

# Development of an Artificial Intelligence Chatbot-Integrated Learning Platform to Enhance Information, Media, and Technology Literacy Skills for 21st-Century Learners in Distance Learning System

Patthanan Bootchuy<sup>1</sup> & Phantipa Amornrit<sup>1</sup>

<sup>1</sup> Office of Educational Technology, Sukhothai Thammathirat Open University, Thailand

Correspondence: Phantipa Amornrit, Office of Educational Technology, Sukhothai Thammathirat Open University, Thailand.

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## Abstract

The objectives of this research were to: 1) develop an artificial intelligence chatbot-integrated learning platform to enhance information, media, and technology literacy skills for 21st-century learners in distance learning system, and 2) study the effects of using this platform to enhance these skills. The sample group consisted of 32 undergraduate students from Sukhothai Thammathirat Open University in Thailand, selected through voluntary sampling. The research tools included: 1) the AI chatbot-integrated learning platform designed to enhance information, media, and technology literacy skills, and 2) pre-tests and post-tests assessing these literacy skills. Data were analyzed using percentages, means, standard deviation, t-tests, and content analysis. The research findings were as follows: 1) The development of the artificial intelligence chatbot-integrated learning platform to enhance information, media, and technology literacy skills for learners in distance learning system included four key components: (1) input, with six sub-components—(1.1) learner analysis, (1.2) content analysis, (1.3) learning platform, (1.4) artificial intelligence chatbot, (1.5) personnel, and (1.6) an information, media, and technology literacy test for learners in the distance education system; (2) process; (3) output; and (4) feedback. The AI chatbot's implementation comprised three steps: (1) pre-learning, (2) self-learning, and (3) self-evaluation. The quality of the AI chatbot-integrated learning platform, as evaluated by experts, was rated at the highest level. 2) The study on the use of the AI chatbot-integrated learning platform revealed that the sample group of 32 students had significantly higher post-test scores compared to their pre-test scores, with statistical significance at the .05 level ( $t = -15.90, p = .00$ ). Based on the analysis of users' attitudes and abilities, it was found that the AI chatbot learning platform is effective as a tool for educational recommendations in distance education. The AI chatbot learning platform can also accurately analyze learners' questions and provide precise answers that meet their needs.

**Keywords:** artificial intelligence chatbot, AI chatbot, learning platform, information media and technology literacy

## 1. Introduction

### 1.1 Introduce the Problem

In the 21st century, the rapid advancement of information and communication technology (ICT) has led to unprecedented changes, integration, and connectivity across economic, cultural, social, and everyday aspects of society. Modern educational management can no longer avoid incorporating various information technologies into the diverse activities of teaching and learning. The academic discourse around the underlying digital competencies has included the ability to critically engage with the information and content found online. For example, Kim (2019) defined it as the ability to use digital technologies to collect, analyze, and evaluate information. Churchill (2020) asserts it is the ability to search for and evaluate information using digital tools. In tandem with academic debate and literature in this field, there has been a steady stream of digital literacy and digital competency frameworks that help academics and other users understand digital literacy and its component competencies (Tiernan et al., 2023). Research findings indicate that information technology in education enables instructors to organize learning activities that encourage active student participation, resulting in more effective learning outcomes.

### 1.2 Artificial Intelligence (AI) in Education

The emergence of artificial intelligence has sparked intense interest in educational research and media, particularly concerning how tools like ChatGPT might influence academic evaluation, integrity, and the broader landscape of teaching and learning. Setting aside these recent hyperbolic (Costello, 2023). discussions, it is important to consider the many practical ways AI impacts how our students and wider society access, evaluate, and consume information and media. Artificial intelligence (AI) technology is becoming a popular learning innovation, increasingly applied in education. Examples include the use of teaching robots and intelligent teaching systems. Additionally, AI applications and AI chatbots are being utilized in educational settings (Alin, 2018; Maud & Aleksandr, 2018). Studies on using AI chatbots in education for undergraduate students have found that they can enhance learning efficiency. Research by Kuhail et al. (2023) has demonstrated that using chatbots in education, particularly for undergraduate students, can significantly enhance learning efficiency. Chatbots offer several advantages, including immediate assistance, quick access to information, and improved educational experiences. For instance, a systematic review found that chatbots positively influence learning outcomes, helping students achieve better results in various academic settings by offering personalized support and facilitating self-regulated learning. Furthermore, research by Vanichvasin (2021) developed a chatbot as a digital learning tool to increase students research knowledge for undergraduate students. The research aimed to create a chatbot designed to help students improve their research knowledge. The study found that the chatbot significantly improved students' understanding of research topics, acting as a personalized learning tool that provided instant feedback and allowed students to access specific information without delay. This approach not only supported learning outcomes but also helped in making the learning experience more enjoyable and relatable for students.

### 1.3 The Information, Media, and Technology Literacy Skills in the 21st Century Competencies

The Partnership for 21st Century Skills since 2009 has identified the key components of information, media, and technology literacy skills for people in the 21st century who live in a technology and media-driven environment, marked by access to an abundance of information, rapid changes in technology tools, and the ability to collaborate and make individual contributions on an unprecedented scale (Todd, Kelley, Geoff, Jung, & Euisuk, 2019). Effective citizens and workers must be able to exhibit a range of functional and critical thinking skills, such as 1) information literacy, 2) media literacy, and 3) ICT (information, communications, and technology) literacy, which can be summarized competencies as shown in Table 1:

Table 1. The information, media, and technology literacy skills in the 21st century competencies

| Competence areas   | Competences   |
|--|---|
| 1. Information Literacy                                      | 1.1 Access information efficiently (time) and effectively (sources)<br>1.2 Evaluate information critically and competently<br>1.3 Use information accurately and creatively for the issue or problem at hand<br>1.4 Manage the flow of information from a wide variety of sources<br>1.5 Apply a fundamental understanding of the ethical/legal issues surrounding the access and use of information  |
| 2. Media Literacy  | 2.1 Understand both how and why media messages are constructed, and for what purposes<br>2.2 Examine how individuals interpret messages differently, how values and points of view are included or excluded, and how media can influence beliefs and behaviors<br>2.3 Apply a fundamental understanding of the ethical/legal issues surrounding the access and use of media<br>2.4 Understand and utilize the most appropriate media creation tools, characteristics and conventions<br>2.5 Understand and effectively utilize the most appropriate expressions and interpretations in diverse, multi-cultural environments |
| 3. ICT (Information, Communications and Technology) Literacy | 3.1 Use technology as a tool to research, organize, evaluate, and communicate information<br>3.2 Use digital technologies (computers, PDAs, media players, GPS, etc.), communication/networking tools and social networks appropriately to access, manage, integrate, evaluate, and create information to function in a knowledge economy successfully<br>3.3 Apply a fundamental understanding of the ethical/legal issues surrounding the access and use of information technologies  |

In this research, the development of an artificial intelligence chatbot integrated learning platform to enhance the information, media, and technology literacy skills in the 21st century for learners in distance learning system. The focus is on designing a learning experience that emphasizes self-directed learning, encouraging learners to continuously seek knowledge on their own through a learning platform that operates automatically based on pre-

set conditions. This learning platform allows learners to interact through text-based automatic conversations via a messaging application that is connected with Chat GPT, simulating real human interaction. An Artificial intelligence chatbot-integrated learning platform will process and promote 21st-century learning skills in information, media, and technology literacy for distance learners, equipping them with future-ready skills. Information, media, and technology literacy will enable learners to access new knowledge sources and promote lifelong learning, leading to self-development, organizational growth, and societal advancement.

The objectives of this study are to:

- 1) Develop an artificial intelligence chatbot-integrated learning platform to enhance the information, media, and technology literacy skills in the 21st century for learners in distance learning system.
- 2) Study the effects of using an artificial intelligence chatbot-integrated learning platform to enhance the information, media, and technology literacy skills in the 21st century for learners in distance learning system.

## 2. Method

This research design is experimental research, in which the researcher conducts the experiment using a one-group pretest-posttest design performed as follows:

### 2.1.1 Sample Size

The samples of this research were 32 undergraduate students from Sukhothai Thammathirat Open University, Thailand who were enrolled in the first semester of the academic year 2022. The sample was selected through voluntary sampling, where participation in the research was entirely voluntary.

### 2.2 Variables

Independent variable: artificial intelligence chatbot integrated learning platform.

Dependent variable: the information, media, and technology literacy skills in the 21st century.

### 2.3 Research Tools

The research tools of this research were divided into two types as follows:

The artificial intelligence chatbot integrated learning platform designed to enhance 21st-century learning skills in information, media, and technology literacy has four components: 1) input, which includes six sub-components: (1.1) learner analysis, (1.2) content analysis, (1.3) online learning platform, (1.4) AI chatbot system, (1.5) personnel, (1.6) information, media, and technology literacy test for learners in the distance education system; 2) process; 3) output; 4) feedback. The learning process with the AI-powered chatbot to enhance 21st-century learning skills in information, media, and technology literacy for learners in the distance education system consists of three steps: 1) pre-learning, 2) self-learning, and 3) self-evaluation, as shown in Fig. 1 Artificial intelligence chatbot integrated learning platform.

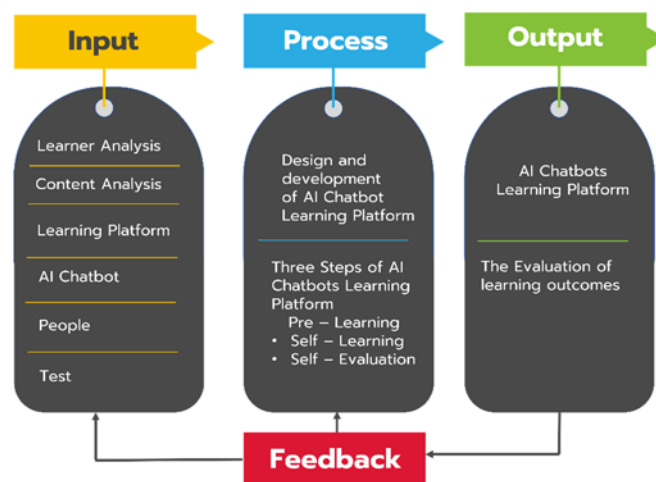


Figure 1. Artificial intelligence chatbot integrated learning platform

The design of the artificial intelligence chatbot integrated learning platform to enhance the information, media, and technology literacy skills in the 21st century for learners in distance learning system. This stage is related to the design of the artificial intelligence chatbot integrated learning platform’s workflow structure and elements, which were acquired from the analysis of the tools used in the research and the needs of the users so that the AI chatbot learning platform can fulfill their demands as best as it can. The research tools include:

1) Workflow structure of the artificial intelligence chatbot integrated learning platform

Figure 2 illustrates the workflow of the artificial intelligence chatbot integrated learning platform to enhance information, media, and technology literacy skills. Once users use the web application to ask questions in the learning platform of the distance learning system, all data will be processed in Chat GPT API using the Chatbots Engine as to the chat format created by the administrator. The Application Programming Interface (API) will process the content and respond to the users. Meanwhile, every process on this platform will be connected to a database system, so that user data can be stored in all the results.

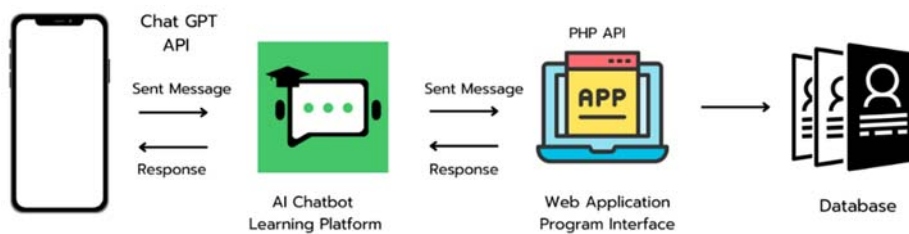


Figure 2. Workflow structure of the artificial intelligence chatbot integrated learning platform

2) Workflow diagram of the artificial intelligence chatbot integrated learning platform

The workflow diagram of the artificial intelligence chatbot integrated learning platform shown in Fig. 3 represents the system’s internal work process and the relationship between users and the subsystems there in the learning platform

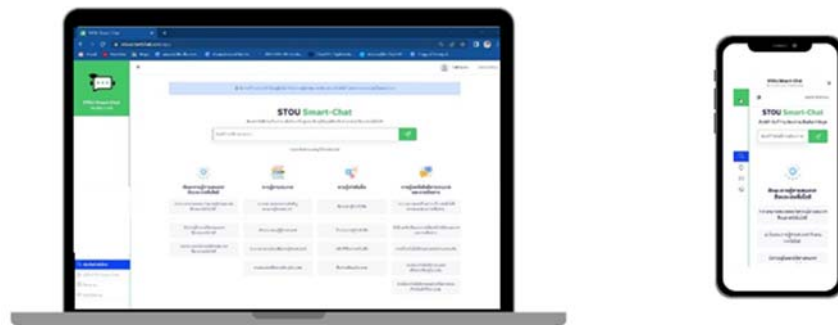


Figure 3. Workflow structure of the artificial intelligence chatbot integrated learning platform

3) User interface of the artificial intelligence chatbot integrated learning platform to enhance the information, media, and technology literacy skills in the 21st century for learners in the distance learning system shown in Figure 4.

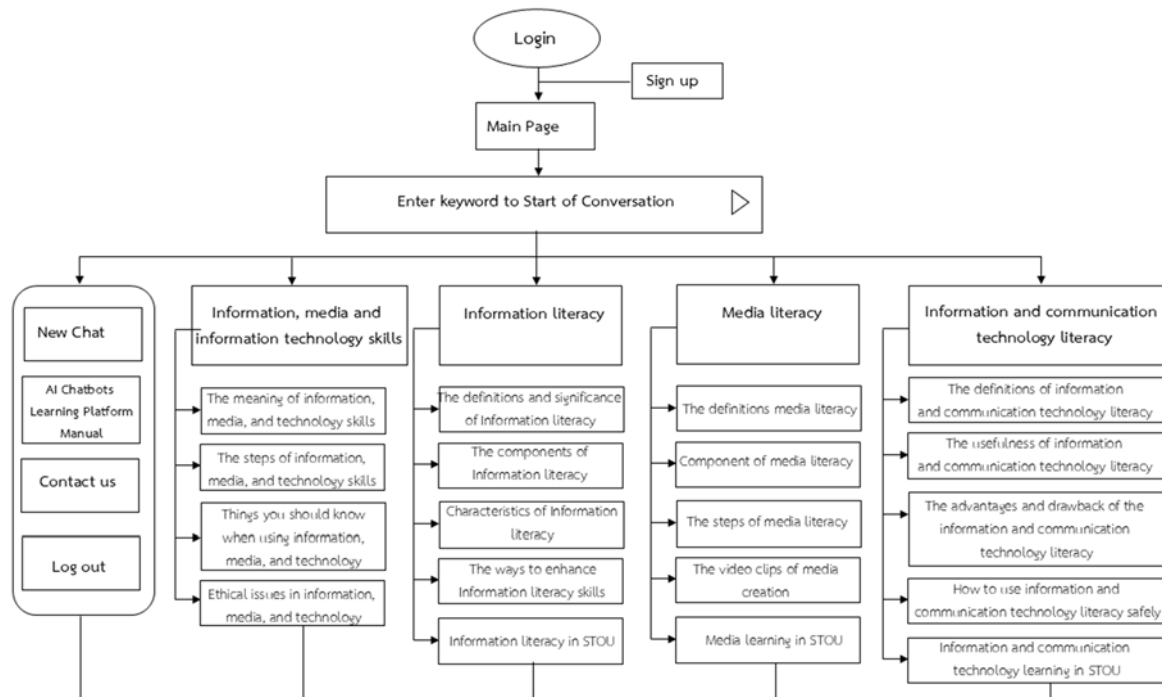


Figure 4. The user interface of the artificial intelligence chatbot integrated learning platform

The artificial intelligence chatbot integrated learning platform to enhance 21st-century learning skills in information, media, and technology literacy for learners in the distance education system was qualified by 5 experts, using a 5-point Likert scale by five experts, revealed that the experts overall found the AI chatbot to be highly appropriate for enhancing these skills, with the suitability rated at the highest level ( $\bar{x} = 4.79$ ,  $S.D = 0.15$ ).

The information, media, and technology literacy test for learners in the distance education system is a multiple-choice test with four options, consisting of 30 questions, used for both pre-test and post-test evaluations with the artificial intelligence chatbot integrated learning platform to enhance 21st-century learning skills in information, media, and technology literacy for learners in the distance education system. The test was reviewed by three experts in information technology and assessment and evaluation to check content validity and determine the Index of Item Objective Congruence (IOC). The evaluation results showed that the test had a congruence index of 0.97, which is within the range of 0.80 to 1.00, indicating that all items met the quality criteria.

#### 2.4 Data Collection

The researcher experimented according to the following steps: 1) One week before the experiment, the researcher scheduled a meeting with the sample group to ensure an understanding of how to use the AI-powered chatbot designed to enhance 21st-century learning skills in information, media, and technology literacy for learners in the distance education system. This included explaining the learners' roles in the learning system and providing a user manual for the AI chatbot system, 2) The researcher introduced the sample group to the AI chatbot, explaining how to use it to enhance 21st-century learning skills in information, media, and technology literacy. The researcher also guided how to learn, interact, and use the manual, 3) The researcher had the sample group complete the pre-test on information, media, and technology literacy for learners in the distance education system before using the AI chatbot to enhance 21st-century learning skills. The researcher recorded the pre-test scores, and 4) The researcher carried out the activity plan for using the AI chatbot to enhance 21st-century learning skills in information, media, and technology literacy in parallel with the developed AI chatbot system over four weeks. Each week included additional interactive sessions, with follow-ups scheduled every week to track the learners' progress.

#### 2.5 Data Analysis

The researcher conducted data analysis using the following:

- 1) The differences in learning outcomes between the pre-test and post-test results of the sample group of students

who used the artificial intelligence chatbot integrated learning platform to enhance 21st-century learning skills in information, media, and technology literacy for distance education were analyzed using a t-test for dependent samples.

2) The reflection of the sample group of students after the learning experience was studied through interviews, and the data was analyzed using content analysis.

### 3. Results

The results of this research, “Development of an Artificial Intelligence Chatbot Integrated Learning Platform to Enhance the Information, Media, and Technology Literacy Skills in the 21st Century for Learners in Distance Learning System” were as follows:

#### 3.1 Develop an Artificial Intelligence Chatbot-integrated Learning Platform to Enhance the Information, Media, and Technology Literacy Skills in the 21st Century for Learners in Distance Learning System

The artificial intelligence chatbot integrated learning platform to enhance the information, media, and technology literacy skills in the 21st century for learners in distance learning system comprises four main components: 1) input, which includes six sub-components: 1.1) learner analysis, 1.2) content analysis, 1.3) online learning platform, 1.4) AI chatbot system, 1.5) personnel, and 1.6) information, media, and technology literacy test for distance education learners; 2) process; 3) output; and 4) feedback. The learning process through the artificial intelligence chatbot integrated learning platform consists of three main stages: 1) pre-learning, 2) self-learning, and 3) self-evaluation. The 5 experts in educational technology and communication, information technology, and distance education systems evaluated the quality of the AI chatbot learning platform to enhance 21st-century learning skills in information, media, and technology literacy for distance education learners. The overall evaluation was at the highest level, as shown in Table 2.

Table 2. Evaluation results of the AI chatbot learning platform to enhance 21st-century learning skills in information, media, and technology literacy for distance education learners (n = 5)

| Evaluation Criteria  | Mean | Standard Deviation | Level of Appropriateness |
|--|------|--------------------|--------------------------|
| 1. The AI chatbot learning platform provides a user manual for learners to understand before use.  | 5.00 | 0.00               | Highest                  |
| 2. The knowledge content presented in the AI chatbot learning platform covers 21st-century learning skills in information, media, and technology literacy. | 4.67 | 0.57               | Highest                  |
| 3. The structure and sequence of learning in the AI chatbot learning platform are appropriate.   | 4.80 | 0.44               | Highest                  |
| 4. The AI chatbot learning platform allows learners to control the learning sequence appropriately.  | 4.67 | 0.57               | Highest                  |
| 5. The AI chatbot learning platform provides tools for giving feedback to reinforce learning appropriately.  | 4.67 | 0.57               | Highest                  |
| 6. The AI chatbot learning platform is easy to use and convenient, requiring no additional guidance.   | 5.00 | 0.00               | Highest                  |
| 7. The format of learning materials presented in the AI chatbot learning platform is diverse and engaging.   | 4.60 | 0.54               | Highest                  |
| 8. The AI-powered chatbot provides accurate results as required by users.  | 5.00 | 0                  | Highest                  |
| 9. The AI chatbot learning platform has functions that facilitate user convenience (buttons, notifications, symbols, and links)                            | 4.80 | 0.44               | Highest                  |
| 10. The AI chatbot learning platform processes quickly and covers the content intended to be presented.  | 4.67 | 0.57               | Highest                  |
| Overall Mean   | 4.79 | 0.15               | Highest                  |

From Table 2, which presents expert evaluations of the AI chatbot learning platform to enhance 21st-century learning skills in information, media, and technology literacy for distance education learners, reveals a high level of overall appropriateness. The AI chatbot learning platform received a mean score of 4.79 (SD = 0.15), indicating strong expert approval. Upon examination of individual aspects, all were consistently rated at the highest level of appropriateness. Three aspects emerged as particularly noteworthy, each achieving a perfect mean score of 5.00 (SD = 0): 1) The AI chatbot learning platform provides a user manual for learners to understand before use; 2) The AI chatbot learning platform is easy to use and convenient, requiring no additional guidance; and 3) The AI-powered chatbot provides accurate results as required by users.

### 3.2 Study the Effects of Using an Artificial Intelligence Chatbot Integrated Learning Platform to Enhance the Information, Media, and Technology Literacy Skills in the 21st Century for Learners in Distance Learning System

The results of comparing the differences in the information, media, and technology literacy skills of 32 sample group students using the AI chatbot learning platform to enhance 21st-century learning skills in information, media, and technology literacy for distance education learners, as measured by a 30-item multiple-choice test on information, media, and technology literacy before and after the learning experience, are presented. The assessment was divided into three areas: (1) information literacy, (2) media literacy, and (3) information and communication technology (ICT) literacy. The information, media, and technology literacy skills of the students are shown in Tables 3 and 4.

Table 3. Comparison of the differences in the information, media, and technology literacy skills of the sample group in pre-test and post-test (n = 32)

| Score (30)    | N  | Test | Total Score | Mean  | Standard Deviation (S.D.) | t-value | p   |
|---------------|----|------|-------------|-------|---------------------------|---------|-----|
| Pre-learning  | 32 | 30   | 30          | 20.58 | 9.18                      | 15.90   | .00 |
| Post-learning | 32 | 30   | 30          | 25.42 | 4.65                      |         |     |

Note. \* Level of significance .05.

From Table 3, it was found that the sample group of students who learned through the AI chatbot learning platform to enhance 21st-century learning skills in information, media, and technology literacy for distance education had significantly higher post-learning achievement compared to pre-learning achievement at the .05 level of statistical significance. The average score before learning was 20.58, while the average score after learning was 25.42

Table 4. Comparison of learning achievement scores of the sample group in pre-test and post-test, in three components of 21st-century learning skills in information, media, and technology literacy (n = 32)

| 21st-Century Learning Skills in Information, Media, and Technology Literacy | Score (30)    | Mean  | Standard Deviation (S.D.) | Standard Deviation (S.D.) | t-value | Significance (sig) |
|---|---------------|-------|---------------------------|---------------------------|---------|--------------------|
| Information Literacy  | Pre-learning  | 18.25 | 5.13                      | 4.28                      | 7.53    | 0.000              |
|   | Post-learning | 26.30 | 3.20                      |                           |         |                    |
| Media Literacy  | Pre-learning  | 21.50 | 6.27                      | 5.30                      | 4.98    | 0.000              |
|   | Post-learning | 28.10 | 4.10                      |                           |         |                    |
| ICT Literacy  | Pre-learning  | 23.75 | 7.45                      | 5.72                      | 2.87    | 0.000              |
|   | Post-learning | 27.85 | 3.15                      |                           |         |                    |

Note. \* Level of significance .05.

From Table 4, the analysis of the learning achievement scores of the sample group of students before and after learning, according to the three components of 21st-century learning skills in information, media, and technology literacy, revealed the following: information literacy: The average scores of pre-learning and post-learning were 18.25 and 26.30, respectively. Media Literacy: The average scores of pre-learning and post-learning were 21.50 and 28.10, respectively. ICT Literacy: The average scores of pre-learning and post-learning were 23.75 and 27.85. The findings from interviews conducted with a sample group of students regarding the AI chatbot learning platform to enhance 21st-century learning skills in information, media, and technology literacy for distance education are as follows:

“Participants reported that the AI chatbot learning platform facilitated improved comprehension of information and expanded their knowledge of the university’s information, media, and technology resources.”

“Students noted the flexibility of the AI chatbot learning platform, enabling them to engage in learning activities at any time and location.”

“The user-friendly interface and convenience of the AI chatbot learning platform were cited as factors that enhanced students’ confidence in their learning process.”

“Respondents highlighted the AI chatbot learning platform’s capacity to support autonomous learning.”

“Students appreciated the ability to access knowledge related to information, media, and technology both within the university’s scope and from external sources as needed.”

“The AI chatbot learning platform’s intuitive design, incorporating infographics, was reported to enhance

students' understanding of information, media, and technology literacy concepts.”

#### 4. Discussion and Conclusions

1) The development of an artificial intelligence chatbot integrated learning platform to enhance 21st-century learning skills in information, media, and technology literacy for distance education learners has been evaluated by experts. The overall quality assessment of the AI chatbot learning platform was rated at the highest level. When examining individual aspects, all were rated at the highest level as well. The top three equally highest-rated features of the AI chatbot learning platform were: a) The AI chatbot learning platform provides a user manual for learners to understand before use; 2) The AI chatbot learning platform is easy to use and convenient, requiring no additional guidance; and 3) The AI chatbot learning platform provides accurate results as required by users. The AI chatbot learning platform to enhance 21st-century learning skills in information, media, and technology literacy for distance education learners comprises four main components: 1) input, which includes six sub-components: 1.1) learner analysis 1.2) content analysis 1.3) online learning platform 1.4) AI chatbot system 1.5) personnel 1.6) assessment of information, media, and technology literacy for distance education learners, 2) process, 3) output, and 4) feedback. The learning process through the AI chatbot learning platform consists of three main stages: 1) Preparation (Pre-Learning), 2) Self-Learning, and 3) Self-Evaluation. This AI chatbot learning platform represents a structured approach to enhancing 21st-century skills in information, media, and technology literacy within distance education. The high ratings from expert evaluations suggest its potential effectiveness in supporting learners in these crucial areas.

This research emphasizes the design of an AI chatbot for educational purposes, implemented as an online learning platform integrated with ChatGPT, utilizing natural language processing (NLP) techniques. The system incorporates predefined conversational scenarios between learners and the AI chatbot learning platform, enabling realistic and automated interactions. The developed AI chatbot learning platform comprehensively covers content delivery to enhance information, media, and technology literacy skills for distance education learners. This content is organized into four learning modules, presented through various multimedia formats, including infographics, video clips, and automated recommendations of relevant supplementary content links. A key feature of the system is its user-driven query functionality. Learners can input prompts by “Start the conversation” to retrieve information and learn about information, media, and technology topics, both within the university's resources and from external sources. Upon the AI chatbot learning platform presenting search results, learners have the option to copy text for personal storage or share knowledge as needed. The AI chatbot learning platform's design and functionality align with the educational concept proposed by Giselly Mayra Larêdo Lima et al. (2024), emphasizing generative AI in academic settings: exploring ChatGPT among postgraduate students in adoption and implications. Research results show that students are motivated to amplify academic performance, boost productivity, and streamline time management, with ChatGPT emerging as a user-friendly solution. This research highlights the growing prevalence of ChatGPT across diverse academic activities, encompassing exploratory research, programming, presentations, and email composition. This approach to AI chatbot learning platform-assisted learning demonstrates a sophisticated integration of advanced technology with pedagogical principles, potentially offering a more flexible, interactive, and personalized learning experience for distance education students in developing crucial 21st-century skills.

2) The effects of using an artificial intelligence chatbot-integrated learning platform to enhance information, media, and technology literacy skills in the 21st century for learners in distance learning systems were analyzed using a dependent t-test. The findings revealed that the sample group of students who engaged with the AI chatbot learning platform demonstrated significantly higher post-test achievement scores in information, media, and technology literacy compared to their pre-test scores ( $p < .05$ ). These findings suggest that the AI chatbot learning platform excels in key areas of user experience and functionality, potentially contributing to its effectiveness as a tool for enhancing 21st-century learning skills in the context of distance education. This improvement can be attributed to the design of the AI chatbot learning platform, which incorporates Natural Language Processing (NLP) to enhance learning efficiency. The system promotes self-directed learning and interactive engagement through an automated AI chatbot learning platform interface. It consolidates knowledge resources on 21st-century skills in information, media, and technology literacy from both within and outside the university, accessible via a web application integrated with ChatGPT. The AI chatbot learning platform features predefined conversational scenarios that simulate realistic interactions, allowing learners to study independently through automated text-based conversations. This approach facilitates efficient learning by enabling students to rapidly access desired knowledge at any time and location. These findings align with the research of Mageira, K et al. (2022), emphasizing educational AI chatbots for content and language-integrated learning that are designed in the context of a postgraduate project using open-source and free software. Research results show that AI chatbot technology for



interactive ICT-based learning is suitable for learning foreign languages and cultural content. AI chatbots can simulate realistic conversational scenarios, helping students engage more deeply with the content. These platforms consolidate various knowledge resources and make them easily accessible, promoting continuous learning, which mirrors the system you described.

Post-learning interviews with the sample group of students revealed that the AI chatbot learning platform effectively promoted 21st-century learning skills in information, media, and technology literacy for distance education learners. Students reported improved understanding of information, media, and technology concepts, appreciated the flexibility of learning anytime and anywhere, and found the system easy and convenient to use, which boosted their learning confidence. The AI chatbot learning platform facilitated self-directed learning, allowing students to search for knowledge about information, media, and technology both within and outside the university as needed. Additionally, students noted that the AI chatbot learning platform's user-friendly interface and engaging infographic design enhanced their comprehension of information, media, and technology literacy content. These findings are also consistent with the research of Thanarat Kingchang et al. (2024), emphasizing artificial intelligence chatbot platforms for educational recommendations in higher education. Research results show that this AI chatbot platform has received a very high level of satisfaction. The AI chatbot platform is effective as a tool for providing educational recommendations in higher education. It can analyze users' questions accurately and provide answers that meet their needs. This is based on the analysis of users' aptitudes and abilities.

### **Recommendation**

- 1) To enhance interaction in the teaching process, weekly follow-ups should be implemented through AI chatbot learning platform notifications upon each login, occurring one week after each learning session. When learners complete each content module, positive reinforcement should be provided, potentially using visual representations of learning progress as a motivational tool to encourage further engagement.
- 2) In this development, learning achievement was evaluated using an information, media, and technology literacy test as a comprehensive assessment tool after completing all content modules. For future applications, it is recommended that evaluation methods be diversified. This could include content-specific tests or skill assessments through activities, practical exercises, and creative projects. Such approaches would stimulate learner interest in the content and enhance learning through engaging activities.
- 3) Providing more guidance on inputting prompts for learners using the AI chatbot via ChatGPT is advisable. The success of ChatGPT interactions largely depends on correct and clear prompt inputs. Therefore, detailed prompt instructions should be added and organized according to each content structure. For example, prompts could be provided for "Copyright and legal considerations in information technology use" and "Precautions in using information, media, and technology." Instructions could specify the desired output format, such as the number of sub-topics, and whether the information should be presented as text or in a table format. This approach would enable learners to access content more easily and efficiently, aligning with their desired outcomes based on their prompt inputs.

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### **Authors' contributions**

Asst. Dr. Patthanan Bootchuy and Asst. Dr. Phantipa Amornrit were responsible for the study design and revising. Asst. Dr. Patthanan Bootchuy was responsible for data collection and drafted the manuscript. Asst. Dr. Phantipa Amornrit revised it. All authors read and approved the final manuscript.

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### **Competing interests**

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 journal's policies adhere to the Core Practices established by the Committee on Publication Ethics (COPE).

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### **Data availability statement**

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.

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