Studying the Appropriate Digital Learning Context for Thai undergraduate Students

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Sawit Chimruang*

Abstract

This article demonstrates the context of digital learning management that influences learning and promotes computational thinking skills. The study consisted of Thai undergraduate students studying in the Faculty of Management Science, majoring in Management Information Systems, and the Faculty of Education, majoring in Teacher Professional Practice. Data were collected from 2 5 students to explore the learner context. This study examined learner opinions using a 5 -point Likert-type scale questionnaire developed by experts and used as a research tool. After pilot testing and conducting surveys to elicit respondents' views, the study found that in terms of digital learning, students used YouTube, Facebook, Instagram, Twitter, and email In terms of knowledge creation, students preferred to share learning content via Microsoft Teams with their peers. They included learning processes, teaching methods, teaching media, and assessments, applied modern content knowledge to daily life, learned content via Microsoft Teams, and created knowledge through content on their own, which would help them learn and perform better.

Keywords : Digital Media/ Knowledge Creation/ Knowledge Exchange

* Lecturer Dr., Faculty of Science and Technology, Suan Dusit University, Thailand
Corresponding Author E-mail Address: sawit_chi@dusit.ac.th

Introduction

Thai education has developed teaching and learning models based on the National Education Plan 2017-2036. Reforming education for Thai children to enter the 4.0 era is a drive towards becoming a "stable, prosperous, and sustainable" country. This initiative promotes learners' Internet skills, the utilization of digital systems, and knowledge (Chularut, 2018: 2363-2380). These skills are crucial to promoting the quality of life for all and the country's economic growth. Currently, digital technology plays a significant role in all sectors of life, including people's lives, livelihoods, operations, and learning. This has led to the necessity for digital technology use, which has become a highly sought-after issue. Digital technology capabilities are crucial for creating social innovations, helping communities, agencies, and organizations improve their quality of life and adapt to technological advancements. Digital technology capabilities are skills related to engaging with digital technology and its versatility, enabling innovation and organizational development. These skills can drive sustainable social change in all dimensions amidst a changing environment (Ministry of Education, 2024). This article aims to study the context for organizing digital learning appropriately for primary school children to promote computational thinking skills. The content is divided into 5 parts: 1) Study of the context of digital learning management, 2) Conceptual framework for designing digital learning, 3) Design and develop digital skills, knowledge, and abilities, 4) Assessment of the quality of digital learning, 5) Characteristics of those involved in designing and developing digital learning.

Humans can connect, get to know each other, and communicate freely through digital media. This is achieved through websites that connect individuals to individuals and groups. These digital media platforms provide a platform for people to connect (Kongkuan, 2020). Various tools are provided to facilitate media creation and content creation based on user interests, as well as linking digital media services commonly used in everyday life, such as email and web forums. A digital society and culture perspective prioritize learners and teachers, who can interact through tools and resources available within a given context, such as managing the digital environment.

Furthermore, digital media plays a crucial role in learning to enhance teaching and learning processes, particularly among university students. It has been confirmed that digital media is essential to facilitate learners' access to diverse, up-to-date, and reliable learning resources, as well as the needs of students (Digital Media and Learning Technology) (Kongkuan, 2020). Digital media is a practical tool for developing close relationships through social media use, reminding individuals of the need to connect through algorithms. In this

context, individuals who share ideas and thoughts develop common interests through social media (Pinkanon, 2021).

In the study of the context of digital media use that promotes knowledge creation, the study of interactive digital learning methods with the help of computers was conducted. Computer-Supported Collaborative Learning (CSCL) is an internet-based learning, sharing, and creating knowledge between participants using digital media to communicate or exchange resources. The main purpose of the CSCL environment is to support the exchange in the knowledge creation process that learners are aware of in developing the qualifications of a knowledge society (Papert, 1999). Therefore, it is an important variable to consider when researching social media used for human interaction. Internet and digital media use are important variables for learning, the relationship with contact with digital media, especially with friends, and the important role in learning of today's teenagers (Mustapha and Odediran, 2019: 1281-1298). In addition, students' digital learning involves the use of appropriate technology, and the connection between people, other people, and the location of media access. The researcher selected learning tools such as diverse learning, electronic multimedia works, new media, the use of appropriate technology, and contextual studies (Vygotsky, 1978).

Knowledge promotion builds on Piaget's work to emphasize the learning process's focus on self-construction. Knowledge promotion involves "building knowledge structures" or learning by doing. Thus, self-constructive learning differs from teaching in terms of the nature of knowledge and how individuals know it (Papert and Harel, 1991: 36, 1–11). Constructionism involves four stages: 1. Inquiry, 2. Experimentation, 3. Learning by doing, and 4. Doing by learn (Papert, 1999). The cognitive process abilities that include analyzing, evaluating, and constructing knowledge are very important for students. The cognitive and knowledge processes identified by (Anderson and Krathwohl, 2001)

It is crucial to study the learner context to understand learner needs and ensure effective learning. For this reason, it is essential to study the reality of current learners, focusing on the learner context, which can prepare teachers for future primary education. This approach utilizes digital media through diverse learning, electronic multimedia, new media, and the use of appropriate technology to promote understanding of teaching content. Learners can explore, explore, experiment, and learn through action, which will lead to learning. This approach will be beneficial to educational personnel, academics, researchers, and anyone interested in using it as a guideline for further research.

Research Objectives

1. To enable teachers to organize digital learning for Thai undergraduate students
2. To promote computational thinking skills in the Suan Dusit University context

Conceptual Framework

From the study of documents and research related to the research, it is possible to summarize the concept of learning management.

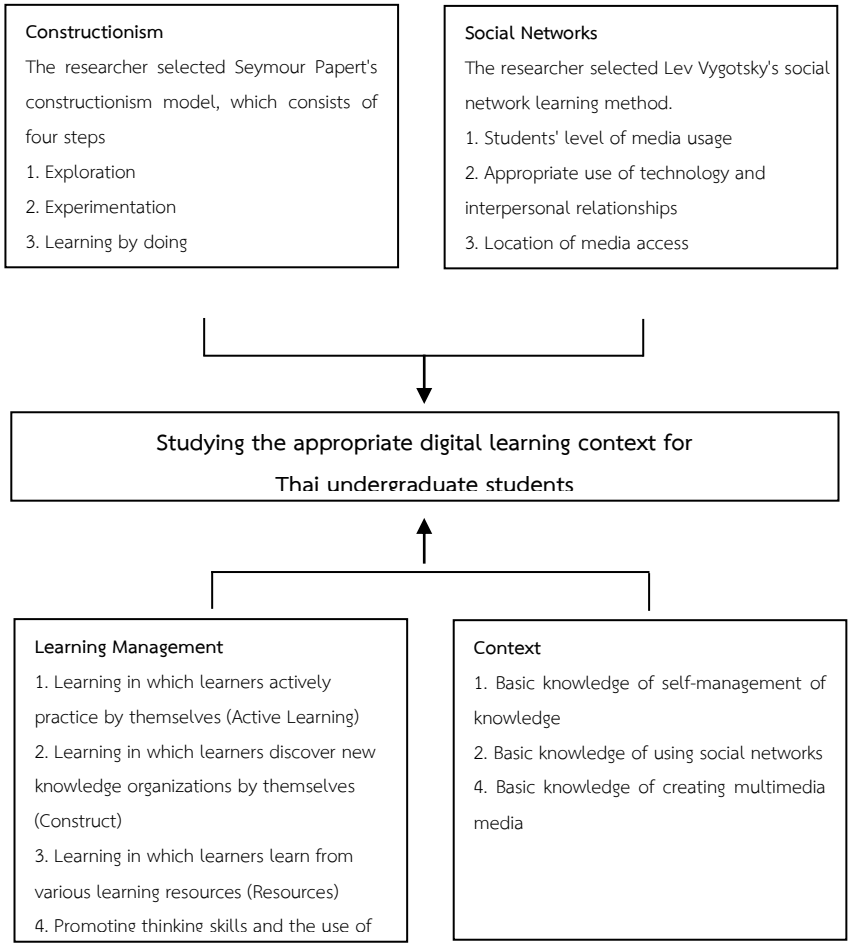


Figure 1 Conceptual framework and research theory

Research methods

1. Research Design This contextual study focused on university students' opinions on the use of digital media to promote knowledge creation. This descriptive study aimed to identify current learner behaviors. The contextual assessment aimed to collect data on student opinions regarding digital media, content, knowledge creation, and knowledge exchange.

2. Participants The researcher selected a purposive sample group to participate in this study. There were 25 Thai undergraduate students studying in the Faculty of Management Science, 2nd year, who registered for the Management Information System course, or 4th year student teachers of the Faculty of Education, 1st semester, academic year 2025. The students had mixed knowledge and ability levels, and received permission from the students' advisor and verbal consent from the participants.

3. Tools The tools used for document research include

3.1 Review and analyze documents to create a conceptual framework and develop a record form by creating a document review and analysis record form to create a theoretical framework for use in document review and analysis. The principles of theory and related research include the analysis of principles and theories related to learning theories, such as constructionism theory, teaching science, digital media theory (Vygotsky, 1978), and contextual conditions related to teaching management.

3.2 The Document Analysis Log/Checklist was developed using a Likert-type scale. A clear conceptual framework was established to enable the creation of checklists consistent with the objectives of the document analysis.

3.3 Validity: The document analysis and review were conducted by experts with specialized qualifications and experience in digital media use and computational thinking skills in related content and conceptual frameworks. The experts reviewed the consistency between the items in the logs and the conceptual framework used in the logs' development and provided suggestions for improvements to enhance the logs' comprehensiveness and appropriateness. The revised logs were then presented to measurement and evaluation experts to assess the logs' quality in terms of content validity and suitability for use.

3.4 Reliability of research instruments, such as logs or questionnaires, was assessed by examining the validity and consistency between the items in the logs and the conceptual framework used in the logs' development, and incorporating the feedback received for further improvement. This process emphasizes the consistency and precision of the instruments in measuring their intended measurements.

4. Validation The questionnaire was validated by three experts with experience and expertise in the use of digital media to promote knowledge creation. The experts jointly assessed the consistency of the questions with the content of the questionnaire, the appropriateness of the wording, the clarity of the language, and the ability to measure the

research objectives. Questions were deleted, added, or revised based on the experts' suggestions to ensure the instrument was more appropriate and comprehensive.

The researchers further reviewed the developed items, considering the clarity of the language, the appropriateness of the answer options (true/false), and the ability to truly measure the expected learning outcomes. The questionnaire was revised based on the consensus of the majority of experts to ensure a valid and appropriate instrument for the study context. The guidelines for instrument development in pilot-level learning research (Greenhow and Burton, 2011; Havi and Samaha, 2017) were also referenced.

5. Data Collection and Analysis Methods

5.1 Data Collection and Analysis Methods: Data were collected through document analysis, synthesizing data from relevant research using a theoretical framework. The researchers collected data based on relevant theoretical principles and research. To record in the audit log by analyzing documents and data analysis, it is an analytical description and interpretive summary, analysis of the context of the learning environment of the students.

5.2 The researcher collected data by having students complete a survey to analyze their opinions regarding the teaching context. Data were analyzed through analytical and interpretative descriptions. The conceptual framework for designing learning activities was synthesised based on theoretical foundations and the context of teaching and learning. Data was recorded in a data synthesis and analysis logbook using analytical and interpretative descriptions. Learning activity design and development: The researcher collected data from the conceptual framework for designing learning activities to design learning activity components. This was used to create, modify, and analyze data through analytical descriptions and interpretative descriptions. Learning activity quality assessments were conducted.

Student data were collected through a contextual survey. The objective was to collect information on student opinions regarding the use of digital media to enhance learning. Quality assessments were performed, and evaluation results were recorded in a quality assessment form. Data was analyzed through analytical descriptions and interpretative descriptions. Learning stakeholders' characteristics included student development.

5.3 The researcher collected data by having participants in the learning design and development process complete a survey on student characteristics, followed by analytical descriptions and interpretative descriptions. The researcher also interviewed both learning designers and developers. The designers analyzed learner needs in various formats to facilitate the acquisition of necessary knowledge, skills, and attitudes. This approach can be applied

practically in real life, emphasizing learner-centered learning. Learning developers will create conditions and processes that foster learning, create an atmosphere, and guide learners to achieve their full potential. They will encourage learners to think, analyze, and create new knowledge through participation and hands-on practice. This approach involves recording interviews about the learning design and development process, analyzing data through narrative analysis, and summarizing and interpreting the data collection process.

6. Quantitative Data Analysis Data from questionnaires were analyzed using a Likert scale, using descriptive analysis to describe data characteristics, and using means and standard deviations to summarize and interpret the data analysis Students used YouTube, Facebook, Instagram, Twitter, and Email.

Research Results

Table 1. Digital media use by students

No.	Level of demand for digital media selection	Percentage
The level of use of various types of digital media by students		
1	YouTube	41.15
2	Facebook	26.20
3	Twitter	17.64
4	Instagram	17.62
5	Email	12.50
The level of demand for digital media use in learning management		
1	YouTube	41.15
2	Facebook	26.20
3	Email	15.71
A place to access digital media		
1	Residence	45.00
2	University	17.35
3	Public	13.17

The level of digital media usage of students found that students chose to use YouTube the most, followed by Facebook, Instagram, Twitter, and Email, respectively. The digital media used for learning management was YouTube, followed by Facebook and Email, respectively. The places where students could access digital media the most were found to be at their residences, at a high level, followed by accessing media from universities and accessing media from public places, respectively.

Table 2. Use of digital media to promote knowledge creation

No.	The level of student needs in promoting knowledge creation	Percentage
Using digital media to promote knowledge creation		
1	Used for exchanging knowledge content via digital media with fellow members	98.50
2	Used in the learning, teaching, and assessment process	98.05
3	Used for exchanging knowledge for use in daily life	96.40
4	Used for learning content through digital media	94.80
Using digital media to promote knowledge gained from exploration		
1	Using digital media to exchange and learn information from other members' experiences	95.54
2	Using digital media to exchange knowledge and research according to one's interests, aptitudes, and abilities.	94.16
3	Using digital media to exchange knowledge after research	94.02
The use of digital media in promoting experimental results		
1	Using digital media to exchange knowledge in designing experiments to align with the hypotheses to be examined	95.55
2	Using digital media to exchange knowledge during the experiment	94.79
3	Using digital media to exchange knowledge and record experimental results	93.25
Using digital media for learning by doing		
1	Using digital media to exchange knowledge for easier access to information sources	97.85
2	Using digital media to exchange knowledge in solving work-related problems	95.93
Using digital media to doing by learning		
1	Using digital media to exchange knowledge and create motivation to do by learning	96.90
2	Using digital media to exchange knowledge for application in daily life	96.50

Students expressed the highest level of agreement with the use of digital media to promote knowledge creation. This was followed by use in learning, teaching, and assessment processes, using digital media for everyday learning, learning through digital media, teamwork, and self-directed learning. Regarding the use of digital media to promote knowledge acquisition through exploration, students expressed their preference for digital media to share and learn information based on the experiences of other members.

Digital media was used to share and learn information based on the experiences of other members, followed by the use of digital media for learning and research based on interests, aptitudes, and abilities, and the use of digital media for learning and research after research, respectively.

The use of digital media in promoting the results from the experiment found that students wanted to use digital media to exchange knowledge in designing experiments, to be consistent with the hypothesis that they wanted to examine the most, followed by the use of digital media to exchange knowledge during the experiment.

The use of digital media in exchanging knowledge and recording the results of experiments. The use of digital media in learning by doing (Learning by doing) found that students wanted to use digital media in exchanging knowledge for easier access to information sources and the use of digital media in exchanging knowledge to solve problems from work, respectively. The use of digital media in doing to create learning (Doing by learning) found that students wanted to use digital media in exchanging knowledge until they were motivated to act to create learning, and the use of digital media in exchanging knowledge to be able to apply it to their daily lives.

From the results of this research, it is shown that studying the context of learners using digital media results in quality learning. Learners understand the learning content, can explore, experiment, learn from doing, and make learners learn (Stahl, Koschmann, and Suthers 2006: 409-426; Yücel and Usluel, 2016: 97, 31–48). Learning assessment and planning for future work are also important. Therefore, it can be concluded that studying the context of digital media use helps promote knowledge creation and the better exchange of knowledge

Discussion

A contextual study revealed that students utilized various forms of digital media, with YouTube being the most popular, followed by Facebook, Instagram, Twitter, and email, respectively. Students' preferred digital media for learning management included YouTube, Facebook, and email. Regarding the location of digital media access, students accessed media most frequently at home, followed by universities and public places, respectively. Students' use of digital media for learning aligns with (Vygotsky, 1978) emphasis on the role of the social environment in promoting learning, and with (Grasha and Reichmann's, 2006) emphasis on learners' diverse learning styles and media needs. The results of students' digital media use reflect their adaptation to readily accessible technology, the needs of diverse learning styles,

and the changing social context. The choice of media types is not random, but is influenced by learner characteristics, the enabling environment, and the role of media in meeting learning goals.

The study found that students expressed the highest level of support for the use of digital media for sharing content with peers. This reflects the role of digital media in creating collaborative learning spaces, including content sharing with peers, use in the learning process, teaching, and assessment. Applying the knowledge exchanged to daily life, learning content through digital media, teamwork, and self-directed learning.

Furthermore, the results of the exploration process revealed that students prefer to use digital media to share information and experiences with other members, emphasizing the importance of participatory learning and learning from others' real experiences.

Students' current digital media use tends to involve various platforms, including YouTube, Facebook, Instagram, Twitter, and email. This is consistent with the findings of (Ahn et al., 2016), which indicate that these platforms are popular among students. The most common locations for students to access digital media are residences, universities, and public places. This aligns with (Vygotsky, 1978; Grasha and Reichmann, 2006). research, which indicates that diverse learning environments influence learner learning behavior. Regarding the use of digital media to promote knowledge creation, students utilize these media for sharing content with peers, teaching and assessment, and for practical application in daily life, teamwork, and self-directed learning. This is consistent with research by (Greenhow and Burton, 2011: 45, 223-245; Quinn, 2016: 582-600), and that emphasized the role of digital media as a tool to support learning processes in the digital age. (Hussain, Cakir, and Candeger, 2018: 281-296).

The use of digital media plays an important role in promoting students' knowledge, consistent with each step of the learning process. The following are examples: In the exploration step, students use digital media to exchange and learn from others' experiences, including searching for information based on their interests, aptitudes, and individual abilities. Digital media is a tool that facilitates more efficient access and sharing of information. In the experiment step, students participate in designing experiments using digital media to exchange ideas in line with the hypothesis to be tested. They also use digital media during the experiment, record results, and summarize the results together. In the learning by doing step, students use digital media to access information sources conveniently and quickly. It also serves as a channel for exchanging knowledge about solving problems arising from actual practice. This type of learning is consistent with the concepts of (Stahl, Koschmann, and Suthers, 2006: 409-

426; Yücel and Usluel, 2016; Papert, 1999) and the doing by learning step. The use of digital media at this step motivates students to take action to learn, which can then be applied to their daily lives. This idea is consistent with (Vygotsky, 1978) theory of social development. However, it is subject to limitations of the sample size (25 people) and its potential impact on the conclusions.

Conclusion

This contextual study demonstrates that students' learning through digital media requires appropriate technology to connect with others and access media. Students utilized YouTube, Facebook, and email as their learning tools. They accessed media from both their homes and public spaces, consistent with (Ahn et al, 2016), to build their knowledge. The process involved simple, practical knowledge creation, enabling students to think, explore, and research information. Digital media was used to exchange and learn from their experiences. Digital media was used to facilitate learning through experimentation and hands-on learning activities. Students had the freedom to make decisions and learn to solve problems on their own. This knowledge creation enabled students to participate in every step of the knowledge creation process. Students were willing to learn together and felt proud of themselves. This resulted in students being able to learn diverse, comprehensive, and easily comprehensible content, effectively aligning with Thailand's educational reform policy for developing teaching and learning models for the 4.0 era.

Recommendations

1. Since students primarily use YouTube, Facebook, and email for learning, platform-based learning activities should be designed to promote computational thinking and knowledge creation.

2. Since students desire to share knowledge and learn from others' experiences, and utilize digital media to design and share knowledge during experiments, group projects should be encouraged using social media as a channel for exchanging data and experimental results.

3. Instructors should explore new technologies, such as block-based programming platforms like Scratch, Blockly, or Tynker, which are ideal for beginning computational thinking skills, especially for students with no prior programming background.

4. Suggest studies with larger sample groups or in different contexts to validate the results, or conduct in-depth studies on specific digital platforms in the future.

New Insights from the Research

1. The use of digital media to promote knowledge creation based on Vygotsky's theory of digital media and contextual learning can be applied to the exchange of digital learning content obtained through exploration and truly meet the needs of the learners.

2. Students have a wide range of digital media usage options, such as YouTube, Facebook, Instagram, Twitter, and email. They can equally benefit from digital media for learning, and are encouraged to improve digital media according to their needs.

3. Students utilize digital media in the learning, teaching, and assessment processes, in their daily lives, to learn content through digital media through teamwork and self-directed problem-solving.

4. Students participate in the use of digital media in designing experiments to align with the hypotheses they wish to examine. Digital media is used for learning exchanges during experiments, and digital media is used for learning exchanges.

5. The study of the learner context reveals that digital media use results in high-quality learning. Learners understand learning content, can explore, experiment, learn by doing, and engage in action-based learning.



Figure 2 New Insights from the Research

Conclusion

This study indicates that students need appropriate technology to connect people and places to access media and learning tools. Students utilize various types of digital media, such as YouTube, Facebook, and email, to communicate and exchange information with others. These media can be accessed from their homes and public places. This aligns with the research of (Ahn and Pauw, 2016). Students use digital media to construct their own knowledge through

a clear, easy-to-understand, and practical process. This process provides students with opportunities to think, analyze, explore, and research information on their own, as well as to exchange knowledge through direct experiences, emphasizing experimentation and hands-on learning activities. Students also have the freedom to make decisions and solve problems on their own, resulting in genuine participation in every step of the knowledge construction process. They also demonstrate a willingness to learn collaboratively, fostering self-esteem. All of this allows students to learn diverse, comprehensive, and easily comprehensible content, effectively responding to Thailand's educational reform policy in developing teaching models for the Thailand 4.0 era.

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