

The Inquiry Based Learning Platform with Generative Artificial Intelligence to Promote Remembering and Understanding Skills for Dental Public Health Students

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Abstract

The objective of this research is to develop the architecture of the inquiry based learning platform with Generative AI (IBL platform with Gen-AI) in order to promote remembering and understanding skills for dental public health students. The platform developed in this research is based mainly on the principles of inquiry based learning, which consists of five steps (i.e., engagement, exploration, explanation, elaboration, and evaluation), combined with the technology of Generative AI. Thus, the platform herein is capable of creating new and unprecedented contents by means of the learning style that focuses mainly on participatory learning. It is expected that this method of learning assists learners in the enhancement of the skills related to thinking, remembering, and understanding, which can further promote intelligence quotient in terms of cognitive domain, highly necessary in the learning society in this digital era. The suitability of the architecture of the IBL platform with Gen-AI was assessed by nine experts with specialized in the dental anatomy, and information technology. The research results show that the overall suitability of the elements towards the architecture of the IBL platform with Gen-AI is at highest level. It can be summarized that the guideline to further develop the IBL platform with Gen-AI to promote remembering and understanding skills for dental public health students through web applications.

Keywords: Inquiry based learning platform with Generative AI, IBL platform with Gen-AI, Inquiry based learning, generative artificial intelligence, remembering and understanding skills, dental public health students

1. Introduction

The strategy of digital health has brought about positive changes in both the quality and sustainability of the healthcare system. The effective use of digital technology can save more lives, improve people's health and well-being, support the health system in a more sustainable manner, and deliver safe, high-quality and effective health services for all people in Thailand. It is also widely accepted that the application of digital technology in health issues is highly significant to the health system as it facilitates better operations of the health system and at the meantime strengthens the potentiality of personnel in this field, which is considered a part of transition to integrated and person-centered care (Ministry of Public Health, 2021).

According to the 21st century learning designated to elevate learning and innovation skills so as to prepare learners to confront the challenges of the dynamic world, technologies have been playing a pivotal role in the creation of learning methods that primarily emphasize the skills of creative thinking, collaboration and problem solving. In the field of public health, technological knowledge and health data analysis are quite essential; therefore, it is necessary for public health students in the 21st century to upgrade these skills so that they are able to adapt themselves and produce the innovations that can promote quality of life of people in a sustainable manner (Jaroensa & Sengsri, 2020). Since the students of new generation are literate in ICT and have access to a variety of information sources, the use of ICT in education systems is believed to provide them with more learning opportunities in terms of contents, methods, and accessibility (Chatwattana et al., 2022).

2. Literature Review

2.1 Inquiry Based Learning

Inquiry based learning (IBL) is a learning model in which learners can create their own bodies of knowledge by connecting their hands-on experiences with their existing knowledge and understanding in order to create their

own understanding. The learning of this kind is also regarded as a learning model that encourages learners to cogitate about various arguments and doubts, which will lead to questions that need to be examined. This will help learners learn and develop the skills concerning the search of knowledge based on scientific principles (Sreejun & Chatwattana, 2024). Whereby, the inquiry based learning process (5Es Process) comprises the following steps, i.e., engagement, exploration, explanation, elaboration, and evaluation, respectively (Pumsiro, 2022).

2.2 Generative Artificial Intelligence

Generative Artificial Intelligence (Gen-AI) is an artificial intelligence capable of creating new data or new contents automatically without human control, and it is also intended to primarily fabricate new innovations and unprecedented products (Muengsan & Chatwattana, 2024). In the past few years, the development of artificial intelligence has made such a giant leap that it is playing a greater role in many industries. The integration of AI technology with virtual reality has led to stirring changes in the education sector because this can create new learning experiences derived from student's engagement in both learning and research. It is said that this technology is going to be a significant driving force in education reform in the future (Methaneethorn, 2024).

2.3 Cognitive Domain

Cognitive domain refers to the behaviors related to intelligence, knowledge, thought, cleverness, and abilities to think effectively of the things, which are changes occurring in the brain (Ekphachaisawat, 2022). Bloom (1969) divided the intelligence quotient in terms of cognitive domain into six domain levels as follows: (1) Knowledge: It is the ability to retain and recall the experiences that have been learned. (2) Comprehension: This level is the ability to understand the main idea of media and demonstrate it by means of interpretation, prediction, elaboration, or other actions. (3) Application: This refers to the level in which learners can apply their knowledge and experiences to solve problems in different situations; thereby, both knowledge and understanding are highly required in this level. (4) Analysis: Learners can think or distinguish things into important components and realize their relationships. (5) Synthesis: It is the ability to combine small components into one thing in a systematic manner in order to create something new and more complete than the original one; and (6) Evaluation: This level refers to the ability to judge or summarize the value of things in the form of moral principles based on the appropriate rules (Faculty of Education, 2023; Kumpannat et al., 2020).

According to the principles and theories above, the researchers have had an idea to develop the architecture of the inquiry based learning platform with Generative AI with an aim to promote remembering and understanding skills for dental public health students. This study places an emphasis on the integration of technologies with the learning model that support the learning style appropriate in the 21st century. To illustrate, the learning of this kind enables learners to revise their lessons all the time by means of self-learning. At the meantime, it helps learners improve the skills of thinking, remembering, and understanding; all of these are thought to promote their intelligence quotient in terms of cognitive domain, which is essential in the learning society in such digital age like this.

This research is related to the design and development of the architecture of the IBL platform with Gen-AI to promote remembering and understanding skills for dental public health students, and the research objective and hypothesis are as follows.

- To synthesize the conceptual framework of the architecture of the IBL platform with Gen-AI to promote remembering and understanding skills for dental public health students.
- To develop the architecture of the IBL platform with Gen-AI to promote remembering and understanding skills for dental public health students.
- To study the results of the development of the architecture of the IBL platform with Gen-AI to promote remembering and understanding skills for dental public health students.

The suitability of the architecture of the IBL platform with Gen-AI to promote remembering and understanding skills for dental public health students is at the high level.

3. Methodology

This study is related to the development of the architecture of the IBL platform with Gen-AI, the researchers adhered to the concepts of systems approach (Khemmani, 2018; Utranan, 1982), which can represent the steps and the process.

3.1 Participants

The participants are nine experts from higher education institutions who are specialized in the dental anatomy, and information technology.

3.2 Tools and Data Analysis

The research tools consist of (1) the architecture of the IBL platform with Gen-AI, and (2) the evaluation form on the suitability of the architecture of the IBL platform with Gen-AI consisting of five levels scoring questions. The data analyses are mean and standard deviation (SD).

The design and development of the architecture of the IBL platform with Gen-AI can be summarized into three stages as below.

In the first stage, the researcher synthesizes the documents and researches relevant to Bachelor of Public Health Program in Dental Public Health, inquiry based learning, Generative AI, metaverse, remembering and understanding skills, in order to find out the conceptual framework of the IBL platform with Gen-AI.

In the second stage, the researcher designed the architecture of the IBL platform with Gen-AI. The researchers applied the principles of inquiry based learning along with Gen-AI technology as guidelines for the design and the development. The said elements are the following four components: (1) input factor, (2) the IBL process with Gen-AI, (3) output, and (4) feedback.

In the third stage, the researcher studied the results of the development of the architecture of the IBL platform with Gen-AI. The criteria of mean score and interpretation (Srisa-Ard, 2013) were studied at this stage.

- 4.50–5.00 p., the suitability is at the highest,
- 3.50–4.49 p., the suitability is at the high,
- 2.50–3.49 p., the suitability is at the moderate,
- 1.50–2.49 p., the suitability is at the low,
- 0.00–1.49 p., the suitability is at the lowest.

4. Results

The development of the architecture of the IBL platform with Gen-AI to promote remembering and understanding skills for dental public health students can be concluded as follows:

4.1 The Conceptual Framework of the Architecture of the IBL Platform with Gen-AI

From the synthesis of the documents and researches relevant to Bachelor of Public Health Program in Dental Public Health, inquiry based learning, Generative AI, metaverse, remembering and understanding skills, the researchers acquired the conceptual framework as seen below.

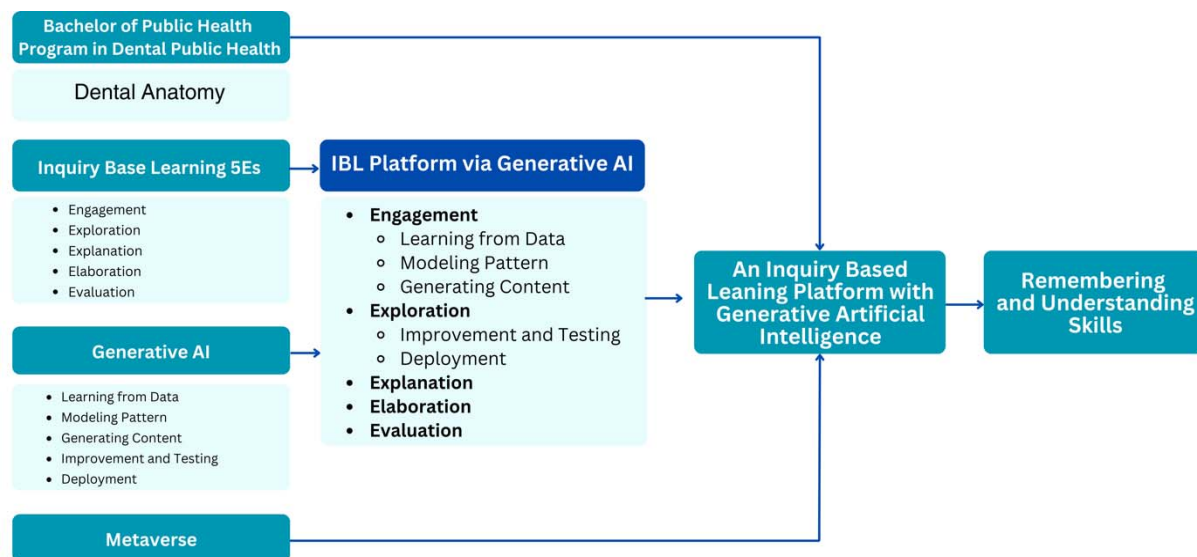


Figure 1. Conceptual framework of the architecture of the IBL platform with Gen-AI

4.2 The Development of the Architecture of the IBL Platform with Gen-AI

The architecture of the IBL platform with Gen-AI is initiated from the concepts and principles of inquiry based learning, which comprises five steps of the learning process (i.e., engagement, exploration, explanation, elaboration, and evaluation), combined with Gen-AI technology with an intention to promote remembering and understanding skills, which are considered the intelligence quotient in terms of the cognitive domain. Thereby, it is expected that the platform in this study shall enable the dental public health students to retain and recall their hands-on experiences derived from learning and perception in the Dental Anatomy Course, and then they can improve their remembering and understanding skills thereafter. The architecture of the IBL platform with Gen-AI is illustrated in Figure 2.

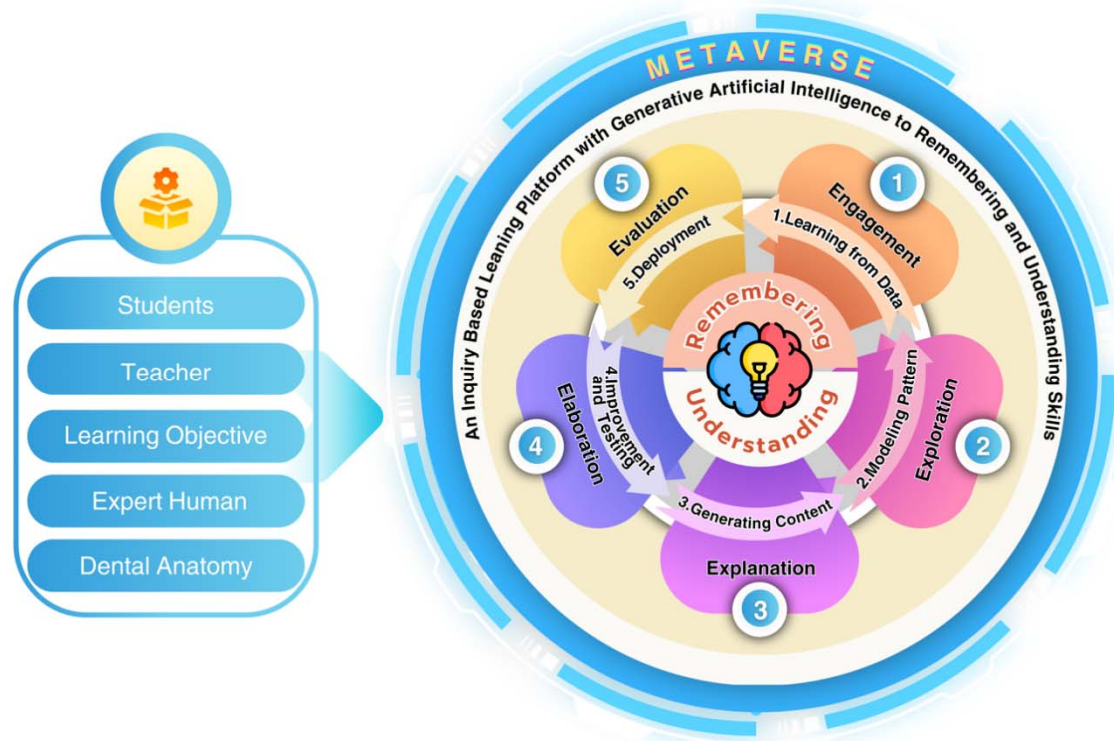


Figure 2. The Architecture of the IBL platform with Gen-AI

Figure 2 represents the architecture of the IBL platform with Gen-AI to promote remembering and understanding skills, which is composed of four main elements as below:

1) Input factor: This refers to the relevant environments and elements needed in the design and the development of the architecture of the IBL platform with Gen-AI to promote remembering and understanding skills, which include student, teacher, learning objective, expert human, and the subject contents of Dental Anatomy Course.

2) The IBL process with Gen-AI: This element is the steps of learning devised by the integration of the inquiry based learning process, the steps of Gen-AI, and metaverse. The details of this element are as follows:

① Inquiry based learning is a learning process in which learners can create new bodies of knowledge by their own by inquiring, searching, and checking data in different ways based on the thinking process and scientific process combined with the experiences from existing knowledge.

② Gen-AI is an artificial intelligence processing technology that can make non-living things equal to human-beings. However, this technology usually focuses on the creation of unprecedented innovations and products.

③ Metaverse herein refers to the application of virtual reality technology to create a learning space with an effort to enhance the skills related to dental anatomy. In the metaverse, users can create their own avatars to represent their virtual identities and learn in the virtual classroom on the website.

After conducting the study and the synthesis on the researches related to the inquiry based learning process (Pumsiro, 2022; Eiamprasert, 2020; Chunsumphao, 2021; Srisunakrua, 2023; Manishimwe et al., 2023; Mao, 2023; Berie et al., 2022; Sreejun & Chatwattana, 2023) as well as the steps of Generative AI technology (Methaneethorn, 2024; Warabuntaweesuk et al., 2024; Panitpichetvong et al., 2024; Yadav, 2024; Banh & Strobel, 2023; Stobel et al., 2024), the researchers has acquired the guideline to synthesize the inquiry based learning process with Generative AI, as seen in Table 1.

Table 1. Synthesis of the IBL process with Gen-AI

Inquiry based learning (IBL)	Generative AI (Gen-AI)	IBL process with Gen-AI
1) Engagement	1) Learning from data	1) Engagement 1.1) Learning from data 1.2) Modeling pattern 1.3) Generating content
2) Exploration	2) Modeling pattern	2) Exploration
3) Explanation	3) Generating content	3) Explanation
4) Elaboration	4) Improvement and testing	4) Elaboration
5) Evaluation	5) Deployment	5) Evaluation

Table 1 represents the synthesis of the IBL process with Gen-AI. The researchers had carried out the synthesis on the relevant documents and researches, and obtained the guidelines for use in this study, which can be summarized into the following five steps:

- Step 1 Engagement: It is about the creation of unprecedented novelties in the form of activities, which can stimulate learners to have more curiosity. There are three steps of Generative AI technology herein, i.e., learning from data, modeling pattern, and generating content.
- Step 2 Exploration: This step allows learners to explore, search, and learn by applying their own bodies of knowledge in experiments and practices. There are two steps of Generative AI technology in this stage, i.e., improvement and testing, and deployment, respectively.
- Step 3 Explanation: In this step, the data derived from exploration and search in the earlier step will be analyzed, interpreted, summarized, discussed, and then presented in different formats like drawing, table, diagram, etc. In addition, there must also be references, logical reasoning, valid and reliable conclusions, and solid evidence.
- Step 4 Elaboration: This step is about the application of knowledge gained from learning in the courses of higher levels, or the expansion of conceptual framework by linking existing knowledge to new bodies of knowledge or more researches and experimentations.
- Step 5 Evaluation: This refers to the creation of questions to measure the knowledge after learning. This is to check the accuracy of knowledge obtained from learning, which can be conducted by allowing learners to analyze, criticize, and exchange knowledge with one another.

3) Output: It is the outcomes derived from this learning process, or remembering and understanding skills, which are the ability to remember and understand what has been learned through the creation of its relationships and then demonstrate it by means of interpretation, prediction, elaboration, or other actions.

4) Feedback: This element is about the analysis of data gained from the steps of the evaluation and learning process, i.e., remembering and understanding skills. The feedback here is intended to improve the learning process so that it is compliant to the objectives of the IBL platform with Gen-AI. Also, the feedback is expected to be beneficial to the future improvement and development.

4.3 The Assessment on the Development of the Architecture of the IBL Platform with Gen-AI

The results of the development of the architecture of the IBL platform with Gen-AI, which are the study with nine experts who are specialized in the dental anatomy, and information technology. The results of the architecture of the IBL platform with Gen-AI are shown in Tables 2 and 3.

Table 2. The assessment of the development of the architecture of the IBL platform with Gen-AI (overall elements)

Items for evaluation	Results		Interpretation
	Mean	SD	
1. The suitability of the principles and the concepts used to develop the architecture of the IBL platform with Gen-AI?	4.89	0.31	Highest
2. What is the suitability of the elements of the architecture of the IBL platform with Gen-AI?			
2.1 Input factor	4.89	0.31	Highest
2.2 The IBL process with Gen-AI	4.78	0.42	Highest
2.3 Output	4.56	0.50	Highest
2.4 Feedback	4.78	0.42	Highest
Overall average	4.78	0.39	Highest

In reference to Table 2, it is found that the overall suitability of the design of the architecture of the IBL platform with Gen-AI (overall elements) is at the highest level (mean = 4.78, SD = 0.39). It can be concluded that the architecture of the IBL platform with Gen-AI consists of all necessary elements and it can be used as a guideline to further develop other IBL platform with Gen-AI in order to promote the dental public health students' remembering and understanding skills in Dental Anatomy Course.

Table 3. The assessment of the development of the architecture of the IBL platform with Gen-AI

Items for evaluation	Results		Interpretation
	Mean	SD	
1. Input factor			
1.1 Student	4.89	0.31	Highest
1.2 Teacher	4.67	0.47	Highest
1.3 Learning objective	5.00	0.00	Highest
1.4 Expert human	4.89	0.31	Highest
1.5 Dental Anatomy	5.00	0.00	Highest
2. The IBL process with Gen-AI			
2.1 Inquiry Based Learning			
2.1.1 Engagement	4.89	0.31	Highest
2.1.2 Exploration	5.00	0.00	Highest
2.1.3 Explanation	4.78	0.42	Highest
2.1.4 Elaboration	4.89	0.31	Highest
2.1.5 Evaluation	4.89	0.31	Highest
2.2 The learning process using the Gen-AI			
2.2.1 Learning from data	5.00	0.00	Highest
2.2.2 Modeling pattern	5.00	0.00	Highest
2.2.3 Generating content	4.78	0.42	Highest
2.2.4 Improvement and testing	5.00	0.00	Highest
2.2.5 Deployment	5.00	0.00	Highest
2.3 Metaverse	5.00	0.00	Highest
3. Output			
3.1 Remembering and understanding skills	4.78	0.42	Highest
4. Feedback			
4.1 Results of evaluation on remembering and understanding skills	4.67	0.47	Highest
Overall average	4.89	0.22	Highest

According to Table 3, it can be clearly seen that the overall suitability of the design of the architecture of the IBL platform with Gen-AI is at the highest level (mean = 4.89, SD = 0.22). Thus, it can be summarized that the architecture of the IBL platform with Gen-AI has all the appropriate elements and it can be applied as a guideline for the inquiry based learning. It is said that the inquiry based learning can enhance learners' remembering and understanding skills and help them remember and understand in a more efficient manner as well.

5. Conclusion & Discussion

The IBL platform with Gen-AI is based mainly on the concepts of inquiry based learning integrated with Gen-AI technology. The platform developed in this study allows learners to participate in learning facilitated in the metaverse, which is believed to help promote their remembering and understanding skills. The architecture of the

IBL platform with Gen-AI is composed of four main elements: 1) Input factor: This element consists of the student, teacher, learning objective, expert human, and the subject contents of Dental Anatomy. 2) The IBL process with Gen-AI: This learning process is composed of five steps, i.e., engagement, exploration, explanation, elaboration, and evaluation. Furthermore, the researchers also relied on the principles of Gen-AI technology with an attempt to promote remembering and understanding skills for dental public health students; thereby, Gen-AI technology comprises the steps of learning from data, modeling pattern, generating content, improvement and testing, and deployment, respectively. 3) Output: This element refers to remembering and understanding skills. 4) Feedback: This refers to the results of the assessment on remembering and understanding skills.

As to the evaluation results of the suitability of the design of the architecture of the IBL platform with Gen-AI, it is found that (1) the overall suitability of the design of the architecture of the IBL platform with Gen-AI (overall elements) is at the highest level (mean = 4.78, SD = 0.39), and (2) the overall suitability of the design of the architecture of the IBL platform with Gen-AI is at the highest level (mean = 4.89, SD = 0.22). In pursuance of the aforementioned results, it can be summarized that the architecture of the IBL platform with Gen-AI contains all appropriate elements and it can be used as a guideline to further develop other IBL platform with Gen-AI in order to promote remembering and understanding skills for dental public health students. The results above also in line with the research of Sridam et al. (2024), who stated that the adjustment of learning model along with analysis on students' behaviors will enable teachers to adjust contents and activities aligning with the needs of individual students. Meanwhile, this method can also motivate and increase learning efficiency, which shall further improve the quality of education and respond well to such digital age like today. In order to gear up the national development, therefore, the policies related to the application of artificial intelligence are considered highly important in the implementation of educational strategies and the provision of education opportunities in the country.

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Authors' contributions

Phapawee Poolsombat was responsible for study design, wrote and compose the manuscript, developing the tools and studied the results. Dr. Pinanta Chatwattana was revised and compose the writing quality of the manuscript and rechecked the manuscript before it was to be submitted. The two authors have approved the final version of this manuscript for publication.

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The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Obtained.

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The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Data sharing statement

No additional data are available.

References

Banh, L., & Strobel, G. (2023). Generative artificial intelligence. *Electronic Markets*, 33(1), 63–75.

- <https://doi.org/10.1007/s12525-023-00680-1>
- Berie, B., Damtie, D., & Bogale, Y. N. (2022). Inquiry-Based Learning in Science Education: A Content Analysis of Research Papers in Ethiopia (2010–2021). *Education Research International*, 1–10. <https://doi.org/10.1155/2022/6329643>
- Bloom, B. S. (1969). *Taxonomy of educational objectives: The classification of educational goals: Handbook I, Cognitive domain*. New York: McKay.
- Chatwattana P., Kanyawimon, S., & Jaipaitoon, M. (2022). An interactive alumni Web site on the Cloud to enhance proactive public relations. *World Transactions on Engineering and Technology Education*, 20(1), 52–59.
- Chunsumphao, O., & Khamrat, N. (2022). *The Effect of Inquiry Method on Science Subject Learning Achievement of Prathomsuksa 4 Students*. Retrieved from <https://regis.nsuru.ac.th/gtips/storage/files/archived/b6dbcaf027fef5c3.pdf>
- Eiamprasert, S. (2020). *The effects of 5e inquiry learning management with questioning technique on learning achievement and concepts in biology of grade 10 students*. Master's thesis, Burapha University, Thailand. Retrieved from <https://buuir.buu.ac.th/xmlui/handle/1234567890/9171>
- Ekphachaisawat, T., & Kitjarak, T. (2022). Approach for academic performance development by using Bloom's taxonomy. *Lawarath Social E-Journal*, 4(1), 183–202. Retrieved from <https://so04.tci-thaijo.org/index.php/lawarathjo/article/view/256930>
- Faculty of Education. (2023). *Bloom's Taxonomy of Learning*. Bangkok: Chulalongkorn University.
- Jaroensa, T., & Sengsri, S. (2020). Digital intelligence quotient and creativity and innovation skills in 21st century. *Journal for Research and Innovation, Institute of Vocational Education Bangkok*, 3(2), 21–29.
- Khemmani, T. (2018). *Science of Teaching: Knowledge of Efficient Learning Process Management*. Bangkok: Chulalongkorn University Press.
- Kumpannat, T., Koonchayanggoon, S., Punchaariyakun, S., & Pinthana, P. (2020). Cognitive learning behavior based on the concept of Bloom's revised taxonomy. *Journal of Graduate Research*, 11(2), 1–20. Retrieved from <https://so02.tci-thaijo.org/index.php/banditvijai/article/view/242749/166482>
- Manishimwe, H., Shivoga, W. A., & Nsengimana, V. (2023). Enhancing students' achievement in biology using inquiry-based learning in Rwanda. *International Journal of Evaluation and Research in Education (IJERE)*, 12(2), 809–817. <https://doi.org/10.11591/ijere.v12i2.23375>
- Mao, Y. (2023). Issues and Strategies in Inquiry-Based Learning Evaluation. *Open Journal of Social Sciences*, 11(4), 422–440. <https://doi.org/10.4236/jss.2023.114030>
- Metaneetorn, J. (2024). Generative artificial intelligence in education: The role of ChatGPT and Gemini as educational tools. *Journal of Information Technology and Innovation*, 23(1), 85–100. Retrieved from <https://so03.tci-thaijo.org/index.php/oarit/article/view/276023/184088>
- Ministry of Public Health. (2021). *Digital health strategy (2021–2025)*. Bangkok: Ministry of Public Health. Retrieved from https://ict.moph.go.th/upload_file/files/263bec94c161efb9d61d3b1116dee9a4.pdf
- Muengsan, S., & Chatwattana, P. (2024). The Game-based Learning (GbL) Platform with Generative AI to Enhance Digital and Technology Literacy Skills. *Journal of Education and Learning*, 14(1), 46–53. <https://doi.org/10.5539/hes.v14n1p46>
- Panitpichetvong, P., Phattanurakkul, C., Thatreenaranont, N., & Limyoti, A. (2023). Using of Generative Artificial Intelligence for teaching and learning in the higher education level. *Academic Journal Bangkokthonburi*, 13(1), 31–45. Retrieved from https://research.bkkthon.ac.th/abstac/ab_04092567131755.pdf
- Pumsiro, N. (2022). *The Development of the 5 E's of Inquiry-based Learning with Rojas's Problem-solving Strategy to Promote Academic Achievement on Momentum and Collision for Tenth-grade Students*. Master's thesis, Narasuan University, Thailand. Retrieved from <http://nuir.lib.nu.ac.th/dspace/handle/123456789/5686>
- Sreejun, S., & Chatwattana, P. (2023). The Imagineering Learning Model with Inquiry-Based Learning via Augmented Reality to Enhance Creative Products and Digital Empathy. *Journal of Education and Learning*, 12(2), 52–59. <https://doi.org/10.5539/jel.v12n2p52>
- Sridam, I., Sangkharam, P., & Ittipongse, A. (2024). The Role of Artificial Intelligence Technology in Higher Education Institutions *Journal of Education and Innovation Learning*, 4(1), 145–159. Retrieved from <https://so06.tci-thaijo.org/index.php/jeil/article/view/266447/182387>

- Srisa-Ard, B. (2013). *Basic Research*. Bangkok: Suweerivasarn Press.
- Srisunakruea, A., Khamhaenpol, A., & Pabsuppawat, A. (2023). Development of Scientific Literacy of Mathayomsuksa 3 Students on the Topic of Daily Materials Using Inquiry Model (5E) Combined with TPACK. *Journal of Humanities and Social Sciences Nakhon Phanom University*, 13(3), 295–309. Retrieved from <https://so03.tci-thaijo.org/index.php/npuj/article/view/271502/181393>
- Strobel, G., Banh, L., Moller, F., & Schoormann, T. (2024). *Exploring Generative Artificial Intelligence: A Taxonomy and Types*. Conference: Hawaii International Conference on System Sciences (HICSS) At: Honolulu, Hawaii. <https://doi.org/10.24251/HICSS.2023.546>
- Utranan, S. (1982). *Systematic Instructional Management*. Bangkok: Chulalongkorn University.
- Warabuntaweasuk, P., Thengprasert, P., Suwannarat, T., & Janepumisart, N. (2024). The Application of Generative AI in the Film Industry and Related Legal Concerns. *BU Academic Review*, 23(1), 181–200. Retrieved from <https://so01.tci-thaijo.org/index.php/buacademicreview/article/view/273103/177190>
- Yadav, A. (2024). An Analysis on the Use of Image Design with Generative AI Technologies. *International Journal of Trend in Scientific Research and Development*, 8(1), 596–599. Retrieved from <https://www.researchgate.net/publication/378291870>

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