being that on the need to know the roles of concerned persons in using local wisdom in instructional management.

B. Results of Development of the Model of Learning Management with the Use of Local Wisdom via Virtual Learning Community for Instructional Management

The developed model for knowledge management of local wisdom via the virtual learning community for instructional Management consists of two main elements as follows:

1) The components of the model

The components of the model are shown in Fig. 2.

Fig. 2. The components of the model.

Fig. 2 shows the components of virtual learning community for instructional management consists of six components as follows:

1) The community members which consist of (1) community leaders, (2) facilitators, (3) experts on local wisdom, (4) the recorders, (5) the computer network personnel, and (6) the members of the virtual learning community.
2) The community activities which consist of (1) the establishment of the virtual learning community, (2) the creation and search for knowledge, (3) the storage of knowledge, (4) the utilization of knowledge, and (5) the follow-up and evaluation.
3) The knowledge on local wisdom which consists of the data on important local knowledge in each province in the Lower Central Region, classified into five study fields: (1) agriculture, (2) local folksongs, (3) local folk tales, (4) local arts, and (5) local language and literature.
4) The supporting technology which consists of the following: (1) the website, (2) Moodle platform, and (3) the social media.
5) The factors of knowledge creation which consist of the following: (1) the motivation, (2) the ability, (3) the relationship of virtual learning community members, (4) the opportunity, and (5) the confidence.
6) The measurement and evaluation is the measurement and evaluation of the operation's success by the components and steps of the model for knowledge management of local wisdom via the virtual learning community for instructional management.

As shown in Fig. 2, regarding the components of the model for knowledge management of local wisdom via the virtual learning community for instructional management, which are found to be six components, i.e., community members, community activities, local wisdom knowledge, supporting technology, factors of knowledge construction, and measurement and evaluation; this is probably because the knowledge management of local wisdom via the virtual learning community in the Thai culture needs to have the insertion of local wisdom to be a component of knowledge management. In addition, this research focuses on learning management of local wisdom via the virtual learning community. Therefore, the component of supporting technology is an important factor in the use of computer technology to help in the learning management of local wisdom via the virtual learning community. This point is consistent in that the components of VLC must consist of behavioral change management, communications, procedure and tools, training and learning, evaluation, and praising and rewarding [33–36].

2) The steps of the knowledge management of local wisdom via the virtual learning community for instructional management

The steps of the model are shown in Fig. 3.

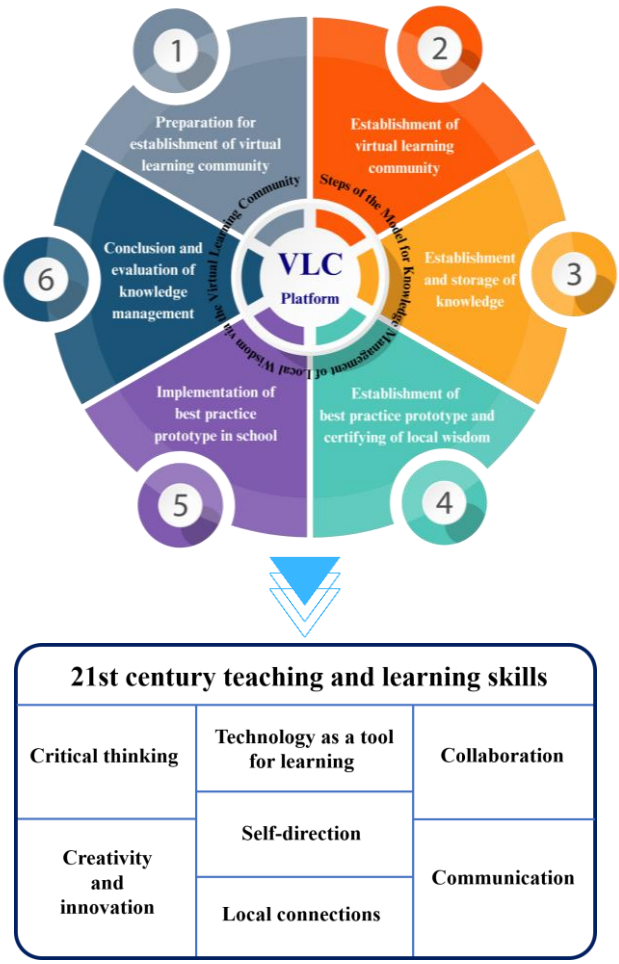

Fig. 3. The steps of the model.

TABLE I: RELATIONSHIP OF THE MODEL STEPS, PARTICIPANTS, AND OUTPUTS

The steps of the model	Participants	Output of VLC Platform
I. Preparation for the establishment of the virtual learning community *Related to:* - *Technology as a tool for learning skills* - *Collaboration skills* [28, 30]	- Administrator - IT wizard - Technician	- Prototype of Virtual learning community - username and password for VLC members
2. Establishment of the virtual learning community *Related to:* - *Communication skills* - *Technology as a tool for learning skills* - *Collaboration skills* [28–30]	- Administrator - IT wizard - Technician	Virtual learning community - Lobby space (VLC website) - Learning space (Activity room) - Communication space (Cafe room) - Knowledge repository space (Showcase room) - Assessment space (Testing room)
3. Establishment and storage of knowledge *Related to:* - *Critical thinking skills* - *Communication skills* - *Local connections skills* - *Self-direction skills* - *Technology as a tool for learning skills* - *Collaboration skills* [27–31]	-Chief knowledge officer - Facilitator - VLC member (Teachers, local wisdom members) - Meeting note taker	Knowledge of local wisdom: - Agriculture - Local folksongs - Local folk tales - Local arts - Local language and literature
4. Establishment of best practice prototype and certification of local wisdom *Related to:* - *Critical thinking skills* - *Communication skills* - *Local connections skills* - *Technology as a tool for learning skills* - *Collaboration skills* [27–30]	- Teachers - Local wisdom members	Knowledge of local wisdom: - Agriculture - Local folksongs - Local folk tales - Local arts - Local language and literature
5. Implementation of best practice prototype in school *Related to:* - *Critical thinking skills* - *Creativity and innovation skills* - *Communication skills* - *Local connections skills* - *Self-direction skills* - *Technology as a tool for learning skills* - *Collaboration skills* [27–32]	- Teachers - Students - Local wisdom members - Local members	- Lesson Plan - Blended learning
6. Conclusion and evaluation of knowledge management *Related to:* - *Critical thinking skills* - *Communication skills* - *Local connections skills* - *Technology as a tool for learning skills* - *Collaboration skills* [27–30]	-Chief knowledge officer - Facilitator - VLC Member (Teachers, local wisdom members) - Meeting note taker	Best practice of knowledge of local wisdom - Agriculture - Local folksongs - Local folk tales - Local arts - Local language and literature

As shown in Fig. 3 and Table I, the steps of the model for knowledge management of local wisdom via the virtual learning community for instructional management, which is found to be six steps, i.e. the preparation for the establishment of the VLC, the establishment of the VLC, the establishment and storage of knowledge, the establishment of best practice prototype and certifying of local wisdom, the implementation of best practice prototype in school, and the conclusion and evaluation of knowledge management; this is probably because the procedure of knowledge management needs to be clear and continuous to create the body of knowledge for the community members. The researcher obtained the steps of knowledge management of local wisdom from the synthesis of documents and previous research findings resulting in the obtained steps being clear. Also, the obtained steps were submitted to the experts for brainstorming discussion and then certification. The final result is that these steps of knowledge management of local wisdom, as presented in this research, are clear, complete, and consistent with the steps advocated by the Thailand Productivity Institute.

C. Results of the Evaluation of Instructional Management of 21st Century Teaching and Learning Skills Using a Virtual Learning Community Platform

1) Evaluation of instructional management of 21st century Teaching skills based on the teachers' perception

TABLE II: EVALUATION OF INSTRUCTIONAL MANAGEMENT OF 21ST CENTURY TEACHING SKILLS BASED ON THE TEACHERS' PERCEPTION

21st century teaching skills	*Mean*	Description
Local connections skills	3.93	1–3 times per week
Technology as a tool for learning skills	3.88	1–3 times per week
Creativity and innovation skills	3.83	1–3 times per week
Communication skills	3.81	1–3 times per week
Collaboration skills	3.72	1–3 times per week
Critical thinking skills	3.44	1–3 times per month
Self-direction skills	3.40	1–3 times per month

As shown in Table II, presents the seven 21st century teaching skills based on the teachers' perceptions. It clearly shows the skills followed which they practice 1–3 times per week; local connections skills (Mean = 3.93) is a very evident skill. Next in line is technology as a tool for learning skills (Mean = 3.88), creativity and innovation skills (Mean = 3.83), communication skills (Mean = 3.81), collaboration skills (Mean = 3.72), Other skills followed which they practice 1–3 times a month; critical thinking skills (Mean = 3.44), and

self-direction skills (Mean= 3.40).

From the results presented in Table II, local connections which they practice 1–3 times a week is rated highest by the teachers. Local connections refer to students being able to apply what they have learned to local wisdom contexts (agriculture, folksongs, folk tales, arts, and language and literature). It is very clear how the teachers transfer learning to the future teachers of Thailand by applying the localization and contextualization thrusts of the enhanced Basic Education Curriculum which direct all schools and learning programs to relate curriculum content and competencies to the social and educational context of communities being served [37]. Next is the use of technology as a tool for learning being practiced 1–3 times per week. It refers to students being able to manage their learning and produce products using appropriate information and communication technologies. Effective use of technology in virtual classroom environments and its successful integration increases the productivity of instructional processes. Constant and good-quality support supposed to be provided for teachers is quite important for technology use in virtual classroom environments [38]. Third in rank is creativity and innovation skills that is being practiced 1–3 times per week which refers to students being able to generate and refine solutions to complex problems or tasks based on synthesis, analysis, and then presenting what they have learned in new ways. This is the same idea of Outcome Based Education (OBE) in which outcomes are derived from careful analysis of what students must be able to do to succeed in the future. Next in rank which are being practiced 1–3 times per week are communications skills; collaboration skills; and critical thinking skills; self-direction skills which are being practiced for 1–3 times per month.

2) Evaluation of instructional management of 21st century learning skills based on the student's perception

TABLE III: EVALUATION OF INSTRUCTIONAL MANAGEMENT OF 21ST CENTURY LEARNING SKILLS BASED ON THE STUDENTS' PERCEPTION

21st century learning skills	*Mean*	Description
Collaboration skills	3.91	1–3 times per week
Technology as a tool for learning skills	3.87	1–3 times per week
Local connections skills	3.83	1–3 times per week
Self-direction skills	3.74	1–3 times per week
Creativity and innovation skills	3.44	1–3 times per month
Critical thinking skills	3.44	1–3 times per month
Communication skills	3.37	1–3 times per month

As shown in Table III, presents the seven 21st century learning skills based on the student's perception. It clearly shows the skills followed which they practice 1–3 times per week; collaboration skills (Mean = 3.91) is a very evident skill. Next in line is technology as a tool for learning skills (Mean = 3.87), local connections skills (Mean = 3.83), and self-direction skills (Mean = 3.74) Other skills followed which they practice 1–3 times a month; creativity and innovation skills (Mean = 3.44), critical thinking skills (Mean = 3.44), and communication skills (Mean = 3.37).

From the results presented in Table IV, presents the eight 21st century learning skills based on the student's perception. It clearly shows collaboration skills is a very evident skill for the students as they practice it 1–3 times per week. Collaborative learning is highly contextual. It depends on the person and his/her preference, on the topics, the purpose or goal being worked towards, and the cycles of the collaborative learning process. A student's personality is one of the factors that makes collaborative learning a success. Next is the use of technology as a tool for learning. These are the students of 'Z Generation' defined as the generation of technologically advanced students. Next in line is local connection which they have learned to local wisdom issues. It is very clear how the students transfer knowledge to their real life. Next is self-direction skills which they also practice 1-3 times per week. This has proven that students in this generation, though disturbed by social media, still know that they need to actively participate in classes, network with other students, talk to their teachers, have good time management, set personal goals, and actually go to class in order to succeed [39]. Other skills followed which they practice 1–3 times per month; creativity and innovation skills; critical thinking skills; and communication skills.

3) Comparison of learning achievement scores of the experimental and control group students

TABLE IV: COMPARISON OF LEARNING ACHIEVEMENT SCORES OF THE EXPERIMENTAL AND CONTROL GROUP STUDENTS

Groups	n	*Mean*	*S.D.*	t	Sig.
Control Group (Traditional instruction)	100	13.40	1.537	7.498	0.000*
Experimental Group (Local wisdom usage instruction)	100	15.27	1.964		

*$p < 0.05$

From Table IV, it can be seen that the students in the experimental group who learned based on the lesson plan via the VLC Platform have a learning achievement mean score significantly higher than that of the students in the control group who learned under the traditional instructional management at the 0.05 level of statistical significance.

Based on the results of using the model for knowledge management of local wisdom via the virtual learning community for instructional Management, which is found that the students learning under lesson plan via the VLC Platform has learning achievement significantly higher than that of the students learning under traditional instructional management at the 0.05 level of statistical significance; the point of discussion is that it is probably because the model for knowledge management of local wisdom via the virtual learning community has the steps that are not too difficult, focuses on allowing the students to participate in knowledge management [40–42]. Therefore, the students pay good attention to learning and participating in learning activities resulting in their learning achievement being significantly higher than that of the students who learned under traditional instruction. This research finding is in agreement with the research that the use of learning management that promotes local wisdom results in the learners' learning achievement being significantly increased [43].

VI. CONCLUSION

This research is the development of a model for knowledge management of local wisdom via the virtual learning

community. Therefore, there should be research studies on the models for knowledge management of local wisdom via social media with the emphasis on integration of the groups of persons involving with the management of education and local wisdom of the community, such as Thai indigenous medical practitioners, government officials, higher education instructors, local wisdom learned men, farmers, and entrepreneurs to participate in the research in order to obtain guidelines for knowledge management of local wisdom that integrates knowledge from various occupations, and to know about guidelines for creation of the networks for knowledge management of local wisdom of the community.

Using an infinity of tools and the web's ease of communication, the VLC platform gain space and is today an important domain of research and application, allowing the development of more complete and useful environments for the management of knowledge, i.e., the sharing of their best practices by the community members.

For an effective knowledge transfer between community members, it is necessary a high level of confidence between the members and a strong cooperation and collaboration culture. This confidence is developed through work practices that promote and allow members to work together on projects and problems. With this, the members tend to cooperate and collaborate within the community implementing effective management of the knowledge that circulates through the VLC.

VLC platform needs technology and social media tools that facilitate communication between members. These tools provide effective 21st century teaching and learning skills. Most environments that support VLC offer support for the implementation of best practice prototype in school, as well as repository technology for managing local wisdom documents. However, these environments only facilitate but do not enhance 21st century teaching and learning skills. In this case, the environment will no longer be only support tools, but it is the responsibility of VLC members.

Conflict of Interest

The author declares no conflict of interest.

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