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# AIGC-Assisted Instructional Design for the Self-Regulated Learning Course on "Implementing 2D Animation for the Ziyun Temple Stories"

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***Abstract***

*The instructional design effectively utilizes generative AI to assist in the self-regulated learning course "2D Animation Implementation of Chiayi Temple Stories". It adopts 2D animation and the PPVIO teaching model, leveraging generative AI to create 2D animation scripts and 2D animations. This enhances and sharpens students' storytelling, 2D animation production, and the ability to use generative AI. It also promotes social care, communication, collaboration, and practical application skills. Within the domain of animation graphics, tools like Midjourney and other image-generating AIs are used, with animations completed using the Cartoon Animator 5 software. In this teaching design, teachers play a guiding and mentoring role, leading students to ask more precise prompts to make good use of ChatGPT, and guiding students to overcome the setbacks of self-regulated learning. With the assistance of AI generation tools, students can not only achieve cross-disciplinary learning objectives but, more importantly, reduce the time needed to learn drawing tools. This allows students, even those not specializing in IT, to enhance their digital capabilities in a shorter period. Two suggestions are put forth. Firstly, in the creative section, although the use of AI generation tools is convenient, once technical barriers are removed, the educational content should elevate the level of students' professional creation, such as emphasizing artistic styles. Secondly, regarding self-regulated learning, self-regulated learning should not be pursued for its own sake, nor should learning be for the mere act of learning. It's crucial to stress self-monitoring, self-regulation, and self-discipline to truly grasp the essence of self-regulated learning.*

***Keywords:*** *AI Generated Content Assisted learning, Self-regulated learning, Creating 2D Animation for Taiwanese Temples*

## INTRODUCTION

In November 2022, the emergence of ChatGPT (GPT-3.5) by OpenAI in the United States marked a significant development in the field of natural language processing. Its ability to automatically and rapidly generate text captured the global users' attention within just two months, with a user base surpassing one billion individuals, breaking all previous records for online services. Subsequently, on March 14, 2023, GPT-4 was released, followed by the introduction of 'Advanced Data Analysis' in August (Piova, 2023)." According to a survey conducted by the World Economic Forum (WEF) in 2022, approximately 60% of people believe that using products and services based on Generative Artificial Intelligence (AI) will make their lives easier. Additionally, 60% of individuals anticipate that AI will profoundly impact their daily lives within the next 3-5 years, with education, safety, and employment being among the areas where the most significant changes are expected (WEF, 2022). It is evident that the generative AI wave will bring new challenges and opportunities to the field of education.

The Stanford University 2025 initiative advocates for 'Paced Education,' emphasizing that education should encourage students to self-regulate their learning pace and create meaningful and purposeful learning experiences and outcomes (Stanford University, 2015). Google and Ipsos Market Research released the 'User Search Behavior Report,' which found that in 2017, 49% of YouTube viewers in Taiwan used the platform for 'learning' (Yen, 2017). In response to the impact of the pandemic, online courses in the education sector saw a significant increase, with teachers transitioning from being mere knowledge transmitters to playing diverse advisory roles (Chen, 2021)." With the changes in higher education, the impact of digital technology, and the disruptions caused by the pandemic, university learning modes must transition from teacher-led to student-centered models, shifting from passive learning, passive thinking, and passive judgment to autonomous learning,

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independent thinking, and self-assessment.

Self-regulated learning (SRL) is a process that guides students to be 'self-aware' and fosters learning methods and attitudes characterized by 'setting personal goals, autonomous planning, self-monitoring and adjustment, and self-disciplined improvement' in order to achieve learning objectives in a cyclical manner. Both Nanhua University and Southern Taiwan University have taken into account the U.S. Department of Education's 2014 'Promoting Competency-Based Education Demonstration Program Act,' Stanford University's 2025 initiative, and the competency-based programs at the University of Southern New Hampshire in the United States to establish an educational system focused on competencies and self-regulated learning.

Furthermore, they have established self-regulated learning courses, the process from application, learning, to assessment, as illustrated in Fig. 1:

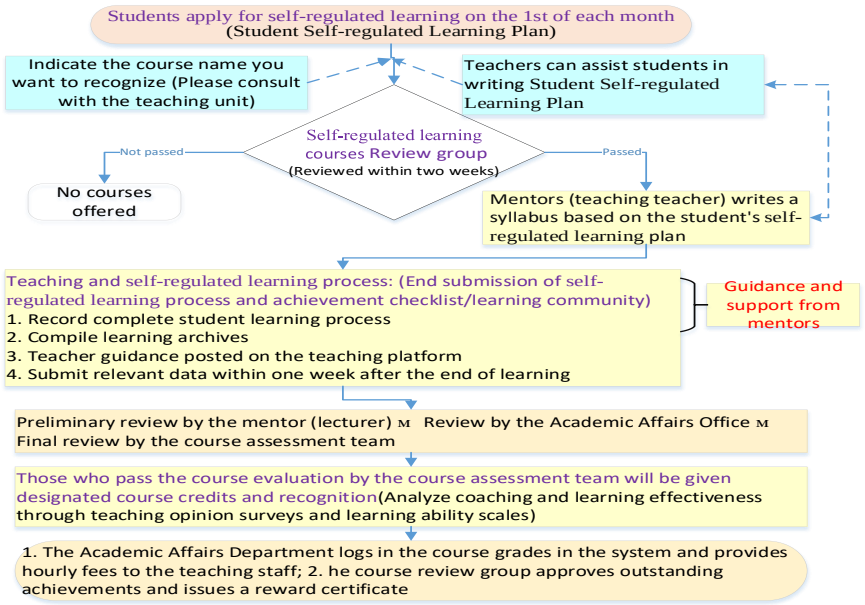



**Fig.1:** The application, learning, and assessment process of self-regulated learning

The students, based on specific learning objectives, individually or in teams, autonomously propose course plans. Upon approval and successful execution of these plans, they can receive exemptions or credit recognition. Similarly, outstanding achievements in extracurricular competitions, professional certifications, commercialization, patents, and other accomplishments obtained through self-regulated learning are subject to review and may also be recognized for credit. After implementing these initiatives, both universities have shown promising results. In an effort to continuously enhance the programs, they have proposed a 'Four-in-One Self-Regulated Learning Mechanism' involving curriculum, faculty, students, and counseling services, aiming to improve the effectiveness of student self-regulated learning (Li, 2023b). Because the focus of this study is not on self-regulated learning theory, but rather on explaining the mechanisms of self-regulated learning at our institution, and using this as the basis for the design of the '2D Animation Implementation of Ziyun Temple Stories' self-regulated learning course.

## Objectives and Goals

This study focuses on a self-regulated learning course titled '2D Animation Implementation of Ziyun Temple Stories,' with the participation of three self-regulated learning students. The course originated from the students' desire to use 2D animation to create stories about local temples in Jiayi. They aimed to address the promotional challenges faced by temples in the digital age and due to an aging population. As a result, they explored the use of animation as a means of temple promotion to capture the attention of a younger, more digitally-oriented audience.

As the instructor, the researcher collaborated with the students to plan and design the course, focusing on the issues the students aimed to address and how to enhance their skills in alignment with learning objectives. The course design involved researching the faith practices of historically significant temples in the Jiayi region, with an emphasis on understanding the unique temple beliefs and culture to enhance their social awareness. Furthermore, the selected legends from the chosen temples were used to create 2D animations as collaborative team projects, with the goal of improving digital creative skills and teamwork abilities. Through the 'learning by doing' approach, students also acquired proficiency in narrative storytelling using digital technology."

However, for students with no prior experience in animation creation, mastering the skills of writing animation scripts and creating animated visuals within a limited timeframe presents a significant challenge for the course. Nonetheless, the utilization of today's AI Generated Content and advancements in 2D animation production software (such as Cartoon Animator) have helped overcome the issues related to users' proficiency in animation software. This has also gradually become an educational trend where students are expected to possess digital competencies.

This study aims to propose, through an experimental self-regulated learning practice, how generative AI can be utilized in students' self-regulated learning and creative processes. It is hoped that this will provide insights and recommendations for education in the AI era.

## DESIGNING AI GENERATED CONTENT ASSISTED FOR INTEGRATING 2D ANIMATION INTO SELF-REGULATED LEARNING COURSES

After discussions with self-regulated learning students, the researcher found that while the students were enthusiastic about addressing issues related to the development of temple culture, they lacked expertise in the content of the course, such as knowledge about temple culture and animation creation skills and knowledge." "Therefore, the established learning objectives for the '2D Animation Implementation of Ziyun Temple Stories' self-regulated learning course are as follows. Following the course outline format provided by the school, the design is as follows (Table 1):

**Table 1: '2D Animation Implementation of Ziyun Temple Stories' Course Outline**

| | | | | | |
|---|---|---|---|---|---|
| Course Title | 2D Animation Implementation of Ziyun Temple Stories' | | | Account code | |
| C lass | ■Bachelor's class | | | Classroom | H 335 |
| Credits/Hours | 2 | total study time | 5 4 | | |
| Course Overview | This course aims to guide students in effectively utilizing the four stages of self-regulated learning, complemented by generative AI, to create 2D animations depicting the stories of Jiayi temples. Three students begin by exploring historically significant temples in the Jiayi region. They use generative AI tools such as ChatGPT to assist in their learning process, working to produce 2D animations that narrate the legends of Jiayi temples. These animations are then uploaded to YouTube for effective temple marketing targeting a younger audience. The overall team learning process encompasses setting customized objectives, autonomous planning, self-monitoring and adjustment, and self-improvement, fostering both the methods and attitudes of self-regulated learning. Through this journey, students enhance their skills in storytelling, 2D animation production, and the effective utilization of generative AI. Additionally, they develop their social awareness, communication, collaboration, and practical application ability | | | | |
| Learning objectives (Mark ability indicators) | A. To gather literature and conduct field research for writing stories about temples.<br>B. To proficiently use generative AI for crafting 2D animation scripts.<br>C. To proficiently use generative AI for producing 2D animations.<br>D. To master the four stages of self-regulated learning, enhancing teamwork, self-regulated learning, and communication skills.<br>E. To enhance social awareness and practical application abilities. | | | | |
| Textbook outline | 1. Use religious chronicles and other historical documents and academic websites to collect the history of regional temples. | | | | |
| | 2. Use field research to collect legends about temples. | | | | |
| | 3. Use ChatGPT to assist in creating 2D animation scripts. | | | | |
| | 4. Use AI such as Midjourney to generate auxiliary 2D animation creation. | | | | |
| | 5. Use discussion teaching to improve cooperation and communication skills. | | | | |
| Learning method | problem-based learning, self-regulated learning, AI Generated Content assisted learning, collaborative learning | | | | |
| Learning evaluation (please attach evaluation tools) | | allotment | Evaluation method (Achieve capability indicators) | Item allocation | |
| | | 50 | Profile evaluation | Temple history documents 10% | |
| | | | | Field investigation report 2 0% | |
| | | | | Discussion record 20% | |
| | | 5 0 | Project | Animation script 2 0% | |

| | | | | |
|---|---|---|---|---|
| | | implementation | Animation finished product 30 % | |
| Schedule (The basic number of hours to be used as a credit for 1 credit shall not be less than 27 hours) | | Learning Objectives - Name and Content | hours | Remark |
| | 1 | Collect religious chronicles and relevant literature from the Jiayi area and conduct research to create a report. | 6 | Temple Historical Evolution Literature Report |
| | 2 | Share research findings with classmates, engage in discussions on topics such as the unique religious characteristics of the Jiayi region, and create discussion records. | 6 | Discussion on the Unique Religious Characteristics of the Jiayi Region and Completion of Discussion Reports |
| | 3 | Conduct field investigations at selected temples and shrines. | 12 | Field Visits to Five Temples |
| | 4 | Compile field investigation records. | 5 | Submission of Field Investigation Reports |
| | 5 | Utilize ChatGPT to assist in crafting 2D animation scripts and complete the scripts. | 10 | Utilize Generative AI Tools to Complete 2D Animation Scripts |
| | 6 | Utilize Midjourney software to create 2D animations. | 14 | Utilize Generative AI Tools to Create 2D Animations |
| | 7 | Present the results and make revisions. | 1 | The results are uploaded to YouTube and promoted |

From the course plan, it is evident that learners initially construct knowledge about religious culture through literature collection. Subsequently, through field investigations, learners immerse themselves in the religious context, engaging in observational participation and experiencing the sacred spaces and entities. In this process, they gain an understanding of the essential meaning of sacred spaces and the concept of "*the sacred permeating the experience*" (Eliade, 1987, p. 12). Since the "existential space" represents a fundamental relationship between individuals and their environment, within this context, individuals can experience that their existence and life situations are meaningful (Norberg-Schulz, 1979). From this perception of meaning, it becomes internalized as inspiration for creative work. Furthermore, after incorporating scriptwriting theory, learners can reframe their approach by focusing on themes, ideas, characters, plot development, dialogues, and the emotions they experience. Through 2D animation, they can then present the validated religious culture and belief content that emerges from this process. Finally, the goal is to upload this animation video to YouTube for the purpose of promoting the temple.

However, due to limitations in the development of animation software and the expertise of learners, both non-specialized teachers and students may find 2D animation production to be a significant challenge. Fortunately, the emergence of ChatGPT in 2022 has had a significant impact on the future of humanity and brought about a transformation in the field of education. In addition to ChatGPT, other generative AI programs used for creative tasks, such as Midjourney, Stable Diffusion, and Office 365 Copilot, have also revolutionized the learning and application of artistic creation, including areas like images and music. Therefore, for self-regulated learners, the utilization of AI generative tools not only opens up possibilities for interdisciplinary learning but also expands the potential for learners to achieve their learning objectives.

In this course, the researcher guides students to use AI generative tools such as ChatGPT, Midjourney, Stable Diffusion, etc., as assisting tools for creating 2D animations. The teaching model applied is "PPVIO" which consists of five steps: thorough Fully Prepared, Accurate Prompt, Critique of Verification, Diversified integration, and optimize/annotate. Through these steps, students are guided in the use of AI effectively. The process involves "Preparation" through literature collection and field investigations, "Prompt" with ChatGPT assisting in script creation, "Verification" through cross-validation with literature and field interview results, and then "Integration" by incorporating feedback from the animation director and peer discussions. This iterative process occurs three times to create a 2D animation script, which is the "Optimization" phase. Additionally, in the animation graphics aspect, image generation AI tools like Midjourney are used. Finally, 2D animation is created using software such as Cartoon Animator 5. The following will elaborate on these two main parts: "ChatGPT-assisted 2D animation script creation" and "Utilizing Midjourney for image generation combined with animation creation in Cartoon Animator 5."

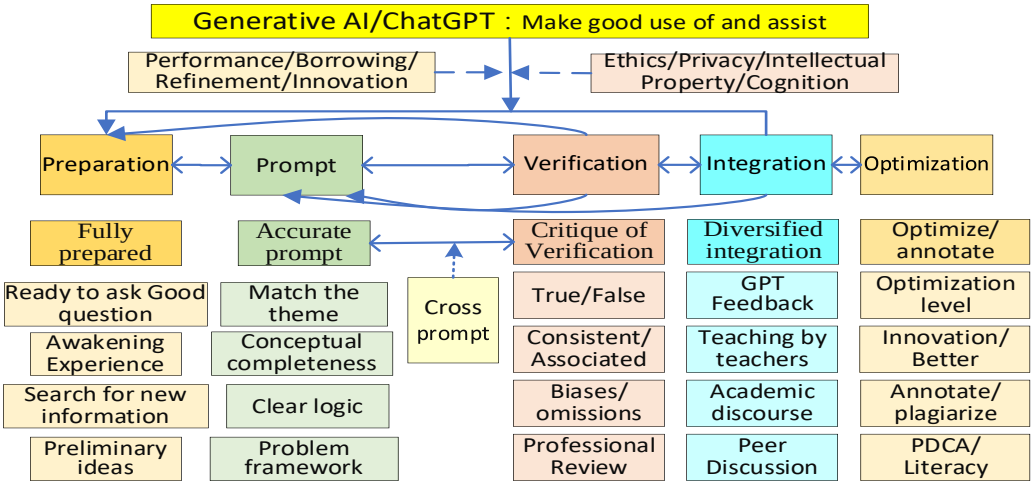
## CHATGPT-ASSISTED 2D ANIMATION SCRIPT CREATION

The emergence of ChatGPT provides an opportune moment, prompting discussions between the researcher and students on the integration of ChatGPT to assist in scriptwriting. The teaching approach follows Professor Kun Chung Li 's "PPVIO/Preparation, Prompt, Verification, Integration, Optimization" cycle model for instructional use.

## The "PPVIO Teaching Model"

When it comes to using AI tools like ChatGPT, it is advisable to approach them as aids and enhancements in the educational process, rather than viewing them as replacements. While incorporating these tools into education, two key considerations should be kept in mind, ethical and legal considerations should be at the forefront when utilizing AI tools. It is essential to use these tools in ways that respect privacy, intellectual property rights, and avoid propagating misinformation. Ensuring responsible and ethical use is crucial.

By maintaining these perspectives, educators can harness the benefits of AI tools while also upholding ethical and responsible principles in education. And Generative AI/ChatGPT：Make good use of and assist, as shown in Fig. 2.




Quoted from: Li, K. C. (2023a), "AI-assisted Instructing - The Use of ChatGPT in Teaching and Assessment" PowerPoint presentation, Tzu Chi University of Science and Technology, p. 52.

**Fig. 2:** Generative AI/ChatGPT：Make good use of and assist

The relevant explanation for the Fig. above is quoted from Lee, C. Y., & Li, K. C. (2023).

### Preparation

Refers to "fully prepared." It includes adequate preparation by both teachers and students. From the teacher's perspective, it should encompass three aspects:

[1] Clearly define learning tasks.

[2] Analyze the appropriateness of learning tasks.

[3] Explain learning tasks.

From the student's preparation perspective, there are four aspects to consider, including:

[1] Ready to ask good question: Clarify the learning task and understand the expected learning outcomes.

[2] Awakening Experience: Search for existing experiences and information related to the task.

[3] Search for new information: Search for new information or seek assistance from others when necessary to address gaps in the task.

[4] Preliminary ideas: Have preliminary insights into the task, which may be incomplete but demonstrate some initial ideas.

These aspects help students adequately prepare for the learning task.

## Prompt

Prompt refers to "asking precise questions." Asking the right questions is more important than answering questions. Additionally, the process of asking and verifying questions should be an ongoing and deepening interaction, not a one-time event. The principles of asking precise questions (prompt) include four aspects:

[1] Match the theme: Questions should be relevant to the learning task or expected outcomes.

[2] Conceptual completeness: In addition to aligning with the topic and perspective, questions should also address the six Ws (Who, Why, When, Where, What, How) and four Es (Element), including Levels (Verbs), Types (Nouns), Quantity, Form.

[3] Clear logic: The questions should have a clear context and a logical framework related to the task.

[4] Problem framework: Provide scaffolding for questioning rather than just asking students to question.

## Verification

Verification refers to "checking and critiquing." There are three dimensions to checking and critiquing, including critiquing professional knowledge, checking correctness, and avoiding bias or omission. The verification process consists of five steps. In addition to clearly displaying the question being addressed, it is necessary to clarify the question, critically analyze it, and reflect on its utility, and then examine the reasons for its lack of usefulness. The most important aspect is critical thinking, where students analyze the information provided by ChatGPT and critically evaluate its accuracy (truthfulness), consistency, relevance, comprehensiveness, and bias.

## Integration

Integration refers to "multifaceted integration." Integration dimensions include information from ChatGPT's responses, teacher instruction, academic discourse, and peer discussions. Integration strategies can be divided into three aspects:

(1) Information compilation and information fusion.

(2) Horizontal data integration and vertical process integration.

(3) Integration of professional knowledge and technical collaboration.

## Optimization

Optimization encompasses two concepts: "optimization" and "annotation." The three aspects presented include optimizing the initial GPT draft, innovating and generating insights, and annotating GPT and literature. From a cognitive perspective, there are five levels of optimization: understanding, application, analysis, evaluation, and creation. However, after understanding (knowledge), an important principle should be added: "avoidance," which means avoiding misuse, abuse, bias, etc. In this way, credibility and verifiability can be maintained during application, analysis, evaluation, and creation. Finally, it can result in generating/conceptualizing, planning/creating a plan, and producing/creating the final product.

## Application of the Double-loop PPVIO Model

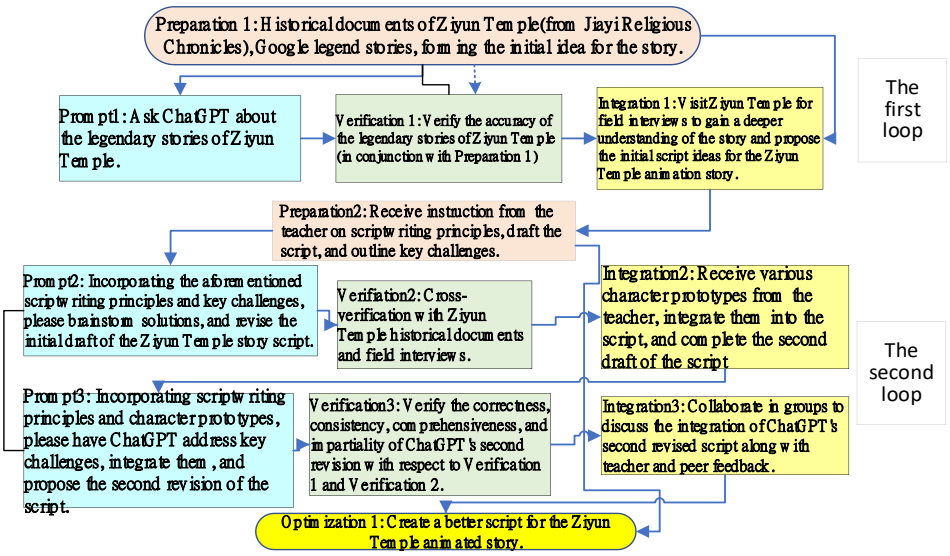



**Fig. 3:** Application of the Double-loop PPVIO Model in Compilation of the Ziyun Temple Animated Story Script

How to use the double-loop PPVIO model in teaching, its application and results are explained below using one example, " Dragon Horse and Little Black - Adaptation of the Ziyun Temple Legend in Bantianyan, Chiayi City." This is illustrated in Fig. 3.

### The First Loop

Preparation 1: Initially, instruct students to conduct literature research on the temple in their assigned area in Jiayi (using Ziyun Temple as an example). This should include references from the Jiayi County (City) Cultural Bureau, academic research papers, and also searching on Google for relevant legendary stories associated with Ziyun Temple.

Prompt 1: When asking ChatGPT about the legendary story of Ziyun Temple in Jiayi, the content of the response turned out to be entirely fabricated. The fabricated story revolves around a character named Xie San Tai Zi, who received an immortal pill from a celestial maiden but decided to bury the pill in the mountains, choosing not to ascend to immortality.

Verification 1: To validate the accuracy of the content provided in Prompt 1, we cross-referenced it with the literature gathered through Preparation 1. It became evident from this example that when using ChatGPT, particularly concerning historical accuracy and reliance on documented sources, users should exercise caution regarding the potential for inaccurate or fictional content.

Integration 1: To further consolidate and analyze relevant information for the Ziyun Temple story script, students recognized the need for on-site field research and interviews with individuals. This approach allowed them to experience the atmosphere of the temple, immerse themselves in the cultural and historical significance of religious artifacts, architecture, and other aspects. Students filled out the "Off-campus Field Research Group Report Record," and their feedback indicates that this aspect of learning was crucial in understanding religious culture and forming the initial script concept.

### The Second Loop

Preparation 2: Once students had a clear idea about the Ziyun Temple legend, it wasn't sufficient for creating a script because scriptwriting requires a theoretical foundation. The goal wasn't to make a documentary but to adapt the legend into an engaging animated script. Therefore, students were further instructed by a scriptwriting

expert in the principles of scriptwriting, providing them with the necessary skills to create a script. Based on these initial principles, students drafted a script concept as outlined in Table 2:

**Table 2: Initial Draft of the Animation Script for Ziyun Temple, Bantianyan, Chiayi County**

| Act 1: Setting | Act 2: Conflict | Act 3: Resolution |
|---|---|---|
| Characters: Rich Merchant, Fu Zi Xian (符仔仙), Sorcerer, Oracle Child (乩童), Old Mazu Three (老三媽)<br>Desires: Wealth, Power<br>Location: Ziyun Temple on Bantianyan (半天岩紫雲寺), Zhen Wu Temple on Zhuqi (竹崎真武廟)<br>Time Period: During the Japanese colonial era<br>Story Duration: One week | Conflict 1: The rich merchant wants to disrupt Feng Shui to amass great wealth. He teams up with the sorcerer and Fu Zi Xian to confront Old Mazu Three.<br>Conflict 2: The sorcerer sends a Black Dog Monster to create chaos. | Resolution 1: Old Mazu Three descends and warns Fu Zi Xian that she won't leave until the Feng Shui issue is resolved.<br>Resolution 2: Old Mazu Three chases and seals the Black Dog Monster, bringing it under her control. |

Prompt 2: After incorporating screenwriting principles, the students further utilized ChatGPT to brainstorm solutions. Based on their field research findings that Ziyun Temple housed an Ascending Dragon Guanyin Bodhisattva, they developed a specific story framework titled "Dragon Horse and Little Black".

The content is the background information provided by the students for this story, including details about the time period, characters, events, etc. But there are still some key issues unresolved, so we used ChatGPT to assist in solving them, as shown in Fig. 4 below:

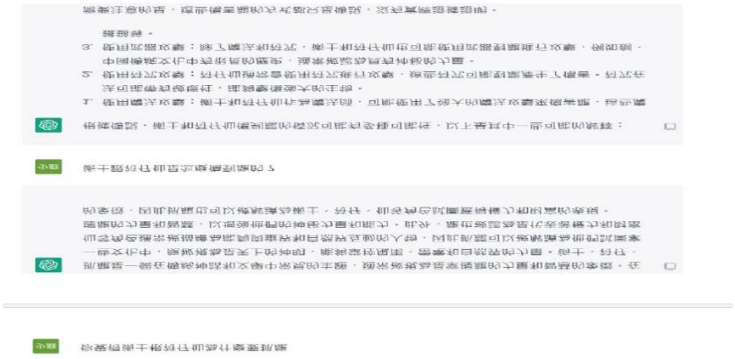


**Fig. 4:** Prompt 2 Screenshot 2

From ChatGPT's responses, you can see that by using prompting techniques, more detailed plot elements are continuously added.

Verification 2: The generated script is based on the existing story of Ziyun Temple, so it cannot deviate too much. It must undergo mutual verification with the previous literature collection, fieldwork, and interviews.

Integration 2: In addition to the requirements mentioned in Verification 2, the importance lies in the portrayal and description of characters in the script, which may differ from historical records. Therefore, the scriptwriting experts further guided the students in conceptualizing character prototypes. After integration, two revised drafts were generated through Prompt 3 (as shown in Fig. 5 and 6).


**Fig. 5:** Prompt 3 Screenshot 1

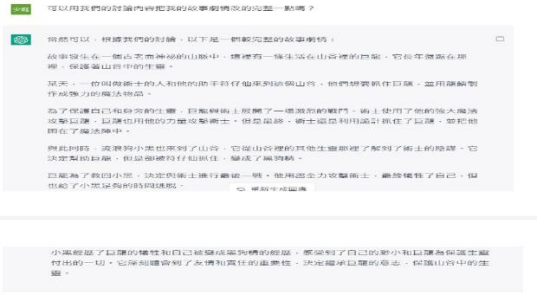


**Fig. 6:** Prompt 3, screenshot 2

After completing Prompt 3 based on the characters, students used ChatGPT to organize the following revised scripts, as shown in Fig. 6. From this, you can see that ChatGPT has provided a structured description of the overall plot.

Integration 3: Finally, after peer discussions and guidance from teachers, a revised script is proposed through collective integration.

Optimization 1: Finally, a refined script that incorporates the principles of scriptwriting is created. As follows:

### *Act 1: Guardians of Ziyun Temple*

*Time: Daytime*

*Location: Ziyun Temple*

*Characters: Villagers, Dragon Horse, Old Mazu Three*

*Content: Old Mazu Three and Dragon Horse descend from the heavens to guard Ziyun Temple and protect the people.*

*Narrator: Old Mazu Three and Dragon Horse descend from the heavens to guard Ziyun Temple.*

*(Old Mazu Three and Dragon Horse patrol in Longmen Village)*

*Villager: Thank you both for protecting our village. Please enjoy these homemade pancakes as a token of our gratitude.*

### *Act 2: Unexpected Friendship*

*Time: Daytime*

*Location: Forest*

*Characters: Dragon Horse, Little Black Dog*

*Content: Dragon Horse befriends Little Black while sneaking out of the temple. They bond over pancakes.*

*Dragon Horse: Bored and looking for a friend.(Noticing Little Black, a lonely dog)*

*Dragon Horse: Hey, want to play and share my pancakes? I'm Dragon Horse.*

*Little Black Dog: Sure, I'm Little Black. Let's play!*

### *Act 3: Hidden Threat*

*Time: Daytime*

*Location: Forest*

*Characters: Sorcerer, Little Black Dog*

*Content: A sorcerer plans to steal Dragon Horse's scales, capturing Little Black as part of his scheme.*

*Sorcerer: These scales will make me rich.(Spots Little Black)*

*Sorcerer: I'll create chaos, drain Dragon's energy, and make a fortune!*

***Act 4: Dragon Horse's Dilemma***

*Time: Day*

*Location: Dragon Gate Village*

*Characters: Dragon Horse, Black Dog Monster, Sorcerer, Old Mazu Three*

*Content: The sorcerer transforms Little Black into a monster. Dragon Horse faces a dilemma between protecting his friend and the people.*

*Old Mazu Three: Handle the Black Dog Monster in Longmen Village.*

*Dragon Horse: Little Black, it's you!*

*Sorcerer: I'll take your scales!*

*Dragon Horse: Protecting people is my duty!*

*(Dragon Horse frees Little Black from the monster's grip and sacrifices himself to save the village)*

***Act 5: Guardian of Faith***

*Time: Day*

*Location: Longmen Village*

*Characters: Old Mazu Three, Little Black Dog, Villagers*

*Content: Little Black takes on Dragon Horse's role as the guardian, comforting by Old Mazu Three.*

*Narrator: Dragon Horse disappears, leaving Little Black melancholic.*

*Little Black: Where did Dragon Horse go?*

*Old Mazu Three: His spirit remains. You'll continue guarding alongside me.*

*(Little Black assumes Dragon Horse's role, patrolling Longmen Village with Old Mazu Three.)*

From the completed script by the students, it's evident that ChatGPT can assist students in organizing their initially scattered ideas and rationalizing the plot. The role of the instructor is also crucial, as they need to provide students with professional screenwriting principles and related knowledge, enabling students to utilize AI tools to create a comprehensive and coherent script that adheres to these principles.

## UTILIZING MIDJOURNEY FOR IMAGE GENERATION COMBINED WITH ANIMATION CREATION IN CARTOON ANIMATOR 5.

After the script creation, 2D images for the animation were also developed by students under the guidance of animation experts using Midjourney. Midjourney is an AI drawing generation tool developed by the independent research laboratory Midjourney, Inc. (https://docs.midjourney.com/).

However, generating prompts requires using English, and it may involve specialized English terms for themes, styles, and more. Therefore, during the teaching process, the PromptHero website (Fig. 7) can be utilized. This website allows users to search for the desired style images, and it provides English prompts (Fig. 8) alongside them, which students can emulate and modify according to their requirements."

Based on the scene design in the script, apart from the animation homepage, Fig. 9 is generated by Midjourney as the image of Ziyun Temple, Fig. 10 features the Black Dog Monster also generated by Midjourney, while Dragon Horse (Fig. 11), villagers, and the statue of Old Mazu Three (Fig. 12) were created by students through computer graphics.

However, overall, due to the incorporation of too many different graphic styles, it lacks cohesion, and it's difficult to discern the time period or region of the story from the visuals. This is a challenge when using AI for generating graphics.

Finally, the 2D animation video is uploaded to YouTube (Fig. 13) with the hope of promoting Ziyun Temple to young people. Additionally, the entire process of self-regulated learning is edited into a video and uploaded to YouTube (Fig. 14) for presentation.

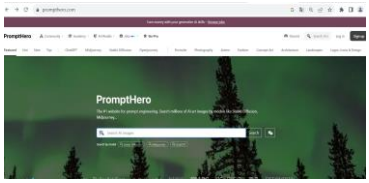



Fig. 7


Fig. 8

Fig. 9

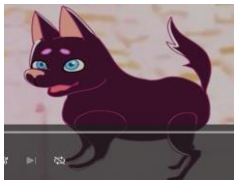


Fig. 10

Fig. 11

Fig. 12


Fig. 13


Fig. 14

## CONCLUSION AND SUGGESTIONS

This self-regulated learning course aimed to integrate self-regulated learning with AI-assisted tools for learning and creative purposes, with the goal of promoting culture of temples, education, and innovation. Through students' participation, we successfully adapted the traditional story of Ziyun Temple into a 2D animation and promoted it to young audiences through platforms such as YouTube. We have generalized the following conclusions and recommendations:

[1] Integration of AI Technology and self-regulated learning: AI technologies like ChatGPT and Midjourney can assist students in problem-solving, organizing their thoughts, and generating visual elements during the process of self-regulated learning. However, it is crucial for instructors to provide professional knowledge and guidance to ensure the consistency and quality of both the script and imagery.

[2] Consistency in Visual Style: Careful consideration should be given to the selection of visual styles during the creative process to ensure the overall consistency and cohesiveness of the animation. The fusion of too many different styles may impact the presentation of the story, highlighting the need for

more control and selective choices.

In addition, there are two key suggestions arising from this research. Firstly, in the creative section, although the use of AI generation tools is convenient, once technical barriers are removed, the educational content should elevate the level of students' professional creation, such as emphasizing artistic styles. Secondly, regarding self-regulated learning, self-regulated learning should not be pursued for its own sake, nor should learning be for the mere act of learning. It's crucial to stress self-monitoring, self-regulation, and self-discipline to truly grasp the essence of self-regulated learning.

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