# Integrating Creative-Based Learning into the Active Learning Process to Enhance Creative Thinking Skills in Computer Information Courses

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**ABSTRACT:** *Integrating Creative-Based Learning into the Active Learning Process to Enhance Creative Thinking Skills in Computer and Information Technology Courses refers to an instructional approach that integrates in-class learning with online learning activities. This model emphasizes active learning as the core strategy to foster student engagement and develop creative thinking skills. Furthermore, it incorporates the application of technology as an integral component, particularly in the context of public health, to ensure alignment with modern and emerging technological advancements. The objectives of this research were: (1) to design a blended Creative-Based active learning model that enhances learners' creative thinking skills in computer and information technology courses, and (2) to evaluate the effectiveness of the proposed model. The findings revealed that the design, which blends creative-based active learning management processes, was highly appropriate for enhancing creative thinking skills, with an overall high level of suitability (M = 4.56, SD = 0.44). Based on these results, it can be concluded that this instructional model is suitable for practical implementation, offering flexibility in learning, and effectively supporting continuous and lifelong learning.*

**Keywords:** Creative-Based Learning, Active Learning, Creative Thinking Skills, Computer and Information Technology

## 1. Introduction

The Program in Pharmacy Techniques Diploma (Revised Curriculum, B.E. 2565/2022) was developed to align with the National Education Act B.E. 2562 (2019), the Vocational Education Act B.E. 2551 (2008), the Ministry of Education's Announcement on Vocational Qualification Standards for the Diploma Level B.E. 2562 (2019), the National Vocational Qualifications Framework B.E. 2562 (2019), and the Ministry of Education's Regulations on Educational Management and Learning Assessment for Diploma Programs B.E. 2557 (2014). The curriculum also incorporates recent advancements in technology. One notable revision includes the restructuring of the Life Skills subject group to ensure relevance to current societal and technological contexts, and to better support student development. It comprises three major skill domains: language and communication skills, thinking and problem-solving skills, and social and life skills, which are now categorized as core competency subjects. Moreover, practical professional skills have been reinforced across all specific vocational subjects to enhance students' hands-on capabilities in the field (Office of the Vocational Education Commission, 2022).

The current education system is continuously evolving to meet the changing demands of a globalized society. As a result, educational institutions must equip learners with the necessary skills to effectively respond to the challenges of the 21st century. (Gürsoy, 2021) Therefore, modern educational management requires ongoing improvements to incorporate diverse and in-depth learning approaches that foster self-directed learning. In the field of public health, the development of these skills is of critical importance, as learners must be able to adapt to rapidly changing circumstances and create innovations that sustainably enhance the quality of life for the population (Leaudnakrob et al., 2017). This is especially true in the digital era, where knowledge of information technology and research skills are essential competencies that empower learners to explore, design, and develop health innovations effectively—thereby maximizing benefits to society.

Active Learning is a pedagogical approach that emphasizes learners' concrete engagement through hands-on practice and collaborative activities. It is rooted in Constructivist Theory which supports the construction of knowledge through experience and interaction with the environment (Tumnanchit, 2024) In this process, the instructor acts as a facilitator and motivator to promote higher-order thinking skills, including analysis, synthesis, and evaluation. (Tanpan et al., 2023). The Active Learning process consists of five key stages: (1) Stimulating Interest Stage, (2) Exploring and Searching Stage, (3) Discussing and Concluding Stage, (4) Creating Product and Understanding Stage, and (5) Reflecting on Learning Community Stage.

Creative-Based Learning is a pedagogical approach that encourages learners to develop essential skills through inquiry, analytical thinking, presentation, and collaborative creativity. (Sreejun & Chatwattana, 2023). In this learning model, the instructor assumes the role of a facilitator rather than a direct transmitter of knowledge (Chaisiri & Vanichwatanavorachai, 2022.) This approach emphasizes the importance of stimulating learners' curiosity through questioning, group-based exploration, and the exchange of ideas. The instructional process is structured into five systematic stages (1) Awareness Stage (2) Problem Posing and Interest Grouping Stage (3) Research and Creative Thinking Stage (4) Creative Presentation Stage (5) Evaluation Stage. These stages are designed to enhance creative thinking skills in a structured and progressive manner, fostering learners' abilities to generate new ideas, solve problems innovatively, and engage meaningfully in the learning process.

Creative thinking is the ability to integrate existing knowledge in such a way as to generate original ideas. It involves 'thinking outside the box', maintaining a positive outlook, and focusing on productive development (Prabandari et al., 2024). The creative thinking process begins by identifying a problem or a gap in knowledge and then employs a variety of cognitive strategies such as analysis, linking prior knowledge, and using imagination to arrive at novel and practical solution to that problem (Heldmann et al., 2024). Creative thinking skills consist of four main components: (1) fluency (2) originality (3) flexibility, and (4) elaboration.

Based on the afore-mentioned principles, theories, and rationale, the researchers developed the concept of Integrating Creative-Based Learning into the Active Learning Process to Enhance Creative Thinking Skills in Computer Information Courses. This instructional approach serves as a framework for classroom implementation, aiming to promote learners' creative thinking skills through a combination of active engagement and creative exploration. Additionally, it enhances learners' competencies in terms of using information and communication technology (ICT) with both understanding and creativity, enabling them to apply their skills meaningfully and effectively in real-world contexts.

## 2. Purpose of Research

2.1 To design a blended Creative-Based active learning model that promotes creative thinking skills on the part of students in computer and information technology courses.
2.2 To propose a blended Creative-based active learning model aimed at enhancing students' creative thinking skills in computer and information technology courses.

## 3. Literature Review

### 3.1 Active Learning

This instructional model emphasizes a variety of learning activities that promote self-directed learning, hands-on experience, and collaborative tasks. The approach fosters interaction between teachers and learners, actively engaging students in the learning process and encouraging continuous learning. It enables learners to participate in classroom

activities and draw conclusions from their own experiences. This type of instructional design is rooted in Constructivist Theory, which posits that learners construct knowledge through interaction with others and with their environment. Learning is viewed as an active process in which students build understanding based on events and experiences that occur as a result of participation and practice (Tumnanchit, 2024). In this context, learners are encouraged to link prior knowledge with new experiences, and generate new understandings through real-world applications and learning activities. Teachers act as facilitators, motivators, and guides, supporting learners in engaging in higher-order thinking processes such as analysis, synthesis, and evaluation. The learning process is systematically organized into five stages: (1) Stimulating Interest Stage, (2) Exploring and Searching Stage, (3) Discussing and Conclusion Stage, (4) Creating Product and Understanding Stage, and (5) Reflecting on Learning Community Stage. These stages are designed to help learners internalize knowledge through meaningful engagement, reflection, and collaborative interaction, ultimately leading to deeper understanding and creative application.

### 3.2 Creative-Based Learning

The Creative-Based Learning Model refers to an instructional process designed to develop essential learning skills by encouraging learners to explore and acquire knowledge through self- directed inquiry. It aims to stimulate the development of thinking skills, presentation skills, and the ability to work creatively in groups (Sreejun & Chatwattana, 2023). In this approach, learning begins by stimulating interest by the teacher posing questions or identifying topics that prompt learners to engage in research. Students are then grouped according to their interests. During the research phase, the teacher moves around the classroom to provide guidance and support to groups as needed. Creative-Based Learning, therefore, is a process that fosters skill development through inquiry based on learners' interests, with the teacher acting as a facilitator and advisor rather than acting as a traditional lecturer (Meeplat, 2020). In conventional teaching, teachers follow a fixed syllabus, progressing from the first lesson to the last in a structured and linear manner. In contrast, Creative-Based Learning shifts the teacher's role from that of a knowledge transmitter to that of a facilitator, guiding students in constructing their own understanding through active participation. This instructional model consists of five key stages: (1) Stimulating Interest, (2) Problem Posing and Interest-Based Grouping, (3) Research and Creative Thinking, (4) Creative Presentation, and (5) Evaluation. This process not only encourages learners to engage deeply with content that interests them, but also promotes critical and creative thinking, autonomy, collaboration, and innovation key competencies in the 21st-century learning paradigm.

### 3.3 Creative Thinking Skills

Creative thinking is the ability to gather existing knowledge and transform it in terms of one’s own understanding and ideas. It involves thinking outside the box, generating original thoughts, and exhibiting characteristics such as positive thinking - thinking in optimistic and constructive ways - and constructive thinking, which emphasizes beneficial and non-destructive ideas. Creative thinking also entails the ability to generate new and innovative concepts (Prabandari et al., 2024). The creative thinking process begins by recognizing problems or identifying gaps in knowledge, which can lead to the development of new or unconventional solutions. These solutions should be beneficial, appropriate, and applicable. This process involves the use of diverse cognitive strategies, including analyzing issues, connecting existing knowledge, using imagination, and exploring different perspectives to effectively address the identified problem (Heldmann et al., 2024). Creative thinking skills can be categorized into four dimensions: (1) Fluency (2) Originality (3) Flexibility and (4) Elaboration.

### 3.4 Computer and Information Technology

Computer and Information Technology involves study and practice related to the meaning, importance, and components of computers; information technology; multimedia; data communication; networking systems; electronic information retrieval; operating systems; application software relevant to professional practices; database management programs; internet-based applications; e-commerce; internet threats and security; and laws and ethics related to the use of information and communication technology. (Course Description: Computer and Information Technology, Diploma Program in Pharmacy Technique, Sirindhorn College of Public Health, Suphanburi, 2024).

## 4. Methodology

The blended creative-based active learning model is a teaching technique that emphasizes both in-class and out-of-class learning, placing learners at the center of the learning process. It integrates the concepts of Creative-Based Learning (CBL) and Active Learning (AL) to enhance creative thinking skills in computer and information technology courses. This approach enables learners to develop their creative thinking through hands-on activities, creative problem-solving, and collaborative teamwork. It encourages self-directed learning by allowing students to select topics

of interest based on their individual strengths, and to apply the acquired knowledge in real-world contexts. Learners play a central role in every stage of the learning process—from formulating questions and planning their learning, to designing and creating projects, as well as presenting and evaluating their outcomes. This learning process encourages learners to face challenges and engage in real-world experiences, promoting reflective thinking and the construction of new knowledge through the extension of prior understanding. It facilitates the effective application of knowledge across different contexts. The approach synthesizes creative-based active learning and places it in a systematic instructional process which can be categorized into five components. To ensure validity and rigor, the model was evaluated by experts with academic and professional qualifications in both public health and information technology, ensuring that the framework aligns with interdisciplinary perspectives and practical applications. The synthesis framework is illustrated as follows:

*4.1 Synthesis of Active Learning Processes*

*Table 1.* Synthesis of Active Learning Processes

| Active Learning | (Tharayil et al., 2018) | (Fatika Sari & Roulina, 2025) | (Jitjumnong et al., 2020) | (Tumnanchit, 2024) | (Drumm, 2023) | (Li et al., 2023) | (Eickholt et al., 2021) | **The chosen approach** |
|---|---|---|---|---|---|---|---|---|
| 1. Stimulating Interest Stage | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 2. Exploring and Searching Stage | - | ✓ | ✓ | ✓ | - | ✓ | ✓ | ✓ |
| 3. Discussing and Conclusion Stage | ✓ | ✓ | ✓ | - | ✓ | ✓ | ✓ | ✓ |
| 4. Creating Product and Understanding Stage | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | ✓ |
| 5. Reflecting on Learning Community Stage | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

Based on Table 1, which synthesizes the active learning process, the researcher has outlined five key steps for instructional design in this study. These are as follows:
Step 1: Stimulating Interest. The teacher poses guiding questions to assess learners' digital skills and to analyze their potential. The insights gained are used to inform and help design an appropriate instructional model.

Step 2: Exploring and searching. Students are encouraged to conduct research using credible sources in order to develop information technology-based projects that integrate with their academic discipline.

Step 3: Discussing and Conclusion Learners engage in discussions using the knowledge they have gathered from their research, and collaboratively synthesize the information to plan and develop an information technology project.

Step 4: Creating Product and Understanding. Learners apply their acquired knowledge to create a meaningful product, connecting it to their prior knowledge and integrating various data sources to support the development of their work.

Step 5: Reflecting on Learning Community. The teacher evaluates the learners' knowledge and the skills acquired through the learning process, and facilitates reflection on how this knowledge can be applied and adapted for future professional development.

*4.2 Synthesis of Constructivist Learning Processes*

*Table 2.* Synthesis of Constructivist Learning Processes

| Creative Based Learning | (Putu Verawati et al., 2022) | (Meeplat, 2020) | (Pradana, 2024) | (Chaisiri&Vanichwatanavorachai, 2022) | (Shabalina et al., 2025) | (Bukovsky, 2023) | (Lim et al., 2023) | **The chosen approach** |
|---|---|---|---|---|---|---|---|---|
| 1. Awareness Building | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 2. Problem Posing and Interest-Based Grouping | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 3. Research and Creative Thinking | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 4. Creative Presentation | ✓ | ✓ | - | ✓ | ✓ | ✓ | ✓ | ✓ |
| 5. Evaluation | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

Based on Table 2, which synthesizes the Creative- Based Learning Process, the researcher identified and summarized five key stages of instructional implementation. These are as follows:
Step 1: Awareness Building. The teacher prepares real-world problem scenarios related to the application of computer and information technology in public health. These problems are designed to stimulate learners' interest and motivation, with the scope of work tailored to the course content and aligned with learners' interests and aptitudes.

Step 2: Problem Posing and Interest-Based Grouping The teacher presents a set of problems for students to select from and in order to identify specific topics for investigation. Learners then form groups based on their interests and select appropriate digital tools to develop their projects creatively.

Step 3: Research and Creative Thinking. The teacher recommends reliable information sources to guide learners in terms of conducting research. Students collect data and apply computer and information technology knowledge to creatively develop outputs that contribute to the field of public health.

Step 4: Creative Presentation. Learners present their projects to the class, receive feedback, and revise their work in such a way as to improve its quality and relevance.

Step 5: Evaluation. The teacher evaluates the final outcomes in terms of content accuracy, creativity, and the use of information technology. Learners are also encouraged to reflect on their individual learning experiences in terms of their use of digital platforms.

4.3 Synthesis of Blended Creative-Based Active Learning Processes

*Table 3.* Synthesis of Blended Creative-Based Active Learning Processes

| Active Learning | Blended Learning Environment Management | | Creative-Based Learning | | | | |
|---|---|---|---|---|---|---|---|
| | Face to Face | Online | Awareness Building | Problem Posing and Interest-Based Grouping | Research and Creative Thinking | Creative Presentation | Evaluation |
| 1. Stimulating Interest Stage | ✓ | - | ✓ | - | - | - | - |
| 2. Exploring and Searching Stage | ✓ | ✓ | ✓ | ✓ | ✓ | - | - |
| 3. Discussing and Conclusion Stage | - | ✓ | ✓ | ✓ | ✓ | ✓ | - |
| 4. Creating Product and Understanding Stage | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - |
| 5. Reflecting on Learning Community Stage | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

Based on Table 3, which outlines the blended creative-based active learning process to enhance creative thinking skills, the researcher synthesized the instructional design into the following five stages:
Step 1: Stimulating Interest Stage. In-class learning begins by prompting students to ask creative questions related to the application of information technology in public health. The teacher prepares guiding questions to raise learners' awareness, stimulate creative thinking, and promote meaningful application. Students are encouraged to reflect their creativity through the creation of innovative work.

Step 2: Exploring and Searching Stage. Both in-class and self-directed learning activities are conducted. The teacher assigns exploratory topics that allow students to practice information searching, analysis, organization, and problem identification. Learners form groups based on shared interests and gather relevant data to support the integration of prior knowledge with new ideas for the application of information technology in public health contexts.

Step 3: Discussing and Conclusion Stage (Online Learning). Through online platforms, the teacher presents problem-based scenarios that guide learners to discuss and synthesize the information they have gathered. Students apply this knowledge to design educational media related to public health, using technology as a creative tool. These learning experiences are integrated with students' existing knowledge to generate new, innovative digital outputs.

Step 4: Creating Product and Understanding Stage. Learning continues in both classroom and online environments. Students are encouraged to identify appropriate digital tools for developing innovative products tailored to the needs of specific community groups. These creative works are expected to demonstrate a deep understanding of the topic under consideration and careful attention to detail.

Step 5: Reflecting on Learning Community Stage. In this final stage, students engage in both face-to-face and online reflection. They critically review their work through a process of evaluation, analysis, and refinement. This ensures that the developed ideas or projects are accurate, complete, and can be applied effectively in real-world settings.

Learning Environment Management refers to the blended learning approach that combines online learning and face-to-face learning to provide a flexible and effective learning experience. Blended learning emphasizes the design of teaching and learning activities by creating an environment and atmosphere conducive to learning. This includes the teaching methods used by teachers, the learning models, characteristics of the learners, teaching materials, communication channels, and the forms of interaction among learners, teachers, learners and content, as well as

learners and the learning context. The approach integrates various learning activities with a focus on flexibility to accommodate the diverse needs of learners. This aims to provide each learner with the best possible outcomes from the teaching and learning process.

*4.4 Synthesis of Creative-Based Active Learning Activity Designs*

*Table 4.* Synthesis of Creative-Based Active Learning Activity Design

| **Creative-Based Active Blended Learning Management** | **Teacher's Role** | **Learner's Role** |
|---|---|---|
| 1. Stimulating Interest Stage<br>1.1) Awareness Building | **Teacher's Role (Face to Face)**<br>The teacher introduces computer and information technology content to prepare learners for upcoming lessons and poses questions to enhance their awareness of technology use and its applications in pharmaceutical practice. | **Learner's Role (Face to Face)**<br>Learners listen to the teacher's explanation of the course, engage in critical thinking, and respond to questions in the classroom. |
| 2. Exploring and Searching Stage<br>2.1) Awareness Building<br>2.2) Problem Posing and Interest-Based Grouping.<br>2.3) Problem Posing and Interest-Based Grouping | **Teacher's Role (Online)**<br>The teacher demonstrates online searches in pharmaceutical databases and presents a video tutorial illustrating the development of educational media for disseminating medicine-related information. | **Learner's Role (Online)**<br>Learners receive instruction on searching databases and watch a video tutorial illustrating media creation for public education on medicinal treatments. |
| | **Teacher's Role (Face to Face)**<br>The teacher assigns a research topic by posing the question: *"If you were to visit a community, which information technology tool would best support communication about medicinal treatments?"* The teacher then explains the process of selecting topics for media creation and instructs learners to form eight groups of five members each. | **Learner's Role (Face to Face)**<br>Learners receive guidance on using information technology to search pharmaceutical databases and observe project examples designed to educate the public about medicinal treatments. |
| 3. Discussing and Conclusion Stage<br>3.1) Awareness Building<br>3.2) Problem Posing and Interest-Based Grouping<br>3.3) Research and Creative Thinking<br>3.4) Creative Presentation | **Teacher's Role (Online)**<br>The teacher designs problem-based tasks to promote group discussions, encouraging learners to formulate conclusions from knowledge obtained through database research. Specific research topics include:<br>1. Therapeutic uses<br>2. Types of medication<br>3. Patient groups<br>4. Medication administration<br>5. Drug usage warnings<br>Learners are required to complete worksheets in Google Classroom and propose innovative strategies for disseminating this knowledge within the community using information technology media. | **Learner's Role (Online)**<br>Learners complete a worksheet on medicinal treatments by discussing the selected medication topic. They provide information on therapeutic uses, types of medication, patient groups, medication administration, and usage warnings. In addition, they propose innovative ways to employ information technology in developing educational media for disseminating knowledge about medicinal treatments. |

| | | |
|---|---|---|
| 4. Creating Product and Understanding Stage<br>4.1) Awareness Building<br>4.2) Problem Posing and Interest-Based Grouping<br>4.3) Research and Creative Thinking<br>4.4) Creative Presentation | **Teacher's Role (Online)**<br>The teacher demonstrates the use of digital tools such as ChatGPT and Canva for creating media to support the development of educational content. | **Learner's Role (Online)**<br>Learners listen to the demonstration and practice using the tools to create informational media that will help educate the community about medicinal treatments. |
| | **Teacher's Role (Face to Face)**<br>The teacher provides guidance and consultation on how to use information technology tools to create media for disseminating knowledge about medicinal treatments in the community. | **Learner's Role (Face to Face)**<br>Learners receive feedback and advice within their groups, and then proceed with planning and creating the media content. The goal is to develop educational materials on medicinal treatments for the community. |
| 5. Reflecting on Learning Community Stage<br>5.1) Awareness Building<br>5.2) Problem Posing and Interest-Based Grouping<br>5.3) Research and Creative Thinking<br>5.4) Creative Presentation<br>5.5) Evaluation | **Teacher's Role (Online)**<br>The teacher provides guidance and demonstrates how to disseminate media online in such a way as to effectively communicate with the community, ensuring maximum impact. | **Learner's Role (Online)**<br>Learners follow the guidance and learn from the demonstration on how to disseminate media online. They prepare to share knowledge using technology and evaluate the creative thinking skills made use of in their work. |
| | **Teacher's Role (Face to Face)**<br>The teacher evaluates learners' creative work by assessing their creative thinking skills in four areas:<br>1. Fluency<br>2. Flexibility<br>3. Originality<br>4. Elaboration<br>The teacher evaluates the creative output of the learners and provides feedback for improving and enhancing the effectiveness of the work. | **Learner's Role (Face to Face)**<br>Learners undergo evaluation of their work in terms of their creative thinking skills. They receive feedback and suggestions for developing their work and improving it to make it more effective. |

*4.5 Synthesis of Creative Thinking Skills*

*Table 5.* Synthesis of Creative Thinking Skills

| Creative Thinking Skill | (Heldmann et al., 2024) | (Nilsook et al., 2014) | (Nittayathammakul et al., 2023) | (Prabandari et al., 2024) | (Torres & Blázquez, 2024) | (Rabello-Mestre et al., 2025) | **The chosen approach** |
|---|---|---|---|---|---|---|---|
| 1. Fluency | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 2. Flexibility | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 3. Originality | ✓ | ✓ | - | ✓ | - | - | ✓ |
| 4. Elaboration | ✓ | - | ✓ | ✓ | ✓ | ✓ | ✓ |

Based on Table 5., which synthesizes creative thinking skills, the researcher summarized the process and methods into four dimensions. These are as follows:

Dimension 1 Fluency. This refers to the student's ability to think quickly and efficiently, and to generate a large number of ideas within a limited timeframe. It involves the individual's ability to use language fluently, organize thoughts rapidly, and generate the desired ideas within the given time.

Dimension 2: Flexibility. This is the ability to adjust ideas, solve problems, and create a variety of alternative solutions. Students should be trained to use different tools or technologies to present creative work that is suitable for various situations.

Dimension 3: Originality. This refers to the ability to create new ideas or approaches that differ from traditional methods. This is a key factor in the development of technological work for pharmaceutical applications. Students should be trained to develop innovations or digital media that enhance the effectiveness of delivering information about medicines.

Dimension 4: Elaboration. This involves paying attention to details to ensure that the information and creative works developed are accurate and precise. In the fields of pharmaceutical work and information technology, inaccurate information can have direct negative impacts on users.

4.6 Conceptual Framework for Integrating Creative-Based Learning into the Active Learning Process to Enhance Creative Thinking Skills in Computer Information Courses

Based on the study, analysis, and synthesis of relevant literature and research on the design of blended creative-based active learning management, the aim is to enhance creative thinking skills in computer and information technology courses. This serves as a guideline for establishing a conceptual framework for research on blended creative-based active learning management to foster creative thinking skills in computer and information technology courses, as shown in Figure 5-1.

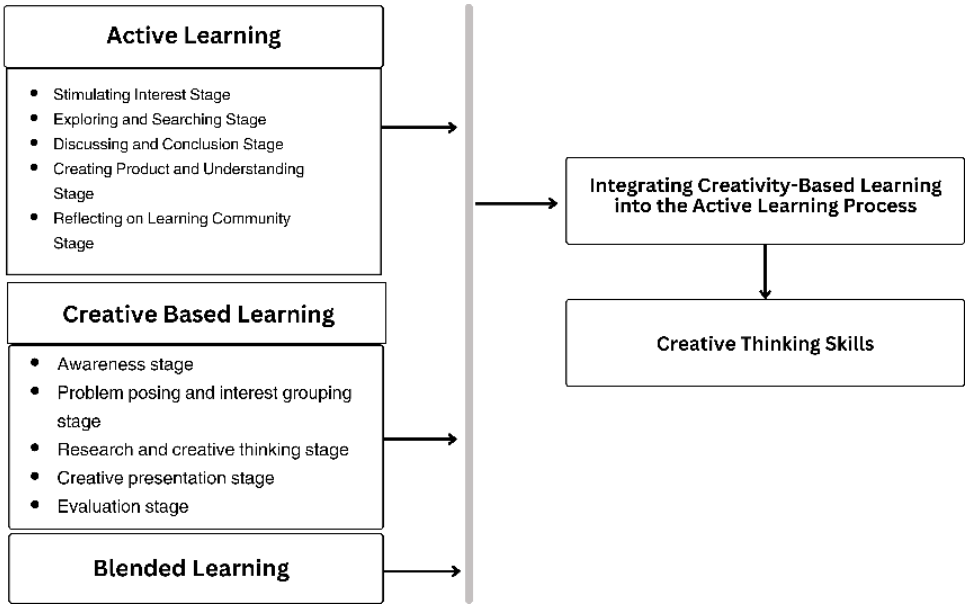


*Figure 1.* Conceptual Framework for Integrating Creative-Based Learning into the Active Learning Process to Enhance Creative Thinking Skills in Computer and Information Technology Courses

## 5. Results

### 5.1 Design of an approach with regard to integrating Creative-Based learning into the active learning process to enhance creative thinking skills in computer and information technology courses.

The synthesis of integrating Creative-Based learning into the active learning process to enhance creative thinking skills in computer and information technology courses, leads to the development of a conceptual framework for instructional design. This framework consists of inputs, processes, and outcomes, aiming to further develop integrating Creative-Based learning into the active learning process to enhance creative thinking skills in computer and information technology courses.

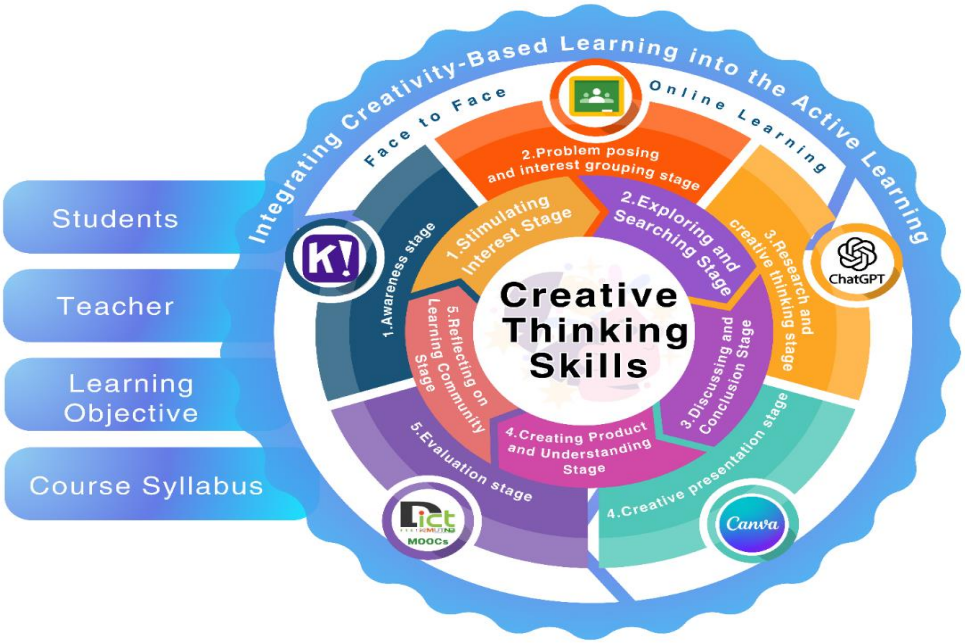


*Figure 2* Integrating Creative-Based Learning into the Active Learning Process

Figure 2 illustrates the process of Integrating Creative-Based Learning into the Active Learning Process, consisting of four main components, as detailed below:

1. Input
    - 1.1 Students
    - 1.2 Teacher
    - 1.3 Learning Objectives
    - 1.4 Course Syllabus

2. The Blended Creative-Based Active Learning Process. This process results from the integration of Creative Learning Theory and Active Learning Theory, with the following details:

2.1 Active Learning is divided into five stages as follows:

Step 1 Stimulating Interest Stage: The teacher poses questions to analyze the potential of learners and assess their digital skills, and the information gathered in this way will be used to design the learning process.

Step 2 Exploring and Searching Stage: The teacher assigns students to research credible sources and create information technology-based projects that integrate with their academic discipline.

Step 3 Discussing and Concluding Stage: Learners discuss the knowledge they have gathered from the research and draw conclusions to produce information technology outputs.

Step 4 Creating Product and Understanding Stage: Learners use the knowledge they have gathered to create a product, summarize the results, and connect it with existing knowledge, integrating new information to generate the final output.

Step 5 Reflecting on Learning Community Stage: The teacher evaluates the development of the learners' knowledge resulting from the learning process, assesses their skills and determines how they can apply this knowledge to improve future work.

2.2 Creative-Based Learning is divided into five stages as follows:

Step 1: Awareness Building. The teacher motivates students by preparing problem scenarios related to the application of computer and information technology in public health. The scope of the work is defined to align with the content and the course objectives, taking into account the learners' interests and aptitudes.

Step 2: Problem Posing and Interest-Based Grouping. The teacher defines a problem for learners to choose a topic from, and to identify the problem they want to study. Learners are also tasked with selecting appropriate digital tools to create their work.

Step 3: Research and Creative Thinking. The teacher recommends reliable information sources for learners to allow them to gather data and create innovative outputs. Students use their knowledge of computer and information technology to enhance their understanding of public health.

Step 4: Creative Presentation. Learners present their work in order to receive feedback aimed at improving its quality.

Step 5: Evaluation. The teacher evaluates the content, creativity, and use of information technology in the work. Learners are also encouraged to reflect on their learning experience in terms of their use of a digital platform.

3.Output. The output is directly produced from the blended creative-based active learning process designed to develop creative thinking skills at the Diploma Level (Vocational Certificate). Creative thinking skills are divided into four key areas as follows:

Step 1: Fluency. Learners are able to think quickly and fluently, generating a large number of ideas within a limited timeframe.

Step 2: Flexibility. Learners can shift their thinking across multiple perspectives, not sticking to rigid frameworks. They are able to approach problems from different angles and create innovative output.

Step 3: Originality. Learners can generate ideas that are new and distinct from the usual approach. These ideas are rare, not previously thought of, and are beneficial to both the individual and society.

Step 4: Elaboration. Attention to detail is crucial in the creative process, as it helps refine ideas and improve the processes, leading to effective and high-quality outcomes.

4. Feedback. The feedback involves using data collected from learners' work, suggestions, and comments from experts, as well as learning outcomes from the learning process. This feedback is then used to refine the learning process by integrating blended creative-based active learning to further develop creative thinking skills. The goal is to ensure that the learning process is maximized and beneficial to the computer and information technology courses.

**5.2 Evaluation of the appropriateness of integrating Creative-Based learning into the active learning process to enhance creative thinking skills in computer and information technology courses. This evaluation was undertaken by 5 experts.**

*Table 6* Evaluation Results of the Appropriateness in the Design and Development

| Evaluation Items | Evaluation Results | | Result |
|---|---|---|---|
| | ***Mean*** | ***SD*** | |
| **1. Input Factor** | | | |
| 1.1Students | 4.60 | 0.49 | Highest |
| 1.2 Teacher | 4.60 | 0.49 | Highest |
| 1.3 Learning Objectives | 4.80 | 0.40 | Highest |
| 1.4Course Syllabus | 4.80 | .040 | Highest |
| **2. Integrating Creative-Based Learning into the Active Learning** | | | |
| **2.1 Active Learning** | | | |
| 2.1.1 Stimulating Interest Stage | 4.80 | 0.40 | Highest |
| 2.1.2 Exploring and Searching Stage | 5.00 | 0.00 | Highest |
| 2.1.3 Discussing and Conclusion Stage | 5.00 | 0.00 | Highest |
| 2.1.4 Creating Product and Understanding Stage | 4.60 | 0.49 | Highest |
| 2.1.5 Reflecting on Learning Community Stage | 5.00 | 0.00 | Highest |
| **2.2 Creative-Based Learning** | | | |
| 2.2.1 Awareness Building | 4.60 | 0.49 | Highest |
| 2.2.2 Problem Posing and Interest-Based Grouping | 5.00 | 0.00 | Highest |
| 2.2.3 Research and Creative Thinking | 4.80 | 0.40 | Highest |
| 2.2.4 Creative Presentation | 5.00 | 0.00 | Highest |
| 2.2.5 Evaluation | 4.80 | 0.40 | Highest |
| **2.3Blended Learning** | 5.00 | 0.00 | Highest |
| **3. Output** | | | Highest |
| 3.1 Creative Thinking Skills | 4.80 | 0.40 | Highest |
| **4. Feedback** | | | Highest |
| 4. 1Result Creative Thinking Skills | 4.80 | 0.40 | Highest |
| **Overall** | **4.80** | **0.31** | Highest |

From Table 6 it can be seen that the evaluation results with regard to the appropriateness regarding the design and development of blended creative-based active learning to enhance creative thinking skills in computer and information technology courses was deemed by experts to display the highest level of appropriateness (Mean = 4.80, SD = 0.31). It can be concluded that the blended creative-based active learning process is highly suitable and fit for purpose, and can be used as a guideline for designing learning management processes to effectively enhance creative thinking skills in computer and information technology courses, stimulating learners to develop effective creative thinking skills.

**6. Discussion**

Based on the results of the design of a blended creative-based active learning approach we can divide active learning into five steps: 1) Stimulating Interest, 2) Exploring and Searching, 3) Discussing and Conclusion, 4) Creating Product and Understanding, and 5) Reflecting on Learning Community (Fatika Sari & Roulina, 2025). In addition, we can also divide Creative-Based Learning into five steps: 1) Awareness Building, 2) Problem Posing and Interest-Based Grouping, 3) Research and Creative Thinking, 4) Creative Presentation, and 5) Evaluation (Putu Verawati et al., 2022). The result is the development of a teaching and learning model that is suitable for the Diploma Program in Pharmacy

Technique. This model aims to develop knowledge of IT systems that can be applied to the field of pharmaceutical technology, as it focuses on the use of technology alongside knowledge of medicinal use to foster creative thinking skills (Nilsook et al., 2014). To ensure the effectiveness of teaching in pharmaceutical techniques and to align with current technological advancements, when combined with Creative-Based Learning, this approach helps learners develop creativity and apply their creative thinking to the production of educational content related to pharmacy. This aligns with the statements of Nilsook et al. (2014) and Prabandari et al. (2024) who mention that creative learning can stimulate learners' potential to develop new ideas and effectively apply knowledge. It enables learners to foster creativity, to analyze, to connect prior knowledge, and to use imagination to develop innovative problem-solving approaches that can be applied in real-world contexts. Integrating Creative-Based learning into the active learning process to enhance creative thinking skills in computer and information technology courses will benefit both learners and teacher in the Diploma Program in Pharmacy Technique. It is well-suited to current technological contexts, making the learning experience in pharmaceutical techniques more modern and efficient.

## 7. Conclusions

The results of this study indicate that integrating Creative-Based learning into the active learning process to enhance creative thinking skills in computer and information technology courses is suitable in all aspects. This includes the learning process that integrates active learning theory and Creative-Based learning theory. The use of technology increases flexibility in learning and effectively promotes creative thinking. The evaluation results show that this learning model enables students to create useful outputs that can be practically applied in both educational and professional settings. As a result, teaching and learning in computer and information technology courses have become more effective and up-to-date.

Nevertheless, this study has certain limitations, such as the specific context and sample group, which may restrict the generalizability of the findings. Future research should therefore examine diverse populations and educational settings, explore long-term impacts on learners' creative competencies, and investigate the integration of emerging technologies to further strengthen the applicability and scalability of Creative-Based Learning models.

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