The Development of an e-Service Learning Model for Promoting a Digital Active Learning Community of Mainstreaming Students in Higher Education

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Article info

Abstract

This research was a development and innovative study. The objectives were 1) to develop a model of e-Service learning for promoting a digital active learning community of mainstreaming students in higher education, 2) to study the effectiveness of the e-Service learning model for promoting a digital active learning community of mainstreaming students in higher education, and 3) to study the digital active learning community of mainstreaming students. The samples used in the research were as follows: 1) Three people consisted of experts for in-depth interviews, 2) 400 students participated to study the conditions of the mainstreaming approach and to promote the digital active learning community, 3) seven people consisted of experts for the focus group, 4) 62 students participated to study the digital active learning community of mainstreaming students, and 5) five experts certified the model. The research instruments were as follows: 1) In-depth interview for the e-Service learning model for promoting the digital active learning community of mainstreaming students in higher education, 2) a questionnaire to study the conditions of mainstreaming for promoting the digital active learning community, 3) an evaluation form for the model of the e-Service learning for promoting a digital active learning community of mainstreaming students in higher education was used to develop the model through a focus group, 4) the questionnaire on students' digital active learning community practices of mainstreaming students, and 5) an assessment form certifying the model. The statistics used in the research were percentage, mean, and standard deviation. The research results were as follows:

1. The e-Service learning model for promoting the digital active learning community of mainstreaming students in higher education consisted of 1) the components of the e-Service learning model: 1.1) preparation, 1.2) electronic social service collaboration network, 1.3) digital technology, 1.4) digital product for academic services to society, 1.5) learning outcomes, and 1.6) assessment of the learning management. 2) The steps of e-Service learning of the mainstreaming stage were 2.1) team building, 2.2) community selection, 2.3) project organisation,

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2.4) project implementation, 2.5) knowledge dissemination, and 2.6) summary and reflection of the knowledge. Furthermore, the qualified experts certified that the developed model was appropriate at the highest level.

2. The implementation of the project consisted of 11 service recipients. The digital products were logos of 11 community merchants who applied for services to promote their online products. The mainstreaming students developed the necessary skills in using the programme. This incentivised the learners to be aware of contributing to the local community and creating pride and confidence in themselves.

3. For the digital active learning community of mainstreaming students in higher education, the overview of being a proactive digital learning community of students participating in practice was at a practical level every time. When considering each of the six aspects, it was found that the practice was at a practical level every time. These aspects are sorted in descending order as follows: Teamwork, knowledge reflection, learning exchange and communication, knowledge pursuit, knowledge transfer and linkage, while knowledge dissemination had a normal level.

Introduction

Advances in digital technology have been used in teaching and learning to solve the problem of accessing learning content. Furthermore, digital technology has facilitated the implementation of online learning activities, such as online lesson websites, smart classrooms, digital classrooms, digital teaching and learning management, etc. Today's learners are known as digital natives born amid digital technology in this digital era. They can adapt quickly and use various technologies to facilitate their daily life, including studying (Diaz & Saldana, 2020). Although there are many questions of how students of today's generation are using digital technology appropriately, the duty of those involved is to develop learners in the digital era to be aware of their roles and social responsibilities. Moreover, what challenges do teachers face in managing learning for learners in the digital age (Said et al., 2014)? The teacher must provide a learning space and an environment for learning from practice, prepare new learning resources using digital technology to exchange learning, implement activities to develop learners according to the learning objectives, and have communication channels (Punie & Ala-Mutka, 2008). Additionally, to increase the role of learners from using technology to become a participant and creative creator, socially responsible citizenship skills would need to be developed through online courses in social service or e-Service learning (Said et al., 2014). Coupled with the spread of the Coronavirus disease 2019 (COVID-19), it was necessary to organise learning activities together with social services to maintain the value of teaching and community service. Consequently, this situation was an opportunity to begin a valuable e-Service learning experience during the COVID-19 pandemic. The e-services were developed due to the offerings being provided without the necessary of human contact. However, social service evaluations have yet to be widespread, and there are no known studies in various societies. There are also several methodological limitations of existing studies in this field (Dapena et al., 2022; Shek et al., 2022).

Quality higher education is a tool that helps people with disabilities have better lives and sustainable development. Despite the higher education policy and the structure of support services for disabled learners in each country's higher education system, it was found that they were at a point of conflict regarding their rights. As such, kindness and social models of disability would support the access to learning resources and various services to facilitate people with disabilities. During the COVID-19 pandemic, many of the measures affected all students. Regardless, schools, educators, and families had to deal with the realities of transitioning to distance learning platforms. In addition, there is limited research on educating students with disabilities and special behavioural needs using technology individually. Additionally, Kim and Fienup (2022) stated that during the COVID-19 outbreak, there were alarming reports that students missed special online educational activities due to the inability to access resources, and various activities were organised to increase the participation and interaction between students. The results showed that the effective integration of a variety of activities had the

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effect of effectively increasing participation in online learning. Therefore, it would be necessary to establish best practices for distance learning with this population and prepare learners for integration into an ever-changing society. Knowledge and academic skills quickly become obsolete, and soft skills are the new alphabet of the twenty-first century. Service learning is another teaching approach that positively affect the development of soft skills (Culcasi et al., 2022).

Social service learning, or a traditional non-profit social service, is an instructional arrangement that physically bring learners to the community to work in collaboration. This could be conducted by applying knowledge from classroom management to be valuable and meaningful social services in the community. In addition, teamwork skills are promoted along with intellectual skills and social responsibility. As such, this is characterised by digital active learning with social services (Said et al., 2014; Strait & Sauer, 2004; Waldner et al., 2012). e-Service learning is teaching and learning management in which learners participate in digital community-based learning. It is a form of learning whereby both learners and the community work together through a virtual environment. This continually expands the scope of the service and extend the service area by acting as a guideline for students to drive the area, culture, society, and economy. Moreover, this type of learning activity promotes social activities, morality, and student leadership (Guthrie & McCracken, 2010a; 2010b). In other words, learners' participation in creating work would implement academic services to various agencies, society, and/or communities with digital technology. Furthermore, it promotes active learning, which leads to the exchange of best practices, build an active learning community of learners through digital technology (Rutgers University, 2019a), and receive academic services for people in the organisation, society, and/or community to learn together. As a consequence, creative exchanges of learning experiences allows for communicated understanding between different learners. Educational institutions, agencies, and/ or communities also receive academic services (Wells, 2017). Hence, creating integration of teaching and learning to enhance learning skills in the twenty-first century, where society and the community would benefit through project implementation that promotes the role of the learners' participation through academic services, as well as improve the quality of life in the community and society. As a result, the community and

society become stronger and promote integrated academic services with concrete teaching and learning in electronic formats. Therefore, the learning activities are an educational approach that focus on the outcomes that learners would have practiced for teachers, general students, and students with special needs. In addition, the community and society could learn creatively by expanding digital learning spaces to develop learners to enhance a digital active learning community. The remainder of this paper is organised as follows: The objectives of this research, the literature review and conception framework, methodology, results, discussion, and finally presenting the conclusion and recommendations.

In addition, this research is beneficial to the academic world. All stakeholders, including teachers, are offered guidelines for instructional effectiveness for students with differences. Librarians could deliver information and media appropriate to the learners' individual needs. This provides assistance for students with special needs, and a community of people who could support learning and create experiences for students and benefit from the academic services. Educational institutions that facilitate digital technology would need to manage the infrastructure through an online learning space that provides equal access to technology for all. Therefore, everyone in every aspect can have a role in making education and society move forward together. This would further result in raising the quality of learning and life equally and fairly for all.

Objectives

1) To develop a model of e-Service learning for promoting a digital active learning community of mainstreaming students in higher education.

2) To study the effectiveness of the e-Service learning model for promoting a digital active learning community of mainstreaming students in higher education.

3) To study the digital active learning community of mainstreaming students.

Literature Review and Conceptual Framework

1. e-Service Learning

e-Service learning means an instructional combination of teaching, learning, and academic services, both online and on-site. This is conducted by combining, as appropriate, both learning management and social services online with electronic tools and online

learning management in classrooms and academic service areas to promote the creation of a digital active learning community of learners through teamwork, exchange of knowledge and communication, knowledge transfer and linkage, knowledge dissemination, and knowledge reflection. Awareness of social responsibility and ethics from using digital technology for social services are initiated (Said et al., 2014; Strait & Sauer, 2004). There are four forms of learning management through e-Service learning (Waldner et al., 2010):

1.1 Organise online teaching and learning to provide knowledge and understanding of the content. Then, deliver the academic services to community agencies that want to receive the services in that area.

1.2 Organise instruction approaches in the classroom to provide knowledge and understanding of the community agencies' content and academic services online.

1.3 Provide all teaching and academic services online that are called "Extreme".

1.4 Combine pedagogy and academic services, both online and on-site, to be blended as appropriate in the classrooms and academic service areas.

However, there are challenges in organizing online courses and services. Online academic services could be conducted even if students were in a laboratory or library by using service tools, such as the Internet, avatar technology, smartphones, instant messages (IM), Facebook, blogs, artificial intelligence (AI), and chatbots (Doyle, 1987). Nevertheless, questions arise such as, Do teachers need to consider which tool to use to affect the learners positively? Which technology could cause a minor negative effect on learners? Would there be a positive impact on the use of technology in providing an environment for online learning and academic services (Guthrie & McCracken, 2010a; 2010b)

The critical elements of e-Service learning are technology and communication, including teaching design, creating a reflective learning community by considering the method that cost less, and ease to manage, as to allow learners to express their true learning nature as a true learning centre. Consequently, the learners, teachers, and communities could use digital learning spaces creatively (Dowing, 2012; Malvey et al., 2006; Waldner et al., 2012).

2. Digital Learning and Active Learning Community

Digital learning is defined as learning management for learners supported by technology in both virtual and blended environments. This covers the daily lifestyles and understanding of the supportive nature of the learner, which comes from a variety of media that promotes individual and group learning simultaneously with the exchange of knowledge that occurs in social networks (Na-Songkhla, 2018). Additionally, digital learning is effective from an instructional approach by providing academic services to society or the community. Teachers need to provide a place related to daily life, and a community way of life that affect students' collaboration and learning leading to the interaction between the learners and the relationship between the community and the educational institution in another way (Copeland, 2015). Hence, instructors are responsible for facilitating the provision of various facilities in order to make the activities of the digital learning community thrive. One option involves an academic service that serves both society and the community. This commitment becomes evident in learners' daily lives as they utilize their knowledge and skills to integrate and foster the creation of a digital active learning community. Employing digital technology, the academic service contributes to society and the community, thereby establishing a dynamic digital learning environment.

3. Digital Active Learning Community

A digital active learning community refers to the grouping of learners to create an active learning community by using digital technology to drive the learning community to work as a team in the quest for knowledge using digital technology. Learners engage in activities in terms of the exchange of knowledge and communication, knowledge transfer and linkage, knowledge dissemination, and reflection of knowledge from electronic social and academic services. In building a successful digital active learning community, students need to be planners, seek information sources of interest, select and manage the information resources, and integrate information from various learning sources. Then, the learners discuss, exchange, and learn together to lead to the creation of quality work. Finally, the value is assessed, and feedback from the learning and findings from such processes could make advances in digital technology because there are issues that are challenging to achieve in a classroom. Therefore, a digital environment is created to enhance the learning efficiency and value by exploring creative knowledge work and presenting conclusions with digital technology (Ally, 2008; Cooper & Scriven, 2017; International Federation of Library

Associations & Institutions, 2015).

4. Mainstreaming Approach

Education management at all levels facilitates learning for learners with more special needs, as the National Scheme of Education B.E. 2560-2579 (2017-2036) of Thailand emphasises equal, quality, and happy education. Learners must have the skills necessary to survive in the twenty-first century, including the skills to participate in the digital age according to the 20-Year Digital Economy and Society Development Plan B.E. 2560-2579 (2017-2036), for creating an inclusive education and inclusive society with digital technology (Office of the Education Council, 2017). The mainstreaming approach accepts a national education plan where students with special needs attend side-by-side with others. This results in learners of various characteristics learning to accept each other. Moreover, learners come to understand the similarities and differences in living together, where ordinary learners accept their peers' disabilities as part of their life's acceptance of disability incompetence. Therefore, it would be necessary to develop learning and improve all learners' quality of life.

The mainstreaming approach is educational management for students with special needs to attend at least one regular class and receive additional educational services on a regular full-time basis. The learners receive educational services like everyone else; learners who participate in this class would have fewer disabilities, readiness for learning, and emotional and social maturity commensurate with their age. Studying in this system would not mean that special services would be reduced only by changing how they are managed and delivered. Teaching and learning management styles suitable for joint learning are considered in the learning method for all learners to work together, accept, and help each other. Learning management can be achieved successful through a research-based and creative learning method through the implementation of co-creation projects between students with special needs and general students. In addition, educational institutions would need to prepare facilities for students with special needs to study together, such as digital technology, a Disability Support Service (DSS), facilities in the form of a universal design or the state of friendly useability, etc. to unlock access to knowledge based on the learning needs of students with special needs (He et al., 2022; Netwong, 2019).

The conceptual research framework consists of e-Service learning, digital learning, active learning, and mainstreaming approach's effectiveness to the digital active learning community of mainstreaming students (Figure 1).
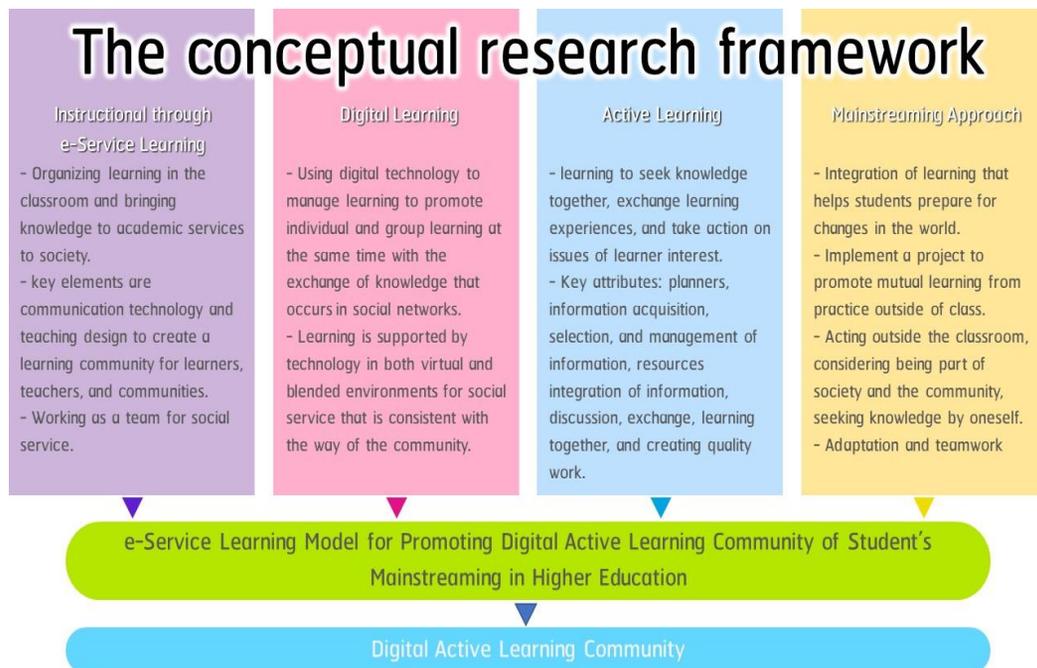

Figure 1. Research framework.

The elements of instruction through e-Service learning consist of organising learning in the classroom and bringing knowledge to academic services to society. The essential critical components are communication technology and teaching design to create a learning community for learners, teachers, and communities - team building for social service work.

In addition, digital learning drives e-Service learning by using digital technology to manage learning to promote individual and group learning simultaneously by exchanging knowledge in social networks. Learning is supported by technology in virtual and blended environments for social service that is consistent with the way of the community.

Active learning comprises learning to seek knowledge together, exchanging learning experiences, and taking action on issues of the learners' interest. Key attributes include planners, information acquisition, selection and management of information resources, integration of information, discussion, exchange, learning together, and creating quality work.

Mainstreaming approaches involves the integration of learning that would help students prepare for changes in the world, implementing a project to promote mutual understanding from practice outside of the class and adaptation, teamwork for acting outside the classroom, considering being part of society and the community, and seeking knowledge by oneself.

In summary, the development of this model included the concept of e-Service learning to organise learning together with social services by using digital learning that relied on digital technology for learning and teamwork during the COVID-19 pandemic. Active learning allowed the students to seek information sources by organising joint knowledge with general learners and learners with special needs. This research of e-Service learning was conducted with 100% online teaching during the COVID-19 outbreak. Then, the students provided social services in the community area. This encouraged the students to practice both online and visit the area's services in the community. Additionally, teachers offered a virtual and blended learning environment by using various media to facilitate individual and group learning, while communicating and exchanging knowledge to create an active learning community.

Variables

Independent variable: The model of e-Service learning consisted of promoting a digital active learning community of mainstreaming students in higher education. The model of this research was divided into two parts: Components of the e-Service learning model and the steps of e-Service learning of the mainstreaming students.

Dependent variable: This comprised the digital active learning community of mainstreaming students and the model's suitability. The characteristics of the digital active learning community included 1) teamwork, 2) knowledge pursuit, 3) knowledge exchange and communication, 4) knowledge transfer and linkage, 5) knowledge dissemination, and 6) knowledge reflection. The model's suitability could become an instructional guideline for special education students. The personnel in educational institutions and communities, including those involved, would have a role in making education and society move forward together.

Research Methodology

Before conducting the research, the research team requested a certificate of ethics of humans-Documentary Proof of Exemption Ethical Review Subcommittee for Human Research COA. NO: SDU-RDI 2020-009, Protocol No: 004/2020. This research was a development and innovative study; the research method was divided into three phases: 1) to develop a model, 2) to study the effectiveness of the model, and 3) to study the digital active learning community. The presentation was divided into five topics: 1) Population and Sample, 2) Scope of the Research, 3) Research Instruments, 4) Data Collection, and 5) Data Analysis.

1. Population and Sample

1.1 Population

The population was composed of the following groups:

1) Experts for in-depth interviews.

2) Mainstreaming students consisting of general students and students with special needs that studied together at the higher education level.

3) Experts for the focus group.

4) Mainstreaming students to study the effectiveness of the e-Service learning model.

5) Experts to certify the e-Service learning model.

1.2 The sample group

The sample group consisted of 1) three experts for an in-depth interview, who were educational technology specialists and special education specialists.

2) Four hundred students studying in higher education to study the condition of learning management to promote digital learning for mainstreaming. 3) Seven experts for a focus group, who were educational technology, information science, information technology, and special education specialists. 4) Sixty-two mainstreaming students at Suan Dusit University, Bangkok, Thailand to study the effectiveness of the e-Service learning model, and 5) five qualified experts to certify the model.

2. Scope of the Research
    2.1 Scope of the study area
        The scope of the study area was universities that offered a mainstreaming approach in higher education. At least one university in each region was selected to represent the respective region, consisting of the Central Region, the North, Northeast, and the South, to study the guidelines for developing the e-Service learning model to promote the digital active learning communities of the mainstreaming students in higher education. A specific target group of universities consisting of Kasetsart University, Chiang Mai Rajabhat University, Sakon Nakhon Rajabhat University, and Songkhla Rajabhat University was selected with the most significant number of special needs students in each region (Office of Student Promotion and Development, 2018). A sample of 100 students from each university, a total of 400 students, studied the learning management conditions to promote digital learning for mainstreaming students to be a guideline for developing the model of e-Service learning.

    2.2 The subjects
        The subjects taught with a mainstreaming approach at Suan Dusit University were the subject of information technology for home economics careers that studied the effectiveness of using the e-Service learning model to promote a digital active learning community.

3. Research Instruments
        For collecting the data, the following research instruments were utilised:

    3.1 An in-depth interview form for e-Social learning that promoted a digital active learning community for mainstreaming students in higher education. The tool for interviewing experts about organising learning through e-Services learning to promote an active digital learning community for mainstreaming students contained seven topic questions as follows: Methods for teaching electronic social services, the teaching model that promotes an active digital learning community of mainstreaming students, learning styles that affect academic achievement and being a digital active learning

community, appropriateness of the conceptual framework model, and feasibility and caution in organising teaching and learning to serve as guidelines for further model development.

    3.2 The questionnaire on the learning management conditions that promoted digital active learning for mainstream students explored the learning conditions for promoting digital active learning for mainstreaming students of the universities in each region. The characteristics of the device consisted of four parts as follows: Part 1: Basic information from the respondents, a total of five items. Part 2: Learning conditions to promote digital active learning for mainstreaming, which was divided into six areas: learning formats, online learning channels, format of learning media used in class, learning activity format, digital learning support, and acceptance of the use of digital technology for all learners in a fair and equal manner, a total of 26 items. Part 3: The need to promote digital active learning for mainstreaming, which was divided into three areas: Infrastructure supporting digital learning and teaching activities, a total of 15 items. Finally, Part 4: Factors, problems, and obstacles that affect digital active learning for mainstreaming, which was divided into two areas: The effect of digital active learning for mainstreaming students, and problems and obstacles that affect digital active learning literacy for mainstreaming students, a total of 12 items.

    3.3 An evaluation form for the model of the e-Service learning for promoting a digital active learning community of mainstreaming students in higher education was used to develop the model through a focus group.

    3.4 Social networking applications, such as Microsoft Teams, Line, and YouTube as e-Service learning tools with digital technology. These tools were used for the e-Service learning activity to study the effectiveness of the e-Service learning model for promoting a digital active learning community of mainstreaming students.

    3.5 The questionnaire on students' digital active learning community practices of mainstreaming students was utilised to study the digital active learning community of mainstreaming students. The questionnaire consisted of six parts as follows: Teamwork, Knowledge Pursuit, Knowledge Exchange and Communication, Knowledge Transfer and Linkage, Knowledge Dissemination, and Knowledge Reflection, a total of 35 items.

3.6 An assessment form certifying the model. This tool was for experts to certify the effectiveness of the model.

The in-depth interview form, questionnaire, and active digital learning community assessment form for mainstreaming students were verified for their effectiveness by five experts. The experts checked the validity for accuracy according to the content validity and appropriateness of the language. This was done by using a questionnaire on the learning management conditions that promoted digital active learning for mainstream students and a questionnaire on students' digital active learning community practices of mainstreaming students that assessed the consistency of the questions with the research objectives or index of item objective congruence (IOC). The average IOC value for each item was equal to 0.80-1.00. The research team improved the language used to clarify the definitions of terms used in the questionnaire. For improving the questionnaire, details were added, and then the questionnaires on the practice of digital active learning community of mainstreaming students were piloted with groups that were not the target group but had similar characteristics as follows: Library and Information Science students, Faculty of Humanities and Social Sciences and Home Economics Programme, School of Culinary Arts, Suan Dusit University with 50 students studying together with general students and special needs students to find the reliability of the questionnaire. Cronbach's alpha coefficient was obtained as 0.943.

4. Data Collection

4.1 An in-depth interview form for e-Social learning that promoted a digital active learning community for mainstreaming students in higher education was used for interviewing three experts for in-depth interviews. Data from the interviews guided the development of the model, and a questionnaire was also used to survey the learning management to promote digital active learning for mainstreaming students.

4.2 A questionnaire on the learning management conditions that promoted digital active learning for mainstream students was used. Data from 400 students' surveys guided the development of the model and focus group.

4.3 An evaluation form for the model of the e-Service learning for promoting a digital active learning community of mainstreaming students in higher education to the focus group was used. Data from seven experts through the focus group proved the model, and

the data wereused to study the effectiveness of the e-Service learning model and to study the digital active learning community of mainstreaming students.

4.4 The steps of the e-Services learning to promote the digital active learning community of mainstreaming students were as follows:

1) Students participate in group projects of five-seven people with one-two students with special needs per group to carry out activities by using knowledge in the subjects they had studied to serve society or the community by using digital technology. The project involved a problem that arose in the community, so digital technology could be used to help solve the problem.

2) Once a community is selected for academic services, the students complete a problem-solving project by analysing the problem and the concept of solving problems by searching for knowledge. The teachers act as advisors and facilitators in solving the problems.

3) Create electronic social service projects for agencies or communities to participate or the owner of the problem participates in collaborating to solve the problem. The principles of design thinking and teamwork are implemented, which allows the students to find the needs of the service recipients. Students consult, exchange, and discuss to find ways to create work that would meet the community needs. Design work using Microsoft PowerPoint and other programmes with expertise, inquire about the satisfaction of the service recipients, and then present the project through the exchange of knowledge.

4) Carry out electronic social service projects. Students are involved with the exchange of knowledge, communication, and transfer of knowledge, and connecting knowledge. This reflects the teachers' determination and students' adaptability in working together during the COVID-19 outbreak.

5) When the project is completed, students present the results of the project. Knowledge is disseminated through video clips and infographics.

6) Summarize the learning results and reflect on the knowledge. Exchange knowledge together by implementing electronic social service projects.

4.5 Use the questionnaire on students' digital active learning community practices of mainstreaming students to collect data from 62 students, who consisted of 48 general students, six deaf students, seven autistic students, and one student with down syndrome to analyse

the digital active learning community of mainstreaming students.

4.6 Use the assessment form to have the model certified by five experts with the data for analysis to be appropriate with the model.

5. Data Analysis

5.1 The quantitative analysis of the data obtained from the study of the learning management conditions that promoted digital learning for mainstreaming students in higher education was conducted by analyzing the mean and standard deviation. The practice questionnaire was a digital active learning community. There were five scoring criteria levels: Practice every time, practice regularly, practice sometimes, practice infrequently, and never practice.

5.2 Qualitative data analysis: Content analysis was used based on the information obtained from the interviews. The data from the experts' interviews were categorised, interpreted, and summarised to result in the development of the model and for the development of a questionnaire on the learning conditions for promoting digital active learning for mainstreaming students. The data from the interviews with mainstreaming students were used to support the learning management outcomes and the development of digital active learning communities.

5.3 The quantitative analysis of the data obtained from the study of the mainstreaming students to promote a digital active learning community was conducted by analysing the mean and standard deviation that gave a performance score of 1-10 points. The interpretation criteria were divided into five levels of practice as follows:

Practice every time with a mean score range of 8.30-10.00.

Practice regularly with a mean score range of 6.50-8.29.

Practice sometimes with a mean score range of 4.70-6.49.

Practicing infrequently with a mean score range of 2.90-4.69.

Never practice with a mean score range of 1.00-2.89

5.4 The appropriateness of the model was analysed with the mean and standard deviation. There were five criteria levels: The highest, high, moderate, low, and the lowest.

Results

This research was a development and innovative study. The objectives were 1) to develop a model of e-Service learning for promoting a digital active learning community of mainstreaming students in higher education, 2) to study the effectiveness of the e-Service learning model for promoting a digital active learning community of mainstreaming students in higher education, and 3) to study the digital active learning community of mainstreaming students. The results are presented according to the respective objective as follows:

1. The results of developing an e-Service learning model for promoting a digital active learning community of mainstreaming students in higher education were as follows:

The results of interviews with experts to develop the model found that teaching by e-Service learning of mainstreaming students, all learners must be prepared, create common points of collaboration under the influx of complex information, and use appropriate digital technology during COVID-19. Composition and arrangement steps of instructional to promote the digital active learning community of mainstreaming students. Group processes should be emphasized, and digital technology should be used according to the needs of the learners in carrying out the activities. It is possible to develop such a model. The learner must have sufficient knowledge to provide academic services to the community. The learner must have skills in digital technology and learners' attitudes in accepting each other's differences.

Results of the study on the mainstreaming conditions in higher education found that online learning uses PowerPoint as the main medium. There was e-Learning for the course using Google Classroom. The sample group has needs regarding internet infrastructure and various information systems that provide services in the university to facilitate ($\overline{x} = 3.75$; SD = 0.93). As for supporting digital learning, it was found that digital technology needs to support joint activities between learners to benefit all learners ($\overline{x} = 3.75$; SD = 0.85). Factors affecting learning to promote digital active learning for mainstreaming were teachers who must appropriately prepare the content and information ($\overline{x} = 3.37$; SD = 1.18).

The interviews and surveys of the mainstreaming conditions in higher education have been analyzed and synthesized to create a draft model. It consists of elements

of the e-Service learning format and e-Service learning steps to promote the digital active learning community of mainstreaming students for the focus group critique; the focus group results, and essential components of the model were as follows. 1) Preparing for readiness in various aspects, such as preparing relevant people, activity plans, operational processes, digital technology, and evaluation. 2) Network for social services such as educational institutions, personnel in the organization, community, or agency receiving services. 3) Appropriate technology during COVID-19 to facilitate all learners, focusing on using social media. There was a website or e-Learning for the course. 4) Digital products created from social services such as infographics, clips, and e-Book. 5) The learning outcome was the digital active learning community, and 6) Evaluation: Groups must be organized to work as a team for the learning management process. Select communities for academic service. Carry out projects according to community needs. When implementing a social service project, digital products from social services must be included. To spread knowledge through clips and infographics. Finally, learning results are summarized, and knowledge is reflected.

Finally, the e-Service learning model for promoting a digital active learning community of mainstreaming students in higher education consisted of the following:

1) The components of the e-Service learning model were 1) preparation, 2) electronic social service collaboration network, 3) digital technology for e-Service learning, 4) digital product for academic services to society, 5) learner's learning outcomes, and 6) the assessment of learning.

2) The processes of learning by e-Service learning were 1) team building, 2) community selection, 3) project organisation, 4) project implementation, 5) knowledge dissemination, and 6) summary and reflection of the knowledge.

The model required qualified experts to certify that the developed model was appropriate at the highest level ($\bar{x}$ = 4.56; SD = 0.50). The suitability of the model elements was at the highest level ($\bar{x}$ = 4.51; SD = 0.50), and the steps of e-Service learning of the mainstreaming stage were at the highest level ($\bar{x}$ = 4.77; SD = 0.43).

The e-Service learning model for promoting a digital active learning community of mainstreaming students in higher education is shown in Figure 2.
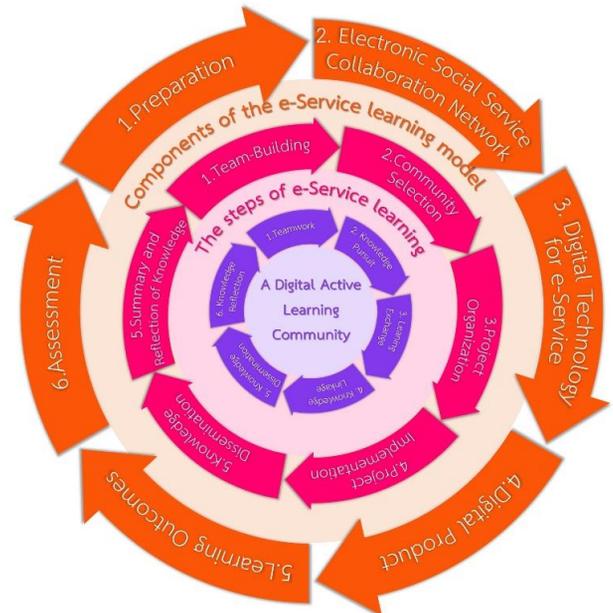

Figure 2. The e-Service learning model for promoting a digital active learning community of mainstreaming students.

Figure 2 presents the components and process of learning by e-Service learning to create the effectiveness of a digital active learning community consisting of teamwork, knowledge pursuit, knowledge exchange and communication, knowledge transfer and linkage, knowledge dissemination, and knowledge reflection.

The nature of the model was a combination of learning management and collaborative academic services, both online and on-site. This was consistent with the concept of Guthrie and McCracken (2010a; 2010b), which cautioned against setting up an online environment with the least negative effect on the learners. They also emphasised technology to promote the stakeholders' participation in learning management and extended the academic service time outside the classroom. Therefore, it could be said that such a model was implemented according to the concept of classroom learning management and then presented the knowledge of the academic services to society. This could be done online by using digital technology to promote awareness of social responsibility among the learners' exchanges of experiences and in-depth ideas for mainstream students. The critical elements of this e-Service learning were technology and communication, and teaching design to create a reflective learning community by considering a method that would cost less and easy to manage. This

allows the learners to showcase their nature as a true learning centre, as well as educators, and communities alike could creatively use the digital learning spaces (Dowing, 2012; Waldner et al., 2010).

2. The effectiveness of learning by e-Service through promoting digital active learning communities

The effectiveness of learning by e-Service to promote digital active learning communities of mainstreaming students in higher education from implementing the project consisted of 11 service recipients. The digital products were logos of 11 community vendors who applied for services to promote their online shop. The digital products are shown in Figure 3.

(10) Mit Kaset Ltd., Nakhon Phanom Province, and (11) Fresh produce shop.

The students who studied with e-Service learning developed skills using the programme. The presence of e-Service learning was an incentive for the learners to be aware of contributing to the local community and creating pride and confidence in themselves.

The instruction of e-Service learning to promote the digital active learning community of mainstreaming students in higher education was educational management so to provide academic services that would be beneficial to the development of the community, society, and the country. According to

Figure 3. The digital products from e-Service learning.

From Figure 3 the digital products were logos in communities' shops for promoting goods online that consisted of: (1) "Ang Pao" shop, (2) "Khrua Sanuk Saen" restaurant, (3) "Duangjai Fried Chicken" restaurant, 4) "Je Tuk Chicken Rice" restaurant, (5) Grandma's Crepe Shop, (6) "Cute Bears" shop, (7) "S & Family" shop, (8) "Goal Kick" shop, (9) "Ratchadamri Herbs" shop,

the Higher Education Act B.E. 2562 (2019) of Thailand, higher education institutions would need to develop knowledge to be up to date, arrange research creativity, and conduct innovation development. In the academic services, one should be a role model for society, create learners' quality, achieve academic or professional excellence, foster morality, ethics, and responsibility to

oneself, the family, community, culture, and the country. Hence, higher education institutions need to encourage learners to participate in social activities to foster public consciousness. The instruction would bring the knowledge and experience to be used for the benefit of the general public. The activity model combines teaching, learning, and academic services, both online and on-site. The integration of instruction needs to be appropriate, both online and offline, in the classroom and academic service areas (Waldner et al., 2010). The new learning management concept promotes the citizens' skills for participating in social responsibility. This could be developed with an online system (Said et al., 2014), thus allowing the learners to participate in online communi- ty-based academic services. As such, this is a virtual collaborative learning arrangement between an educational institution and a community that would jointly receive academic services or work (Strait & Sauer, 2004). In addition, the results of such learning management needs to reflect the thinking after teaching the thought process to review the implementation of the project in the whole system. This would be conducted before, during, and after the project was finished. The purpose is to create an understanding of themself and the events that use this knowledge and experience to help students in life in the future.

   3. Digital Active Learning Community
   The overview of being a digital active learning community of mainstreaming students participating in the practice was shown to be almost every time ($\bar{x} = 8.43$; SD = 1.73).

   Being a digital active learning community among students who studied together comprised six aspects: 1) teamwork, 2) knowledge pursuit, 3) knowledge exchange and communication, 4) knowledge transfer and linkage, 5) knowledge dissemination, and 6) knowledge reflection. The results of the data analysis are shown in Table 1.

Table 1. Digital active learning community

Item	$\bar{X}$	SD	Practice Level
1. Teamwork	8.74	1.51	Every Time
2. Knowledge Pursuit	8.45	1.54	Every Time
3. Knowledge Exchange and Communication	8.53	1.52	Every Time
4. Knowledge Transfer and Linkage	8.42	1.73	Every Time
5. Knowledge Dissemination	7.81	2.19	Regularly
6. Knowledge Reflection	8.60	1.64	Every Time
Overview	**8.43**	**1.73**	**Every Time**

A digital active learning community is a concept to create a community of learners who use digital technology as a driver to develop learners in an online team. This is a way to promote student learning by working as a team. This include the knowledge inquiry by using digital technology to carry out activities together in terms of exchanging knowledge, communication, knowledge transfer, knowledge linkage, knowledge dissemination, and knowledge reflection (Ally, 2008; Cooper & Scriven, 2017; International Federation of Library Associations & Institutions, 2015). One option is academic services by using digital technology for a project-based online service to society and/or the community. Academic services would be related to the people's way of life in the community and locality, which are seen in the learners' daily life. However, expanding the service area and having no time limit for providing academic services to the community and society affected the learners to have digital active learning characteristics. Overall, the digital active learning community of students participating in the practice was almost at the level of every time. When considering all six aspects, it was found that the course was at the practical level every time. They could be sorted in descending order as follows: teamwork ($\bar{x} = 8.74$; SD = 1.51), knowledge reflection ($\bar{x} = 8.60$; SD = 1.64), knowledge exchange and communication ($\bar{x} = 8.53$; SD = 1.92), knowledge pursuing ($\bar{x} = 8.45$; SD = 1.54), knowledge transfer and linkage ($\bar{x} = 8.42$; SD = 1.73), while knowledge dissemination was at a regular practice level ($\bar{x} = 7.81$; SD = 2.19). This feature was consistent with the Cambridge Assessment International Education concept (Cambridge Assessment International Education, 2019) that active learning was conceptually based on the self-knowledge theory. As a result, the learners would understand the content by self-learning and be able to apply contextual knowledge in problem-solving. This drives understanding and meaningful learning for learners according to the Rutgers University (2019) concept that outlined the effectiveness of digital active learning. The collaborative nature of the digital active learning community requires the provision of technology to manage knowledge. This encourages learning exchange, communication, and collaboration online among the members, as well as support collaborative discussion and reflection to promote digital active learning. Consequently, the use of digital technology expands the exchange of the learning experiences. This could be done to achieve the highest

learning outcomes for learners in higher education institutions. Assessments should also be conducted in a meaningful and realistic learning environment, such as service learning. However, for courses involving students from different faculties and disciplines, the learners would need technology as a medium for better collaboration in the pedagogy.

From the interviews, students expressed interesting opinions, such as "Got more knowledge; you can also use your knowledge to help the community and society and can also be used as an additional career from studying.", "Electronic social service activities have both advantages and disadvantages, but this kind of activity is more convenient and easy to understand.", "It is a very good activity that benefits others and makes it possible to truly help society.", "Activities can help the community more or less; it is good to strengthen or help people in the community.", "It is a good thing to use with students to learn and be able to actually use what they have learned; it can be used to further your career.", "Electronic social services to the community will help the community have knowledge, ability to access media that make the community prosper and get the most benefit.", "It made us know how to design logos to help in various areas with the store, thus making it possible to put the knowledge to good use.", "It's a good activity that allows students to practice using electronic forms

and also to practice creativity and working together in groups.", "Makes it possible to practice working with the community in a new way and is easily accessible to most people.", "Generates knowledge, understanding, and acknowledgement of new things about electronics for people in the community and helps find ways to disseminate various information in the community more quickly.", "Social service activities teach us about creating unique work in the form of logos and participating in working with others; there is direct communication from the business operator.", and "It is a good teaching and learning activity that allows learning together between teachers, students, and product brand owners amidst the COVID-19 situation. We must live in the new normal even though we cannot experience it all but learning must continue throughout everyone's life." Therefore, it could be said that the qualitative data were consistent with the results of the quantitative analysis that students had a 100% positive attitude towards online learning by using the knowledge gained from studying to support it and create experiences with the community.

Upon completion of the research, the results were the e-Service learning model for promoting the digital active learning community of mainstreaming students in higher education, the implementation of the project, and the results of the development of the digital
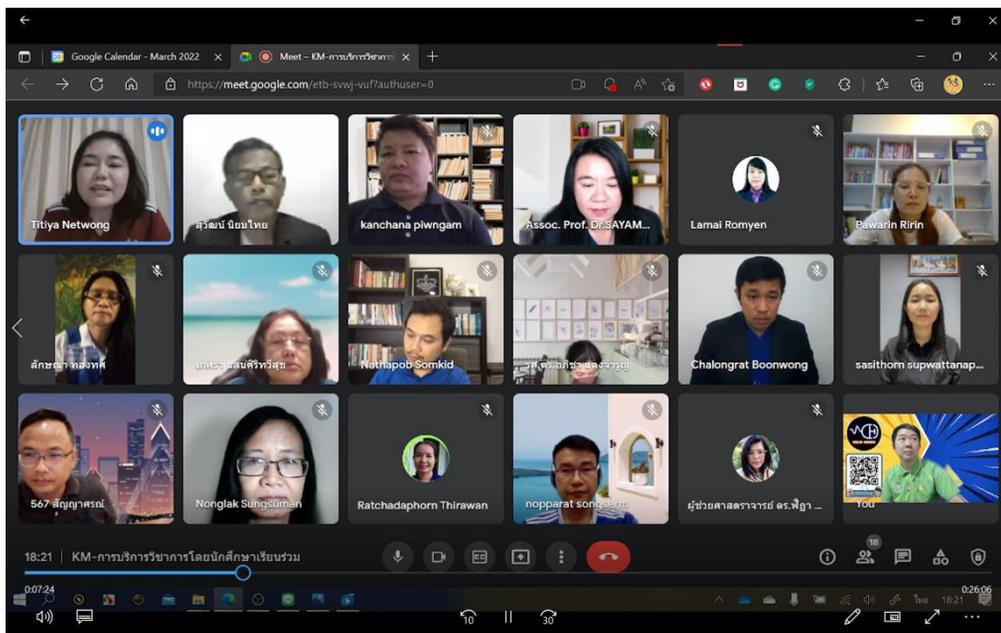

Figure 4. Knowledge management (KM) for good practices

active learning community of mainstreaming students. The research results have been expanded to disseminate knowledge to other educational institutions and related organizations. This was an essential activity in expanding knowledge. It was about applying research results to wider use by knowledge management (KM) activities. According to the recommendations of experts to expand the active effects.

Knowledge Management (KM) for Good Practices

The research team carried out knowledge management (KM) for good practices from the results of the electronic academic service project to society, the community, and agency. Online discussions with educational institutions and entrepreneurs from 14 institutions were organised with a total of 20 people participating in the discussion (Figure 4).

For the knowledge management of e-Service learning to promote a digital active learning community of mainstreaming students, it was found that online classroom activities served as a starting point for educating the students to bring knowledge from the classroom to the academic services to the community. Therefore, the preparation of various aspects are an extension of the activities in the online class to raise the level. Because of the COVID-19 situation, 100% online learning had to be arranged for the learners. This form of learning was a long-distance learning model that solved the problem of teaching during the global COVID-19 pandemic (Okaz, 2015; Singh, 2021). As a result, various activities were necessary to prepare e-Service learning for mainstreaming students consisting of instructors, helpers, sign language interpreters, notetakers, stakeholders, students with special needs, and fellow students to be ready for the skills of using digital technology and having the electronic tools necessary to study online. The facility's convenience of e-Service learning, including digital product development and digital delivery addition, needed to be considered appropriate for the learning context. The suitability of the learners with differences also needed to be tailored to individual learners according to their individual needs (Netwong, 2021).

Knowledge management to proactively expand the results in the preparation, support, and best practices for e-Service learning for mainstreaming students is presented in Figures 5-7.
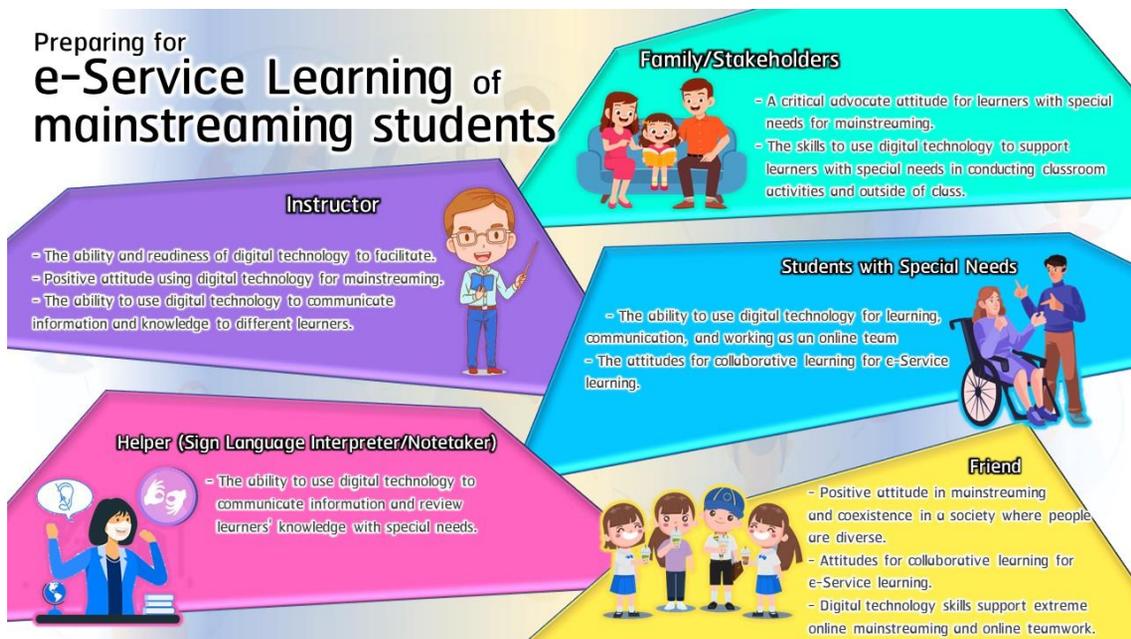

Figure 5. Preparing for e-Service learning of mainstreaming students.

Figure 6. Facility supports of e-Service learning

As shown in Figure 5, preparing for the e-Service learning of mainstreaming students consisted of the instructor, family or stakeholders, students with special needs, helper (sign language interpreter or notetaker), friends, and learning media. The instructors had to be competent in using technology, equipped with technology to facilitate e-Service learning, and have a positive attitude towards using digital technology for mainstreaming students. Families or stakeholders should have a positive attitude towards special needs learners. They need the skills to use digital technology to support the learners with special needs in conducting both online classroom activities and outside of class. Students with special needs could use digital technology for learning, communication, working in an online team, and have a shared learning attitude towards electronic social services. Helpers, such as sign language interpreters or notetakers, could use digital technology to communicate the information, review learners with special needs about the content, and use digital technology for e-Service learning. Friends or general learners need to have a positive attitude in mainstreaming, coexistence in a diverse society, and digital skills to encourage 100% mainstreaming for online teamwork. Finally, the learning media includes multimedia clips, knowledge review infographics, digital classrooms, digital social service

technologies, digital presentation technologies, and digital resources to facilitate the e-Service learning of mainstreaming students.

As shown in Figure 6, the facilities supporting e-Service learning would promote a digital active learning community for mainstreaming students consisting of digital technology, digital products, e-Service learning recipients, and electronic social service activities. In building digital active learning to expand the learning resources and online engagement, the rules of digital coexistence or netiquettes (Berry, 2019; Jamiai, 2019) need to be established, where the use of respect for others need to be applied from the first moment of the interaction of the participants. This relies on the commitment of the teachers and students to make the most of these assistive technological tools for effective interaction and immersion.

As shown in Figure 7, the best practice of e-Service learning for online mainstreaming to promote a digital active learning community consist of online classroom activities, integrated academic service activities, online assessment, and digital technology. Online classroom activities are essential in the issue of being a source of support for learners to acquire knowledge for e-Service learning. Integrated academic service activities includes demand surveys, online
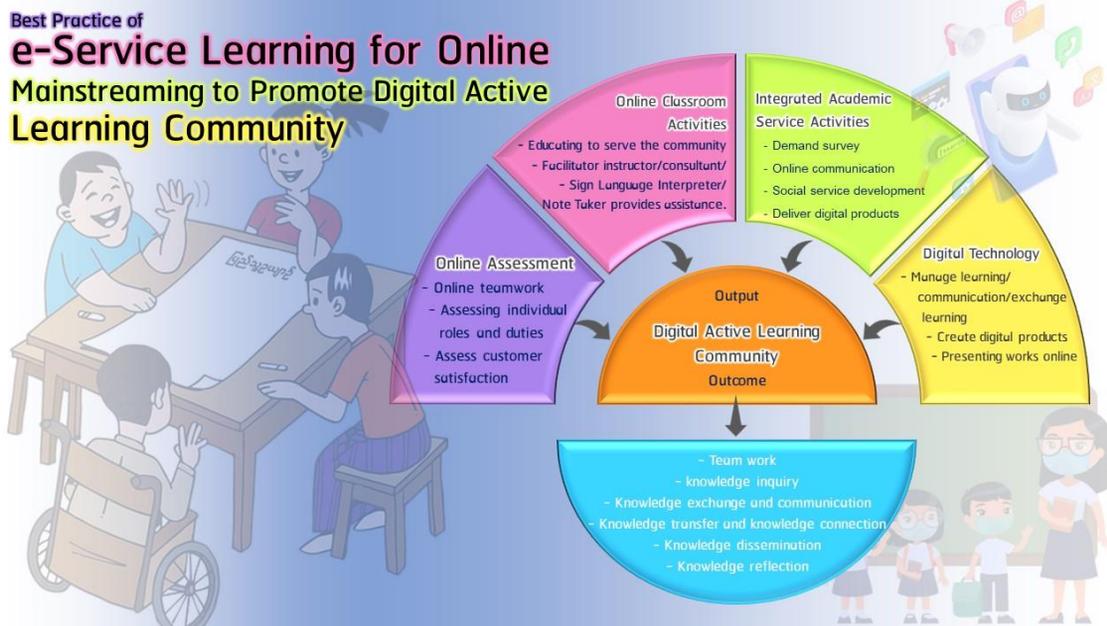
Figure 7. Best practices of e-Service learning for online mainstreaming

communication, social service development, and digital product delivery. Online assessment would result from the online collaboration of the individual roles and duties of the learners and assess the satisfaction of the service recipients from the e-Service learning of the mainstreaming activities.

Discussion

1. The E-Service learning model for promoting the digital active learning community of students mainstreaming in higher education consisted of 1) the components of the e-Service learning model: 1.1) preparation, 1.2) electronic social service collaboration network, 1.3) digital technology, 1.4) digital product for academic services to society, 1.5) learning outcomes, and 1.6) assessment of learning management. 2) The steps of e-Service learning of the mainstreaming stage were 2.1) team building, 2.2) community selection, 2.3) project organisation, 2.4) project implementation, 2.5) knowledge dissemination, and 2.6) summary and reflection of knowledge, and qualified experts certified that the developed model was appropriate at the highest level. The nature of the format was a combination of instructional and academic services both online and in the field. This was in line with the concepts of Guthrie and McCracken (2010); the activities were carefully arranged for the online environment to minimise any adverse effects on the learners. Emphasis was made on the technology to promote the stakeholders' participation in learning management and extending academic service hours outside the classroom. Therefore, this model was based on organising learning in the classroom and then using the knowledge to provide educational services to society. This was done online using appropriate digital technology to promote students' awareness of social responsibility. There was also an exchange of in-depth experiences with the students. Essential elements of this learning management included technology, communication, and teaching design to create a reflective learning community. Considering the method that cost less, it was easy to manage to provide opportunities for learners to express their true learning nature and become a true learning centre. Moreover, the learners, teachers, and communities could use the digital learning space creatively (Dowing, 2012; Waldner et al., 2012). Therefore, this format was not only for the teachers and students, but also for the agency and/or community assessing the competence and service satisfaction using different resources for virtual collaboration. Thus, it was necessary to organise learning activities and social services during the COVID-19 pandemic to maintain the value of teaching and community service. Additionally, this situation was an opportunity to begin a valuable e-Service learning experience during the COVID-19

outbreak (Dapena et al., 2022; Shek et al., 2022).

2. E-Service learning for promoting a digital active learning community of mainstreaming students in higher education was a concept of electronic social service learning to promote digital active learning. It was considered an educational arrangement to provide academic services to benefit the development of communities, society, and the country. Consistent with the Higher Education Act B.E. 2562 (2019), as stated in Sections 12 and 13, higher education institutions must develop and modernise knowledge, provide research, creation, and innovation development, including academic services, and should be a model for society. In addition, Sections 31 and 32: Education must develop the quality of students. Thus, the aim is for students to have academic or professional excellence, as well as foster people with morality, ethics, and responsibility towards themselves, their families, communities, society, and the country. Therefore, higher education institutions need to encourage students to participate in various activities with society to foster public consciousness in applying knowledge and experience to benefit the public. The implementation of the project consisted of 11 service recipients. Digital products were logos of 11 community merchants who applied for services to promote their online products. Mainstreaming students developed skills by using the programme. As such, this incentivised learners to be aware of contributing to the local community and creating pride and confidence in the students. Consistent with the research results, the social service project could develop information technology skills and volunteerism for students, including academic services to society to promote local wisdom (Netwong, 2014; Pijitkamnerd et al., 2020) through the social service project that had been carried out for the community; namely, the Bang Phli Ancient Market Community, Ban Khrua Nuea Community, Ban Sala Din Community, and Wat Thewarat Kunchon Community. The electronic social services focused on preserving community wisdom and promoting community tourism. The format of these activities was a combination of teaching and learning services, both online and in the actual field blended as appropriate, as well as both online and offline in the classroom and in areas that could receive academic services (Waldner et al., 2010). This was aligned with the new learning concept that promoted civic skills for participation in social responsibility, which were developed with an online system (Said et al., 2014) to allow students to participate in community-based academic services online. This was a virtual collaborative learning arrangement between the educational institutions and agencies and/or communities that received academic services or co-created work together (Strait & Sauer, 2004). In addition, the results of such learning management could be reflected after teaching, which was a process of thinking and considering the implementation of the entire project system before, during, and after the project was finished. The aim was to understand oneself and the events that occurred. This knowledge and understanding that arose could be used to benefit future lives (Asvapoositkul, 2019). According to Culcasi et al. (2022), their study's findings provided insights into the benefits of e-Service learning as a suitable strategy for students' personal skills development in leadership and self-evaluation. Their results also showed how e-Service learning could help raise students' awareness of the soft skills they need for their future professional careers.

3. For the digital active learning community of mainstreaming students in higher education, the overview of being a proactive digital learning community of students participating in practice was at a practical level every time. When considering each of the six aspects, it was found that the practice was at the practical level every time. They were sorted in descending order as follows: Teamwork, knowledge reflection, learning exchange and communication, knowledge pursuit, knowledge transfer and linkage, while knowledge dissemination was at a regular normal level. Therefore, the learners could create a deep digital active learning community, which was the idea of creating a community of learners that could use digital technology as a driver for developing student learning teamwork. Furthermore, this acted as a guideline to promote learning for students through teamwork, including the search for knowledge by relying on digital technology to carry out activities together in terms of exchanging knowledge, communication, and transferring knowledge, knowledge connection, dissemination of knowledge, and reflection of knowledge (Ally, 2008; Cooper & Scriven, 2017; International Federation of Library Associations & Institutions, 2015). One option was academic services by serving society and community by using the project as a base to provide academic service to society or community online or the use of digital technology that was related to the way of life of the people in the local community that could be seen in the daily lives of the students. In expanding the service areas, whereas no

time limit for providing academic services to the community and society, which affected the students' digital active learning community characteristics. It was found that the digital active learning community of the students participating in the study was at the practical level every time. As for disseminating knowledge, practices were at the regular practice level. This feature was consistent with the Cambridge Assessment International Education (2019) concept, which stated that active learning was based on the theory of self-knowledge creation. As a result, students understood the content by learning on their own. Consequently, they could apply the knowledge according to the context to solve problems. This drove learning with understanding and meaning for the students. Moreover, this aligned with Rutgers University's (2019) concept of the effectiveness of active digital learning. The collaborative nature of the digital active learning community made it necessary to provide technology to organise learning, exchanging of knowledge, communication, and collaboration among the members. Online collaborative discussion and reflection were also encouraged to promote active learning. As such, the use of digital technology expanded the space for exchanging the learning experiences. In addition, the learning outcomes for the students were those that the learners determined by themselves. This was done to achieve the highest learning outcomes for the students in the curriculum of higher education institutions. Moreover, assessments should be conducted in a meaningful and authentic learning environment, such as service learning. However, for courses involving students from different faculties and across disciplines, learners would need technology as a medium for better cooperation in the teaching and learning process (Marcus et al., 2018).

Conclusion and Recommendations

For the best practices from knowledge management for e-Services learning, it was found that there was 100% online learning and innovation development. This was achieved by working as an online team creating a new form of knowledge that arose, including mainstreaming with different learners and working for the establishment. Therefore, this was new knowledge in a work-based format. Hence, the results of the learners could be applied in real-life workplaces.

The e-Service learning model to promote the digital active learning community of mainstreaming students in higher education had an essential component

in the preparation, especially for the people. Therefore, in applying the model, it is necessary to prepare teachers and learners to create a positive attitude through mainstreaming approaches and technology to communicate with learners with special needs. This would prepare helpers to understand the nature of electronic social service activities. Moreover, the stakeholders would have the skills to use digital technology productively and creatively, which would let all learners learn the actual practice from the activities together. The use of digital technology to implement the e-Service learning management model needs to be undertaken in the context of students with special needs and general students for communication and collaboration, reflection of the data collection, and delivery of the academic services according to the needs of the service recipients.

According to the research, students with special needs in the mainstreaming approach consisted of students with hearing impairment, autism, and down syndrome. Therefore, future studies would need to add more diverse learners and have the technology to support a wider variety of special needs.

1. Recommendations for Implication

1) The learning management model by electronic social services to promote an active digital learning community of mainstreaming students at the higher education level has an essential element in preparation, especially regarding the people. Therefore, implementing the model requires the preparation of teachers and learners to build a positive attitude towards learning together and using technology to communicate with the learners with special needs. This also prepares the helpers to understand the nature of electronic social service activities. Stakeholders need the skills to use digital technology for their benefit and creativity. As such, all students learn the actual practice from participating in activities together.

2) The use of digital technology to implement the e-learning model by social services must be carried out within the context of the needs of students with special needs. In addition, general students would participate to communicate and collaborate. Reflection of the data collection and the delivery of the academic services to the service recipients are conducted according to the service recipients' needs.

2. Recommendations for Future Research

1) The research on students with special needs in inclusive learning consisted of learners with hearing

impairments, autism, and down syndrome. Therefore, future studies should add more diverse learners, as well as have the technology to support a wider variety of special needs.

2) The research should analyse the learners' participation in online environments that should be designed for all people (Universal Design), be user-friendly for everyone (Friendly Design), and be adapted to the learner. This would be 100% different from personalised learning.

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