Effects of AL-MIAP-based Learning Management to Promote Digital Intelligence for Undergraduate Students

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Abstract

This paper has two main aims: the first is to study pre- and post- leaning achievement utilizing AL MIAP to promote copyright digital intelligence for Suan Suan Sunandha Rajabhat University undergraduate students; and the three is to investigate the appropriateness of leaning management adopting an AL MIAP leaning model to promote the students' digital intelligence. An AL MIAP learning model was utilized in the processes to promote five digital intelligence skills, i.e., respecting copyright, prevention, checking before sharing, threat awareness and using safely. Fifty-eight Suan Sunandha Rajabhat University undergraduate students in the three-year enrolled in the introduction to digital economy course and were selected in a sample group. The tools were: Kahoot!, Google Forms, content network chart, pre- and post-test, digital media copyright test and the AL MIAP learning model. Percentage, mean, S.D, and T-test were applied in the research. The study revealed that the post-learning achievement was better that the pre-learning achievement with statistical significance at 0.01; the students gained total scores of 17.06, which was 7.16 points higher than the pre-learning scores, signifying that their digital intelligence skills were better. As for AL MIAP leaning model, it revealed that this model was appropriate at the highest level.

Keywords: Learning Management; Active Learning Management; AL MIAP Learning Model; Digital Intelligence and Copyright Literacy

1. Introduction

Investment in human resources and knowledge must be emphasized in order to aid long-term competitive capability development in Thailand; these two aspects are the supporting factors that help Thailand advance into the future. They also shape the ways and development path in alignment with shifting trends in technology, demography and environmental, geopolitics and geopolitical power shifting, etc. The investment must emphasize a foundation for long-term and further development, rather than a short-term one. It must also emphasize human development to foster knowledge and skills in conformity with ways of working and life in the 21st century. Constructivism based on fields of research that Thailand has the potential and development of large infrastructure to support research and innovation in order to allow self-development of technology and innovation in Thailand. This will pave the way to becoming a leader in fields of research such as reducing foreign resource dependency, lowering technology import, which causes economic deficit (budget deficit), building up long-term competitive capability with other nations, and for raising Thailand to stand with developed countries (National Council for Higher Education, Science, 2019)

According to educational management, instructional methodologies or models that are in alignment with the National Scheme of Education should be developed by applying advanced technology to current circumstances to encourage copyright digital intelligence. This development is in accordance with the rapidly changing learning management environment of the 21st century. As (Chuangprakhon, S., Santaveesuk, P., & Nilsook, 2018) put it, "a successful person or a person that can sustainably live their live in the modern world must possess a strong will, strength and wide creative ideas and he/she must have good wit, be well-versed, capable to think on their feet and must be constructivist throughout their life". Learners must be capable of adapting their methods of applying technology to support learning in conformity with a study conducted by Toda, Valle, & Isotani, (2018), which emphasized that a person that aims to apply technology needs to constantly improve their knowledge to improve learning processes. Nevertheless, digital knowledge is not sufficient to dictate digital citizenship. According to (Gómez-Ejerique & López-Cantos, 2019), critical thinking is essential for the digital society as leaners need the knowledge to improve

discretionary usage and thinking; therefore, information technology and supporting skills are necessary to academic literature related to knowledge concerning privacy and internet safety, creativity, ethics and responsibility (Kaeophanuek, Na-songkhla, & Nilsook, 2019).

Digital intelligence quotient is ″the sum of social, emotional, and cognitive abilities that enable individuals to face the challenges and adapt to the demands of life in the digital world″. In other words, it includes knowledge, skills, attitude, and values necessary to a life in the digital world or communication skills and social online access. The quotient is a study and development by the DQ institute, which is an agency established through collaboration between public and private sectors around the world and the World Economic Forum. It aims to allow all children in every country to receive education, to have fine digital citizen skills and to live their digital life safely. With rapid, free and borderless communication, children and juveniles born in the IT era are surrounded with digital devices and the internet; therefore, by the nature of such communication with seeming anonymity (no face-to-face contact), this makes their perception and way of life different from previous generations. Even though the digital devices and internet offer convenience, there are some dangers such as health, technological addiction (if excessively used) or online crime, cyber threats, and cyberbullying. As such, citizens-to-be must be able to keep up with the media and information, and possess digital intelligence skills to be able to live in an online society and real life without harming them or others. Their family, school, public sector, and relevant agencies must uplift the juvenile to be a digital citizen, possessing knowledge and understanding of internet usage. This consists of eight elements: (1) personal data protection, (2) good critical thinking skills, (3) personal history data management, (4) ethical technology usage, (5) personal data safety, (6) cyber threats countermeasures, (7) time management, and (8) good identity protection (Media., 2018)

In light of this, we conducted a study on learning management by adopting an AL MIAP model to identify results in order to promote copyright digital intelligence in Suan Sunandha Rajabhat University undergraduate students. An AL MIAP model was mainly utilized, and it consisted of four processes: motivation, information, application and progress (Jabtien, 2015).

Active learning was also applied; this consisted of six main focuses: (1) brain development such as thinking, problem solving, knowledge application, (2) participatory learning, (3) knowledge construction and learning management, (4) instructional participation, knowledge construction, interaction and cooperation in collaborative rather than competitive ways, (5) co-responsibility and discipline, and task assignment, and (6) simulation for reading, speaking, listening and thinking (Phutthikun, 2015), which were also utilized in learning activities. In addition, two sets of digital intelligence skills were applied in the instructional design: (1) good identity protection, and (2) personal data protection to promote digital intelligence in learners, making them able to keep up with digital media copyright and use such media safely.

2. MIAP′s Principles and Theories

A MIAP teaching technique consisted of four processes:

Step 1: motivation: motivating the interest of learners, i.e. clear introduction to the title and objectives with instructional materials for motivating their interest, spending the time concisely, encouraging learners in the class to collaborate and a conclusion to guide learners into the next step, suitably and relevantly.

Step 2: information, i**.e.** learners obtained knowledge from textbooks, self-learning, meta skills by obtaining information from several resources, teaching aids and planning a step from providing less and easier knowledge to more and harder ones.

Step 3: application, i**.e.** applying the obtained knowledge, allowing an experiment/simulation after obtaining the content in order to measure how well leaners retain such knowledge (obtaining less or more), memory review to prevent data loss, aiding learning development by urging the use of intellectual power and problem solving in learning and promoting learning transfer.

Step 4: progress: evaluating the learning achievement, i.e. evaluating learning outcome or progress, measuring and assessing outcomes − skills, behaviors, knowledge and attitude

3. Principles and Theories of Active Learning

Active learning processes:

1) Brain power development, i.e. thinking, problem solving and knowledge application;

2) Participatory learning;

3) Knowledge construction and learning management system created by learners;

4) Classroom participation, knowledge construction, interaction, cooperation in collaborative rather than competitive ways;

5) Co-responsibility, discipline and task assignment;

6) Simulation for reading, speaking, listening and thinking;

7) Higher order thinking skills;

8) An opportunity for integration of data, news and information and principles to create concepts;

9) Learning management facilitated by teacher in order to allow self-learning by learners;

10) Experience- based knowledge, knowledge construction, conclusion and review by learners.

4. Digital Intelligence Quotient (DQ)

The digital intelligence quotient is the sum of the social, emotional and cognitive abilities that enable individuals to face the challenges and adapt to the demands of life in the digital world. The scope of digital intelligence covers necessary knowledge, skills, attitude and values for a digital life – in other words a communication skill and online socialization.

Two digital intelligence skills were applied in the instruction:

1) Digital citizen identity protection: this is a skill of good online and real-world identity creation and management. Good identity means the capability of a digital media user to build a positive identity, i.e. thought, feeling and action with discretion about data communication and commentary, to sympathize with social media users, to take responsibility for their actions and to act in accordance with laws and online ethics, e.g., respecting copyright, no cyberbullying or hate speech.

2) Privacy management: this is a skill regarding discretion about personal data management, online personal data protection, especially online sharing to prevent privacy breaches, internet literacy – threats, i.e., malware, viruses, and internet fraud.
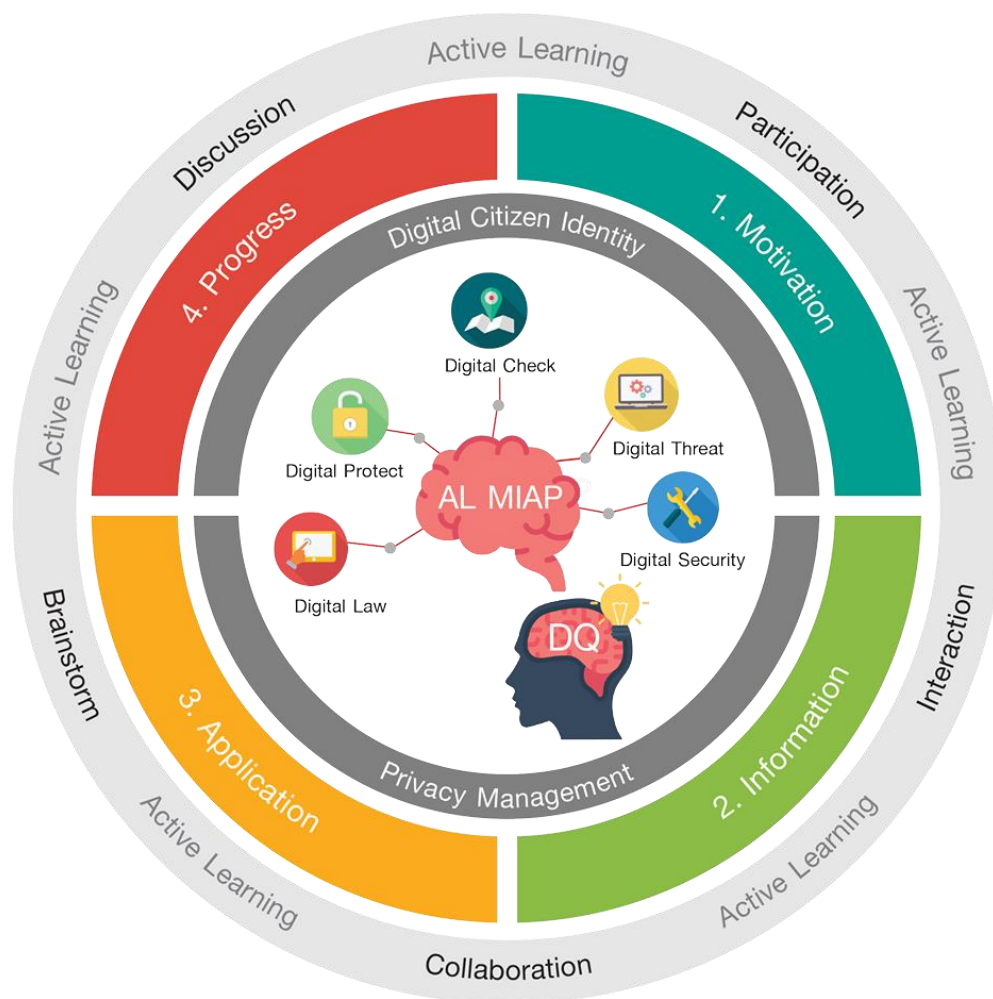
Figure 1. AL MIAP learning model

5. Processes

Four Processes were divided as follows:

Step 1: motivation: 15 minutes for introduction, informing about the course and lesson objectives before proceeding with the lecture, pre‑testing before learning with Kahoot! to create a participatory atmosphere.

Step 2: information: 1:30 hours for course introduction, discussion and presentation by PowerPoint; Q&A in certain parts to create interaction between the class.

Step 3: application: 30 minutes for brainstorming by a group, each of which consists of 5-7 learners, Google slides utilized with creative commons (CC) license required in order to encourage teamwork, discussion and exchange of ideas, and to determine the rights which usages are allowed for recipients as follows:

1. Digital law: respecting copyright, identity or property or works created by third party to distribute in digital format.

2. Digital protect: personal data protection, preventing a person with malicious intent from the digital world.

3. Digital check: checking before sharing, and sharing personal data with caution.

4. Digital threat: learning internet threats.

5. Digital security: using safely, and knowing how to secure data and digital devices.

Step 4: progress: five minutes for class presentation, Q&A by classmates and teachers, checking the completed work, assessing digital intelligence in the presenting group to encourage discussion, explicit self-expression and doing digital intelligence questionnaire via Google forms.

6. Objectives

1) To study pre- and post- leaning achievement by utilizing AL MIAP to promote copyright digital intelligence for SSRU′s undergraduate students;

2) To investigate the appropriateness of leaning management adopting an AL MIAP leaning model to promote the students′ digital literacy.

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7. Delimitation

1) Population and sample group

Population (N): undergraduate students, information science, Suan Suan Sunandha Rajabhat University

Sample group = 58 undergraduate students (3rd year) enrolled in the introduction to digital economy course, Suan Suan Sunandha Rajabhat University

2) Study variables

Independent variable: AL MIAP-based learning management

Dependent variable: digital intelligence promotion

8. Tool design

Tools consisted of the following:

1) AL MIAP learning model

2) Pre- and post-testing: digital intelligence – digital copyright test (20 questions)

3) AL MIAP evaluation forms of the introduction to digital economy course to promote digital intelligence

A 5-item Likert scale was used to evaluate all four processes (motivation, information, application and progress) was applied. The scale was as follows:

Scale	Comment/appropriateness
5	Highest
4	High
3	Moderate
2	Low
1	Poor

Interpretation was interval as follows:

Average	Comment/appropriateness
4.50-5.00	Highest
3.50-4.49	High
2.50-3.49	Moderate
1.50-2.49	Low
1.00-1.49	Poor

Research processes of AL MIAP learning model

Step 1: motivation: 15 minutes for introduction, informing the course and lesson objectives before proceeding with lecture, pre-testing before learning with Kahoot to create participatory atmosphere

Step 2: information: 1:30 hours for course introduction, discussion and presentation by PowerPoint, Q&A in certain parts to create interaction in the class.

Step 3: application: 30 minutes for brainstorming by a group each of which consists of 5-7 learners, google slides utilized with CC (Creative commons) license required in order to

encourage teamwork, discussion and exchange of ideas and to determine the rights which usages are allowed for recipients; there were 5 topics as follows:

1. Digital low: respecting copyright, identity or property or works created by third party to distribute in digital format

2. Digital protect: personal data protection, preventing a person with malicious intent from the digital world

3. Digital check: checking before sharing and sharing personal data with caution

4. Digital threat: learning internet threats

5. Digital security: using safely and know how to secure data and digital devices

Step 4: progress: 5 minutes for class presentation, Q&A by classmates and teachers, checking finished works, assessing digital intelligence in the presenting group to encourage discussion, explicit self-expression and doing digital intelligence questionnaire via Google forms

4) Kahoot! And Google Forms

Kahoot! is a game-based learning platform that allows learners to do quizzes; learners must answer the questions quickly and correctly. The created game is accessed by a smart-phone or computer connected to the internet; it is played individually and in competition with the whole class. The total score is displayed after finishing the game (leaners know how well they fared instantly); then, all results (as completed by all learners) are finalized to identify the highest and lowest scores. This game allows the learners to compete with themselves and their classmates, to have a good time and to participate in activities in class.

Google forms is a survey administration application for creating a test with questions and answers. This application can check what choices learners have chosen or what answer they submit; at the same time, they can also see what the correct choices/answers are. Total scores are displayed and can be set to display the true answer; moreover, the application provides a comparative data graph to compare each question and overall test. This enables the teacher to check whether the test is too hard or easy.

9. Results

The pre- and post-learning achievement of the 58 undergraduate students (2nd year) by applying AL MIAP is shown in Table 1:

Table 1. Comparison of learning achievement between pre-learning achievement and post-learning achievement from 58 undergraduate students (2nd year) with AL MIAP learning model.

Score	Full score	$\bar{x}$	S.D.	t-test	Sig.
Pre-learning	20	9.90	1.49	21.15	.01
Post-learning	20	17.06	0.94		

**p< .01

According to Table 1, the learning achievement of the 58 undergraduate students (3nd year) with the AL MIAP learning model to promote digital intelligence is better in the post-learning period than the pre-learning period, with statistical significance at 0.01; the total score is 17.06, signifying that the digital intelligence of learners increased by 7.16 points. In conclusion, using an AL MIAP learning management to promote digital intelligence can increase the score.

Table 2. AL MIAP AL MIAL learning model evaluation

Descriptions	$\bar{x}$	S.D	Interpretation
Step :1motivation - Inform learning goals - Pre-test by Kahoot	5.00	0.00	Highest

Descriptions	x̄	S.D	Interpretation
- Conclude before introduction into the lessons			
Step :2information - Explain course details - Establish topic for discussion related to digital intelligence - Q&A	4.75	0.50	Highest
Step :3application - Identify problems and give an assignment - Explain how to use Google slides - Describe how to create CC - Assign group tasks, create works by using Google slides and apply CC license	4.25	0.50	High
Step 4: progress - Presentation - Check and evaluate completed works - Inquire and exchange ideas based on presented works - Post-test to evaluate at the end of the class	4.50	0.58	Highest
Total	**4.63**	**0.39**	**Highest**

Based on Table 2, the appropriateness of an AL MIAP learning model applied to promote digital intelligence of the students is highest (x̄ = 4.63, S.D. = 0.39).

10. Conclusion

Based on the objectives, it was concluded that:

1) In regard to pre- and post-learning management with an AL MIAP model to promote digital intelligence of SSRU′s undergraduate students, based on the pre- and post-test (20 points), post-learning achievement was higher than the pre-learning period, with statistical significance at 0.01 (total score: 17.06); this signifies better digital intelligence (average score 7.16 increased). This shows that an AL MIAP learning model is able to promote a better score (digital intelligence).

2) Based on an evaluation on the four processes (AL MIAP) by four experts, the appropriateness of learning management with an AL MIAP model to promote digital intelligence of SSRU′s undergraduate students was of the highest level ($\bar{x}$ = 4.63, S.D. = 0.39); the MIAP (motivation, information, application, progress) was assessed as follows:

2.1) Mean of appropriateness from step 1 (motivation) was of the highest level ($\bar{x}$ = 5.00, S.D. = 0.00);

2.2) Mean of appropriateness from step 2 (information) was of the highest level ($\bar{x}$ = 4.75, S.D. = 0.50);

2.3) Mean of appropriateness from step 3 (application) was of the highest level ($\bar{x}$ = 4.25, S.D. = 0.50);

2.4) Mean of appropriateness from step 4 (progress) was of the highest level ($\bar{x}$ = 4.75, S.D. = 0.50).

11. Discussion

According to the study, post-learning achievement was better than pre-learning achievement, with statistical significance at 0.01 (total score: 17.06), thus signifying better digital intelligence (average score increased to 7.16); this is in line with a study conducted by Lerdrungporn, P., Wattananarong, K., & Wiriyanon, (2017), which compared the learning

achievement (average score) of students′ learning with instructional management for touch-screen computers and students′ learning with conventional methods using independent T-tests (two sample groups); the comparison showed statistically significant difference at 0.05; (Alanazi, 2020) thus, the T-test was feasible in the study.

Second, according to the study, appropriateness was highest ($\bar{x} = 4.63$, S.D. = 0.39); this is in line with a study on an instructional model of map on cloud computing technology of the undergraduate students in order to promote 21st century learning skills conducted by Thanachawengsakul, N., & Jeerungsuwan, (2019); they revealed that the appropriateness was of the highest level ($\bar{x} = 4.90$, S.D. = 0.32). Further, a study conducted by Leela, S, Chookkaew, S. & Nilsuk, (2019) revealed that the appropriateness of micro learning management development by utilizing living books to promote computational thinking was of the highest level ($\bar{x} = 4.60$, S.D. = 0.51) by applying multimedia, image, video, freeware and gameplay as the channels for instructional management; this also emphasized the that the activities conformed to the learners' skills to encourage copyright digital intelligence and class participation. This kind of instructional management was different from original MIAP, as it focused on activities and learning in a class only due to limitations of the premise causing learners to come to learn in the university.

12. Suggestions

The suggestions are as follows:

1) It is important to raise the student's awareness of CC license to use image or media in the assigned works created with Google slides.

2) In application process, simulation related to lessons may be feasible to allow the students to learn in practical way i.e., assigning tasks for student to design a business model with a simulation of copyright infringement and solution, etc.

3) Rubric score should be applied for checking the completed works

4) Video with current interesting topics should be added for encouraging an analytical cooperation, class discussion between students and for allowing them to get a bigger picture.

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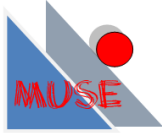
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