

# The Investigating of Self-Regulatory Method to Enhance Students' Autonomous Learning Ability for Freshmen at Yunnan Normal University

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## Abstract

This study focused on freshmen at Yunnan Normal University. The research objectives were threefold: (1) to investigate the role of self-regulatory methods in enhancing students' autonomous learning ability, (2) to study the differences between the control group and the experimental group, and (3) to determine if students are satisfied with self-regulatory methods for enhancing autonomous learning ability. The research sample included 9,000 new students in the 2023 academic year. There were 48 classrooms, each consisting of 180-187 students. Students from two randomly selected classrooms were studied. The study employed stratified random quantitative analysis. Statistical analysis used mean average value ( $\bar{X}$ ), standard deviation (S.D.), and variance to interpret the data. The main research tools were questionnaires, lesson plans, and a satisfaction questionnaire. The results showed: (1) The overall mean score was 4.11 with a standard deviation of 0.4, indicating a generally high recognition of autonomous learning methods among the students in the experimental group, reaching the "agree" level; (2) for the experimental group  $\bar{X}$  was 94.57, while the control group had an  $\bar{X}$  of 75.15. The experimental group exhibited less variability in scores, with an S.D. of 2.82 compared to 9.49 for the control group, indicating more consistent and concentrated performance among the experimental group students.

Additionally, the variance for the experimental group was 7.98, whereas the variance for the control group was 90.13, demonstrating the stability and reliability of the experimental group's performance. (3) By comparing the results of the experimental and control groups, it is evident that self-regulatory methods significantly enhance students' satisfaction with their autonomous learning experiences. The experimental group had higher satisfaction levels, with an  $\bar{X}$  of 4.71, very satisfied, and an S.D. of 0.23, compared to the control group, which had an  $\bar{X}$  of 2.72, dissatisfied, and an S.D. of 0.71. This study's results indicate that self-regulatory methods significantly enhance students' autonomous learning ability, with noticeable differences between the experimental and control groups, and that students are satisfied with these methods. Future research could further explore the application of self-regulatory methods across different educational stages and subjects.

**Keywords:** self-regulatory, autonomous learning, student satisfaction

## 1. Introduction

At Yunnan Normal University, the self-regulatory reading ability of freshmen has received widespread attention. Take "Alice in Wonderland" as an example. As one of the classic literary works, it has literary value, contains profound philosophy, and has a positive role in promoting new students' reading ability and thinking development. However, in the process of cultivating self-regulatory reading among freshmen, we face a series of problems.

**Reading motivation:** Freshmen are not motivated enough to read classic literary works. They may be more inclined to read quickly and happily or be affected by course pressure and lack initiative and interest in reading.

**Reading comprehension:** Since the language and plot of literary works may differ from their past reading experiences, new students may face comprehension barriers and be unable to grasp the connotation and significance of the works deeply.

**Initiative and critical thinking:** Freshmen lack sufficient initiative and critical thinking in reading and cannot conduct in-depth analysis and thinking. They only read in general instead of thinking deeply.

Reading ability improvement path: Freshman students usually lack guidance and planning for Self-regulatory reading. It is necessary to establish a systematic path for improving reading ability to guide freshmen in gradually improving their reading levels.

Therefore, in response to the above problems, we need to take a series of measures to enhance the Self-regulatory reading ability of freshmen. At Yunnan Normal University, how to cultivate the Self-regulatory reading ability of freshman students through the Self-Regulatory Method is an important issue. Taking “Alice in Wonderland” as an example, we can use the following steps to guide freshmen to read Self-regulatory:

Step 1: Prepare before reading: Before starting to read, guide the new students in understanding the author, background, and topic to stimulate their interest.

Step 2: Set reading Goals: Help new students clarify the purpose and expected gains of reading, such as understanding the plot of the story, analyzing the character, etc.

Step 3: Read in sections: It is recommended that freshmen read in sections or paragraphs to help them concentrate and understand the content.

Step 4: Actively participate: Encourage freshmen to ask questions, take notes, and record their thoughts during the reading process to enhance their sense of participation and depth of thinking.

Step 5: Use reading strategies: Guide new students to use different reading strategies, such as prediction, inference, comparison, etc., to improve reading efficiency and comprehension.

Step 6: Discuss and share: Organize reading groups or classroom discussions to allow freshmen to share their reading experience and understanding to enhance communication and learning.

Step 7: Guide deep thinking: By raising challenging questions or guided discussions, we guide freshmen to think deeply about the meaning and value behind their works and cultivate critical thinking and creative thinking.

Through the above steps of the Self-Regulatory Method, freshmen can gradually develop their self-regulatory reading ability, improve their reading comprehension level, and enjoy the fun and gains of reading.

Students’ autonomous learning ability is one of the most critical abilities for college students in the learning process, and teachers play a vital role in cultivating students’ autonomous learning ability. Therefore, it is necessary to study how teachers can enhance college students’ autonomous learning abilities through Self-regulatory methods. This study will explore Self-regulation methods, such as Self-Evaluation, Goal Setting, Strategic Planning, Strategy implementation and Refinement, Strategic Monitoring in improving students’ ability to learn self-regulation. Through this research, teachers can be provided with practical strategies to help them better guide students and enhance their autonomous learning abilities, thereby improving their academic achievement and self-development capabilities.

According to Yunnan Normal University school statistics, the reasons why students cannot learn self-regulation include a lack of goals and motivation, unclear why they want to learn a specific content, or lack of sufficient motivation to learn, so they may lack self-discipline to learn. Lack of time management skills and the inability to effectively manage time may lead to the failure of study plans. Failure to allocate time to study reasonably makes it challenging to maintain self-discipline. Inattention and lack of concentration may lead to inefficiency in learning and an inability to focus on learning tasks. Lacking self-control, some people may be susceptible to temptations and unable to control their impulses, such as excessive use of social media, playing games, or other recreational activities, and cannot concentrate on their studies—lack of effective learning strategies. If people do not master a learning strategy that suits them, they may feel frustrated and lose interest and motivation. Lack of self-confidence may lead to doubts about one’s abilities, thus affecting self-discipline in learning. Environmental factors, such as the quality of the learning environment, family support, and social pressure, may also affect whether a person can maintain self-discipline in learning.

### *1.1 Research Questions*

- 1) How do self-regulatory methods enhance students’ autonomous learning ability?
- 2) What is the difference between the control and experimental groups?
- 3) How are the students satisfied with the self-regulatory methods and students’ autonomous learning ability?

### *1.2 Research Objectives*

- 1) To investigate self-regulatory methods to enhance students’ autonomous learning ability.
- 2) To study the difference between the control group and the experimental group.

- 3) To study whether the students are satisfied with self-regulatory methods to enhance their autonomous learning ability.

## 2. Literature Review

### 2.1 Step of Self-Regulatory Method

The steps of self-regulatory methods for college students include consciousness and identification, analysis and understanding, formulating response strategies, implementation and action, and feedback and adjustment. Through this series of steps, college students can more effectively cope with stress and challenges and maintain mental health and academic success. Future research can further explore the effects and mechanisms of different self-regulating methods steps and provide a more in-depth theoretical foundation and practical guidance for college students' psychological health.

#### (1) Consciousness and recognition phase

Before facing stress and challenges, college students must know their emotions and situations and identify the pressure source. This step involves individuals' emotional perception and self-awareness, helping college students understand their problems and challenges (Brackett & Rivers, 2014).

#### (2) Analysis and understanding stage

Once the pressure source is recognized, college students need to analyze further and understand the nature and influence of the problem. This step involves in-depth thinking and analysis of the problem, helping college students to understand the reasons and possible solutions for the issue and to provide the foundation for subsequent regulatory strategies (Compas et al., 2017).

#### (3) Formulate the stage of response strategy

Based on understanding the problem, college students need to formulate specific response strategies. These strategies can include various aspects such as emotional regulation, behaviour regulation, and cognitive adjustment. College students can choose the appropriate adjustment method according to their situation and needs and formulate specific implementation plans (Garnefski & Kraaij, 2006).

#### (4) Implementation and action stage

After formulating the strategy, college students must practice it and actively take action. This step involves the ability and action of individuals. College students must overcome inertia and delay, actively respond to problems, and formulate a good adjustment strategy (Zimmerman, 2000).

#### (5) Feedback and adjustment phase

During the implementation process, college students must continue reflecting and adjusting. According to the actual effects and feedback, college students can adapt their adjustment strategies to improve further and optimize. This step helps college students to continuously learn and grow and improve the efficiency and adaptability of self-regulation (Aldao et al., 2010).

### 2.2 The Step of Autonomous Learning

College students' autonomous learning means that during the learning process, they actively choose learning content, learning methods, and learning time according to their needs and effectively achieve their learning goals through self-management and self-evaluation. Autonomous learning is not only a way of learning but also a reflection of attitude and learning ability. This section will analyze and discuss the steps of autonomous learning.

#### (1) Set learning goals

The first step of autonomous learning is to set clear learning goals. Students need to clarify the learning results and goals they want to achieve and the time and energy required. This helps students clarify their learning directions and improve learning efficiency (Pintrich, 2000).

#### (2) Planning and learning process

After setting the learning goals, students need to make detailed learning plans. Students can formulate daily, weekly, or monthly learning plans according to their learning goals and time arrangements and clarify learning tasks and learning steps. This helps students arrange learning time reasonably and improves learning efficiency (Zimmerman, 2008).

#### (3) Choose learning resources

After planning the learning process, students need to choose the right learning resources. Students can select

learning materials, tools, and platforms suitable for their learning needs and preferences, such as textbooks, courseware, network resources, etc. This helps students gain knowledge and information more efficiently (Chiu & Churchill, 2016).

#### (4) Implementation learning plan

After choosing a good learning resource, students must actively implement learning activities following the learning plan. Students can adopt different learning methods, such as reading, listening, discussion, practice, etc., to improve learning effects. During the learning process, students must maintain concentration and patience, overcome learning difficulties, and maintain learning motivation (Zimmerman & Schunk, 2011).

#### (5) Self-evaluation and reflection

After the learning activities, students must self-evaluate and reflect on their learning processes and results. Students can review the gains and deficiencies in the learning process, analyze the effectiveness of learning effects and learning methods, adjust their learning strategies and plans, and improve learning effects and quality (Panadero, 2017).

#### (6) Continuous improvement and feedback

Finally, students need to continue improving learning methods and plans based on the results of self-evaluation and reflection. Students can seek the opinions and suggestions of others, accept feedback and guidance from others, and continuously improve their learning ability and learning level. This helps students continue to enhance their lifelong learning ability (Deci & Ryan, 2012).

### *2.3 The Relationship Between Autonomous Learning and Self-Regulatory*

#### (1) Autonomous learning is the prerequisite and foundation of self-regulatory

Autonomous learning is the prerequisite and foundation of self-regulation. Only after the students have a specific autonomous learning ability and self-management ability can they effectively regulate themselves, better control their emotions, behaviours, and cognitive processes, and adapt to different learning and living environments (Zimmerman, 2000).

#### (2) Autonomous learning to enhance the development of self-regulatory

Autonomous learning helps to enhance the development of students' self-regulation. In the process of autonomous learning, students need to choose the appropriate learning method and learning strategy according to their learning goals and needs, autonomous management of learning time and learning tasks, which helps to cultivate students' Self-regulatory ability and self-control ability (Panadero, 2017).

#### (3) Self-regulatory and improve the effect of autonomous learning

Self-regulatory helps enhance the impact of autonomous learning. By self-regulation, students can better control their emotions and attention, handle learning tasks and solve learning problems more effectively, improve the efficiency and quality of learning, and achieve the ultimate goal of autonomous learning (Garnefski & Kraaij, 2006).

#### (4) Autonomous learning and self-regulating interaction

Autonomous learning and self-regulation are interactive. Autonomous learning requires students to have specific Self-regulatory abilities, and self-regulation can improve learning by promoting autonomous learning. The interaction between the two can help form a benign learning cycle and enhance the comprehensive development of students (Deci & Ryan, 2012).

## **3. Method**

### *3.1 Research Population and Samples*

#### *3.1.1 Population*

The research population of this study aims to delve into the problem of improving the autonomous learning ability of freshmen. The study population covered the freshmen of Yunnan Normal University in 2023. According to the data provided on the official website of Yunnan Normal University, there will be about 9,000 new students in the 2023 academic year. There were 48 classrooms, and one classroom consisted of 180-187 students. In total, 9000 students are the population.

The age range for freshmen at Yunnan Normal University in 2023 is 17 to 24, but the primary age is 18 to 19. Most of the students are from the Yunnan region. Through in-depth research into this population, we aim to gain broader, comprehensive insights to support answers to research questions.

### 3.1.2 Samples

The simple random sampling was used in this study. The researcher draws the number of the classrooms as Custer random to select the experimental and control groups. The research subjects of this article are from 48 classrooms of freshmen at Yunnan Normal University. 184 students were divided into control groups from classroom no. 34 and 184 students from classroom no. 12 were an experimental group.

### 3.1.3 Sampling Methods

At the beginning of the semester, there are 9,000 first-year students at Yunnan Normal University. According to the questionnaire, students must complete the test to ensure its accuracy and validity. The research subjects of this article are from 48 classrooms of freshmen at Yunnan Normal University. 184 students were divided into control groups from classroom no. 34 and 184 students from classroom no. 12 were an experimental group. In the research design, students received a questionnaire to select their autonomous learning status before the autonomous learning ability training. Divide students into two groups in appropriate proportions. At the end of the semester, the behavioural activities and questionnaire results of 368 students on their Self-regulatory reading abilities were recorded. Compare the Self-regulatory reading ability behavioural activities and questionnaire results of the experimental and control groups. The t-test data were analyzed and accepted. By comparing the semester's Self-regulatory reading ability behavioural activities and questionnaire results, we test whether the self-regulatory methods of the experimental group can significantly improve students' autonomous learning ability.

At the beginning and end of the semester, the number of times students went to the library and study room was counted and compared with the experimental and control groups' data. Infer whether the students' enthusiasm for autonomous learning has been improved.

## 3.2 Research Instrument

Part 1. To answer research question 1

### Questionnaires

The questionnaires are designed to assess various skills and capabilities among first-year university students, specifically tailored to the context of reading "Alice's Adventures in Wonderland," using the autonomous Learning Ability framework (Knowles, 1975). The items cover the following topics:

#### 1) Goal Setting and Planning Skills (5 items)

Questions related to how students set goals for their reading, create plans to understand the text, and follow through with their objectives.

#### 2) Information Acquisition and Analysis Capabilities (5 items)

Items focus on gathering information from the text, interpreting its meaning, and analyzing the underlying themes and messages.

#### 3) Reading Comprehension and Critical Thinking Skills (5 items)

Questions assessing the ability to understand the content of "Alice's Adventures in Wonderland" and critically evaluate the characters, plot, and themes.

#### 4) Problem Solving and Autonomous Learning Skills (5 items)

Items examine how students approach and solve problems encountered while reading and their capacity for autonomous learning and understanding of the text.

#### 5) Cooperation and Communication Skills (5 items)

Questions related to discussing the book with peers, effectively communicating interpretations, and working together to deepen understanding.

#### 6) Ability to Reflect and Adjust (5 items)

Items focus on self-reflection regarding the reading process, adaptability in approaches to understanding the text, and the ability to modify one's interpretation based on new insights.

#### 7) Continuous Learning and Self-regulatory Exploration Capabilities (5 items)

Questions assessing the motivation and ability to engage in ongoing learning about the book, its context, and related literature, as well as Self-regulatory exploration of themes and ideas presented in the text.

Multiple items in the questionnaire cover each topic to ensure a comprehensive assessment of first-year university students' respective skills and capabilities, reading "Alice's Adventures in Wonderland" autonomously

(see the Appendices).

### Data Collection

Questionnaire for answer RQ1 (Table 3, 4, 5)

A rating of 5 means “very agree.”

A rating of 4 means “agrees.”

A rating of 3 means “moderation.”

A rating of 2 means “disagrees.”

A rating of 1 means “very disagree.”

### Data analysis

1) Qualitative data collected through Field notes by coding to the grounded theory and content analysis

2) Quantitative data are analyzed utilizing  $\bar{x}$  and S.D, and the mean value of the suitability score of expert opinions is calculated and compared with the following criteria:

A mean score of 4.51, 5.00 means “very agree” (interpreted as very high)

A mean score of 3.51, 4.50 means “agree” (interpreted as high)

A mean score of 3.01, 3.50 means “moderation” (interpret to modern)

A mean score of 1.51 – 3.00 means “disagree (interpreted as low)

A mean score of 1.00, 1.50 means “very disagree” (interpreted as very low)

Questionnaire for answer RQ1 (Table 3)

A rating of 5 means “very agree.”

A rating of 4 means “agree.”

A rating of 3 means “moderation.”

A rating of 2 means “disagree.”

A rating of 1 means “very disagree.”

Table 1. Questionnaire for answer RQ1

No.	Questions	Level					Remarks
		5	4	3	2	1	
1	Goal-setting and planning skills						
(1)	I can effectively set and achieve individual or team goals.						
(2)	When planning tasks or projects, I consider various possible outcomes and scenarios.						
(3)	I can usually predict the challenges that tasks or projects may face and develop contingency plans in advance.						
(4)	I ensure that resources, time, and personnel are allocated reasonably when making plans.						
(5)	I believe that my goal-setting and planning skills are beneficial for my work or study.						
2	Information acquisition and analysis capabilities						
(1)	I can quickly identify and resolve any issues encountered during the information retrieval.						
(2)	When analyzing information, I can identify key points and potential trends.						
(3)	I often use multiple channels to collect and analyze information to ensure accuracy and completeness.						
(4)	I can use tools or techniques to process and analyze large amounts of information more effectively.						
(5)	My ability to obtain and analyze information is crucial for solving problems and making decisions.						
3	Reading comprehension and critical thinking skills						
(1)	I can quickly understand and grasp the reading material’s main idea and key points.						
(2)	I can identify and evaluate the author’s viewpoints, arguments, and reasoning process when reading.						
(3)	I can use canonical thinking to analyze and evaluate the reliability and value of the information I read.						

(4)	When understanding complex or abstract concepts, I can use my knowledge and experience to explain and apply them.
(5)	Reading comprehension and critical thinking skills are crucial for academic and professional success.
4	Problems solving and autonomous learning skills
(1)	I am delighted with my problem-solving ability.
(2)	I effectively utilize autonomous learning to acquire new knowledge.
(3)	When encountering problems, I can find suitable solutions.
(4)	I often proactively seek new methods or strategies to solve problems.
(5)	I feel that I am highly efficient in solving problems.
5	Cooperation and communication skills
(1)	I am delighted with my communication skills.
(2)	I can communicate and collaborate with team members.
(3)	I can convey my ideas and viewpoints and ensure that team members understand.
(4)	I can usually handle differences and conflicts with others in team projects properly.
(5)	I believe that my communication skills can help improve the overall efficiency and cohesion of the team.
6	Ability to reflect and adjust
(1)	After completing the task, I often reflect and summarize.
(2)	I can use my methods and strategies based on feedback and results.
(3)	I can analyze and adjust my mentality and actions when facing failure or setbacks.
(4)	I believe the ability to reflect and adjust is essential to personal growth.
(5)	I can usually learn from failures and avoid the same mistakes next time.
7	Continuous learning and Self-regulatory exploration capabilities
(1)	I have a very positive attitude towards continuous learning.
(2)	I often proactively seek new learning resources and opportunities.
(3)	I enjoy self-regulation and exploring new knowledge and fields.
(4)	I have sufficient self-discipline and perseverance to engage in continuous learning.
(5)	I have made significant progress in my studies and work in the past period.

## Part 2 for answering research question 2

### 1) Lesson plans

The Lesson plans (experimental group)

The four components of the self-regulatory model:

Class Plan 1: Introduction and Reading Preparation

Time: 90 minutes

Content: Introduction and reading preparation of Alice's Adventures in Wonderland

Import (15 minutes):

Introduce the background of "Alice's Adventures in Wonderland" and stimulate students' interest in the novel.

Step 1: Preparation before reading (25 minutes):

Provide background information on Lewis Carroll and Alice's Adventures in Wonderland to give students an understanding of the novel.

Step 2: Set a reading goal (20 minutes):

Discuss and help students set reading goals, such as understanding the main plot, grasping the main characters, analyzing symbolic meanings, etc.

Step 3: Read in segments (30 minutes):

Divide the novel into appropriate chapters and have students read them in sections. Conduct a brief discussion and summary after each reading.

Class Plan 2: Active Participation and Reading Strategies

Time: 90 minutes

Content: Active participation and reading strategies of Alice's Adventures in Wonderland

Import review (10 minutes):

Review the previous lesson's content and emphasize the importance of reading objectives and segmented reading.

Step 4: Actively participate (25 minutes):

Encourage students to actively participate in the reading process by asking questions, taking notes, recording important events and characters, etc.

Step 5: Use Reading Strategies (30 minutes):

Guide students to use different reading strategies, especially imagination and exploratory thinking, to understand novel fantasy elements.

Summary and feedback (25 minutes):

Discuss students' experiences and gains in using reading strategies, emphasizing the importance of reading strategies in understanding and analyzing texts.

Class Plan 3: Discussion and Thinking

Time: 90 minutes

Content: discussion and thinking of Alice's adventures in Wonderland

Import review (10 minutes):

Review the content of the previous lesson and emphasize the importance of active participation and use of reading strategies.

Step 6: Discussion and Sharing (30 minutes):

Organize group or class discussions where students share their reading experiences, understandings, and perspectives.

Step 7: Guide deep thinking (30 minutes):

Guide students to think about deep-seated issues, such as the author's intention, the symbolic meaning in the text, etc.

Summary and feedback (20 minutes):

Discuss students' deep thinking and understanding of texts, emphasizing the importance of deep thinking in understanding and appreciating literary works.

Class Plan 4: Summary and Application

Time: 90 minutes

Content: Summary and application of Alice's adventures in Wonderland

Import review (10 minutes):

Review the content of the previous class and emphasize the significance of discussion and in-depth thinking.

Step 8: Summary and reflection (30 minutes):

Help students summarize and reflect on their reading experience and gains and improve their Self-regulatory reading ability.

Reading practice (30 minutes):

Give students some reading exercises to apply the reading strategies and thinking skills they have learned.

Course summary and outlook (20 minutes):

Summarize the course content, encourage students to continue reading and thinking, and look forward to the direction and goals of future reading. Through such a classroom arrangement, students will have sufficient time to participate in reading, discussion, communication, and in-depth thinking, and they will apply what they have learned to actual reading in the four classes, thereby cultivating more solid self-regulatory reading abilities. Cooperation and communication skills: Students can actively communicate and discuss with peers or teachers, share reading experiences, interpret opinions, etc., and actively participate in teamwork. Reflection and adjustment ability: Students can reflect on and evaluate their reading process and adjust reading strategies and methods



promptly to improve reading effects and experience. Continuous learning and Self-regulatory exploration ability: Students have the motivation to continue learning and the spirit of Self-regulatory exploration and can continuously explore and discover content and themes related to “Alice in Wonderland”.3. Yunnan Normal University refers to Yunnan Normal University is located in the front of Yunnan, a university located in the southwest border of China.

#### **Control group:**

The control group used traditional self-regulatory methods. Use methods such as teacher lectures, class notes, and after-class homework. This method is a teacher-led teaching process in which students passively receive knowledge. Secondly, the control and experimental groups used the same teaching materials, and the control and experimental groups used the same reading material, “Alice in Wonderland”, to eliminate the influencing factors of the material content. The control group had the same class time and frequency as the experimental group to eliminate the impact of class time and the amount of time receiving education on the results. The control and experimental groups were evaluated in the same way to ensure fairness and comparability of the evaluation. Avoid using interventions in the control group that are different from those in the experimental group. Ensure that the control group’s learning environment is as consistent as possible with the experimental group. Students were randomly divided into groups before the experiment began to ensure that the distributions of the control and experimental groups were similar on other potential factors. Through the above operations, the difference between the control and experimental groups mainly lies in the difference in self-regulatory methods, in which the experimental group uses Self-regulatory learning methods. In contrast, the control group uses traditional self-regulatory methods. This allows for a more straightforward assessment of the impact of Self-regulatory learning methods on students’ improvement in reading ability.

#### 2) Paper test for answer RQ.2 (30 items)

The paper test consists of single-choice questions designed to evaluate the comprehension and critical thinking skills of first-year university students who have read “Alice’s Adventures in Wonderland.” This test aims to measure the effectiveness of autonomous learning teaching methods on their reading comprehension and critical thinking abilities. Each question provides four options (a, b, c, and d) from which the students must choose the correct answer.

The questions will cover various aspects of the book, including plot details, character analysis, thematic exploration, and author intent interpretation. The results of this test will help assess the impact of autonomous learning techniques on the student’s ability to understand and analyze literary texts.

#### Paper test for answer RQ.2

For the test for reading the topic, choose the correct answer: a, b, c, or d.

1. Who is the author of Alice in Wonderland?

- A. Mark Twain
- B. Lewis Carroll
- C. Daniel Defoe
- D. Selma Lagerlöf

2. Why did Alice start her journey to Wonderland?

- A. Chasing a talking rabbit
- B. Jumping into a deep hole
- C. Following a flying cat
- D. The effect of a magic potion

3. Which animal did Alice meet first in the story?

- A. Mad Hatter
- B. Cheshire Cat
- C. Mr. White Rabbit
- D. March Hare

4. What did Alice drink in Wonderland that made her smaller?

- A. Shrinking potion
  - B. Enlarging potion
  - C. Croquet ball
  - D. Magic candy
5. What did Alice eat in Wonderland that made her bigger?
- A. Shrinking potion
  - B. Enlarged cake
  - C. Croquet ball
  - D. Magic candy
6. What game did Alice participate in in Wonderland?
- A. Football game
  - B. Running race
  - C. Croquet game
  - D. Swimming competition
7. Who always appears and disappears mysteriously in the story?
- A. Mr. White Rabbit
  - B. Mad Hatter
  - C. Cheshire Cat
  - D. March Hare
8. Which queen did Alice meet in Wonderland, who always said she wanted to chop off other people's heads?
- A. Queen of Hearts
  - B. Queen of White Peaches
  - C. Queen of Yellow Peaches
  - D. Queen of Blueberries
9. Which animal did Alice help find her lost fan and gloves in the story?
- A. Mr. White Rabbit
  - B. Mad Hatter
  - C. Cheshire Cat
  - D. March Hare
10. Which hat maker did Alice meet in Wonderland, who always had a messy schedule?
- A. Mad Hatter
  - B. Mr. White Rabbit
  - C. Cheshire Cat
  - D. March Hare
11. In the story, who mistook Alice for her maid?
- A. Queen of Hearts
  - B. Queen of White Peaches
  - C. Queen of Yellow Peaches
  - D. Queen of Blueberries
12. Which animal who loves poetry did Alice meet in Wonderland?
- A. Mad Hatter
  - B. Cheshire Cat

- C. Gryphon  
D. Unicorn
13. In the story, why was Alice sentenced to court?  
A. Stealing the Queen's pie  
B. Growing too tall  
C. Growing too small  
D. Talking back to the Queen
14. Which cat who always laughs did Alice meet in Wonderland?  
A. Cheshire Cat  
B. Mad Hatter  
C. Mr. White Rabbit  
D. March Hare
15. At the end of the story, how did Alice return to the real world?  
A. drank the shrinking potion  
B. found an exit  
C. woke up and found it was a dream  
D. was sent back to the real world by the queen
16. Why did Alice fall into the rabbit hole in the story?  
A. Because she was curious and chased the rabbit  
B. Because she slipped  
C. Because she heard the rabbit's call  
D. Because she deliberately wanted to explore
17. After Alice became more minor, which animal did she meet and talk to?  
A. Mouse  
B. Rabbit  
C. Cheshire Cat  
D. Mad Hatter
18. In the story, who told Alice how to grow bigger?  
A. Mr. White Rabbit  
B. Mad Hatter  
C. Cheshire Cat  
D. The words on the enlarged cake
19. Who are the members of the "Mad Tea Party" that Alice met in the story?  
A. Mad Hatter, March Hare and Dormouse  
B. Mr. White Rabbit, Mad Hatter, and Cheshire Cat  
C. Cheshire Cat, March Hare, and Dormouse  
D. Mr. White Rabbit, March Hare, and Dormouse
20. What was Alice asked to do at the "Mad Tea Party"?  
A. Drink tea  
B. Sing  
C. Dance  
D. Tell stories

21. In the story, how did Alice know that she was dreaming?
- A. She met talking animals
  - B. She saw strange visions
  - C. She tried to wake up but failed
  - D. She met a character who told her the truth
22. Which animal did Alice meet in the story that always said “why”?
- A. Mad Hatter
  - B. Cheshire Cat
  - C. Gryphon
  - D. Parrot
23. In the story, how did Alice meet the Knight of Hearts?
- A. In the palace of the Queen of Hearts
  - B. In the forest
  - C. By the river
  - D. At the Mad Tea Party
24. What challenges does the Knight of Hearts offer Alice in the story?
- A. A race
  - B. A croquet match
  - C. A sword fight
  - D. A puzzle game
25. Why does the Queen of Hearts always want to chop off other people’s heads in the story?
- A. Because she has a bad temper
  - B. Because she wants to show her power
  - C. Because she has a habit of doing so
  - D. Because she thinks it is a form of punishment
26. Why does Alice cry at a specific part of the story?
- A. Because she feels lonely
  - B. Because she feels scared
  - C. Because she feels confused
  - D. Because she feels sad
27. In the story, who helps Alice find the exit to the real world?
- A. Mr. White Rabbit
  - B. The Mad Hatter
  - C. The Cheshire Cat
  - D. Alice herself
28. In the story, which animals does Alice participate in the croquet match with?
- A. The Mad Hatter and the March Hare
  - B. The Knight of Hearts and the Jack of Hearts
  - C. The Cheshire Cat and the Gryphon
  - D. Mr. White Rabbit and the Dormouse
29. When Alice wakes up at the end of the story, where does she find herself?
- A. On the riverbank

B. In her sister's room

C. In the rabbit hole

D. In the forest

30. What is the central theme or message of Alice's Adventures in Wonderland?

A. The difference between dreams and reality

B. Growth and self-discovery

C. Adventure and courage

D. Friendship and help

Part 3 for answering RQ. 3

1) Satisfaction question

Likert's (1932) scale is applied as one of the most fundamental and frequently used psychometric tools in educational and social sciences research.

Likert scales commonly comprise either five or seven options. The options on each end are called response anchors. The midpoint is often a neutral item, with positive possibilities on one side and negative options on the other. Each item is given a score from 1 to 5.

2) Student satisfaction refers to the evaluation of the following aspects (25 items)

a) Students' activities in the reading process, including goal setting, reading comprehension, problem-solving, and other abilities (5 items)

b) Students' self-evaluation or peer-evaluation to understand their understanding and reflection on their learning abilities (5 items)

c) Discussions or interviews with students to explore their reading experiences, difficulties, and solutions (5 items)

d) Students' reading works, notes, or summaries to assess their reading comprehension and critical thinking skills (5 items)

e) Students' activities in teamwork or group discussions and evaluate their cooperation and communication abilities (5 items)

### Data analysis

1) Qualitative data collected through Field notes by coding to the grounded theory and content analysis

2) Quantitative data are analyzed using  $\bar{x}$  and S.D, and the mean value of the suitability score of expert opinions is calculated and compared with the following criteria:

A mean score of 4.51–5.00 means “very satisfied”

A mean score of 3.51–4.50 means “satisfied”

A mean score of 3.01–3.50 means “moderation”

A mean score of 1.51–3.00 means “dissatisfied”

A mean score of 1.00–1.50 means “very dissatisfied”

Table 2. Student satisfaction (Questionnaire for answer RQ.3)

No.	Questions	Level					Remarks
		5	4	3	2	1	
1	Activities during reading						
(1)	I am satisfied with my activities in this reading task.						
(2)	I think my reading activities are satisfactory for achieving my learning goals.						
(3)	I think the organization of this reading activity is satisfactory.						
(4)	I am satisfied with the theme and content of this reading activity.						
(5)	Through this reading, I believe that reading activities can improve the satisfaction of reading interest and ability.						
(6)	I am satisfied with the teacher service attitude of this reading activity.						

2	Conduct student self-evaluation or peer evaluation
(1)	My level of satisfaction with my participation in this activity of learning Self-regulatory reading methods.
(2)	My level of satisfaction with my performance in reading the relevant books carefully during the activity.
(3)	I am satisfied with the progress or gains I have made in the Learning Self-regulatory Reading Method activity.
(4)	My satisfaction with the evaluation of my classmates' or friends' attitudes toward participation and performance in the activity of learning Self-regulatory reading methods
(5)	The satisfaction of my classmates' or friends' evaluation of my performance in learning Self-regulatory reading methods is consistent with my performance.
(6)	I am satisfied with my active participation in discussing, sharing, and exchanging experiences during the activity.
3	Conduct discussions or interviews with students
(1)	I feel satisfied with my participation in the discussions or interviews in the activities of the Learning Self-regulatory Reading Methods program
(2)	I feel satisfied with the content and format of the discussions or interviews
(3)	I feel satisfied that the interviews and discussions in this activity enhance learning needs and interests.
(4)	I feel satisfied that the discussions or interviews enhance understanding and improvement of reading methods.
(5)	My satisfaction is that I could fully express my opinions and ideas in the discussions or interviews.
(6)	I am satisfied with how well the discussion or interview enhances communication and interaction with my classmates.
4	Analyze students' reading works, notes or summaries to assess their reading comprehension and critical thinking skills;
(1)	My satisfaction with the methods used to assess their reading comprehension and critical thinking skills by analyzing reading works, notes, or summaries
(2)	The difficulties faced in making reading notes or summaries and satisfaction with the methods taught by the teacher.
(3)	I am satisfied with the steps teachers take during the assessment process.
(4)	I am satisfied with continuing to analyse reading works, notes, or summaries to assess reading comprehension and critical thinking skills.
(5)	My satisfaction with my reading skills and reading habits has improved.
(6)	As assessed by your teacher, I am satisfied with your reading comprehension and critical thinking skills.
5	Activities in teamwork or group discussions and evaluate their cooperation and communication abilities.
(1)	I am satisfied with including teamwork and group discussion sessions in my Self-regulatory reading and learning activities.
(2)	I am satisfied with including teamwork and group discussion to improve my cooperation and communication skills in Self-regulatory reading and learning activities.
(3)	I am satisfied with my performance in teamwork and group discussion.
(4)	I am satisfied with my ability to express myself clearly in teamwork and group discussions.
(5)	I am satisfied with my ability to listen in teamwork and group discussions.
(6)	I am satisfied with my problem-solving and teamwork skills in teamwork and group discussions.

#### 4. Results

Part 1 to answer the research question 1:

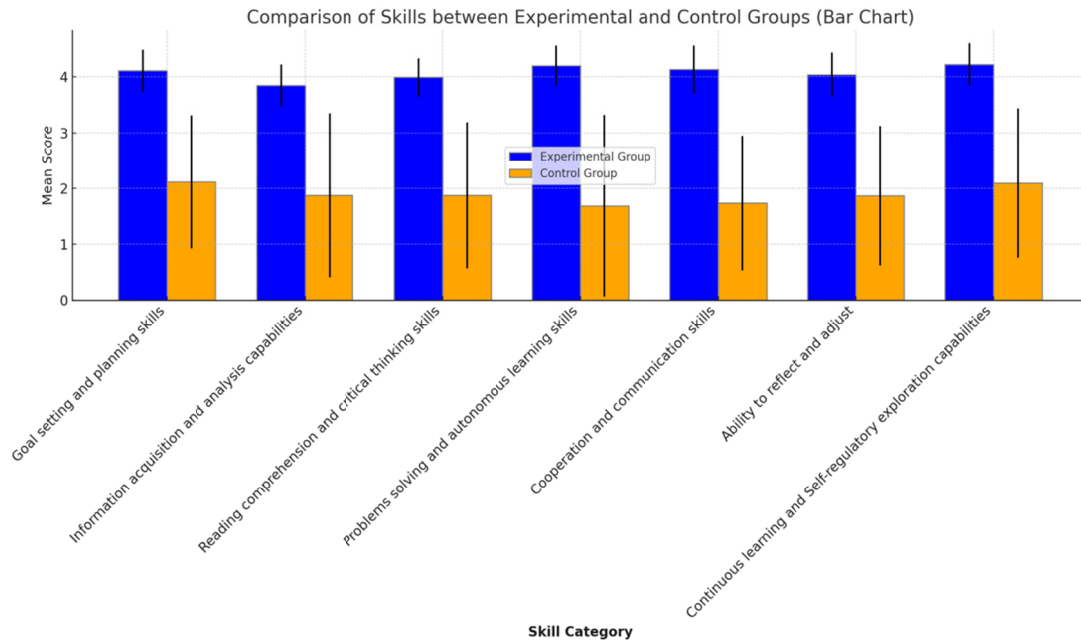


Figure 1. Comparison of skills between experiment and control group

Figure 1 revealed that self-regulation can significantly enhance students' self-regulatory learning abilities. The overall result for the experimental group was an  $\bar{X}$  of  $\bar{X} = 4.11$ , S.D. = 0.40. The interpretation was "agree."

The experimental group could explain the following exciting issues:

- 1) I can effectively communicate and collaborate with team members:  $\bar{X} = 4.89$ , S.D. = 0.50. The interpretation was "strongly agree."
- 2) I often proactively seek new methods or strategies to solve problems:  $\bar{X} = 3.63$ , S.D. = 0.5. The interpretation was "agree."
- 3) I can usually handle differences and conflicts with others properly in team projects:  $\bar{X} = 4.13$ , S.D. = 0.5.

The interpretation was "agree."

Conclusion for the Control Group

The overall result for the control group was an  $\bar{X}$  = 1.91, S.D. = 0.60. The interpretation was "disagree."

The control group could explain the following exciting issues:

- 1) I can quickly identify and resolve any issues encountered during the information retrieval process:  $\bar{X} = 1.13$ , S.D. = 1.5. The interpretation was "disagree."
- 2) When analyzing information, I can identify key points and potential trends:  $\bar{X} = 1.04$ , S.D. = 1.31. The interpretation was "disagree."
- 3) I can usually predict the challenges of tasks or projects and develop contingency plans in advance:  $\bar{X} = 2.46$ , S.D. = 1.8. The interpretation was "disagree."

By comparing the results of the experimental group and the control group, it is clear that self-regulatory methods have a significant effect on enhancing students' self-regulatory learning abilities.

Part 2 to answer the research question 2:

The results presented in Figure 2 are as follows:

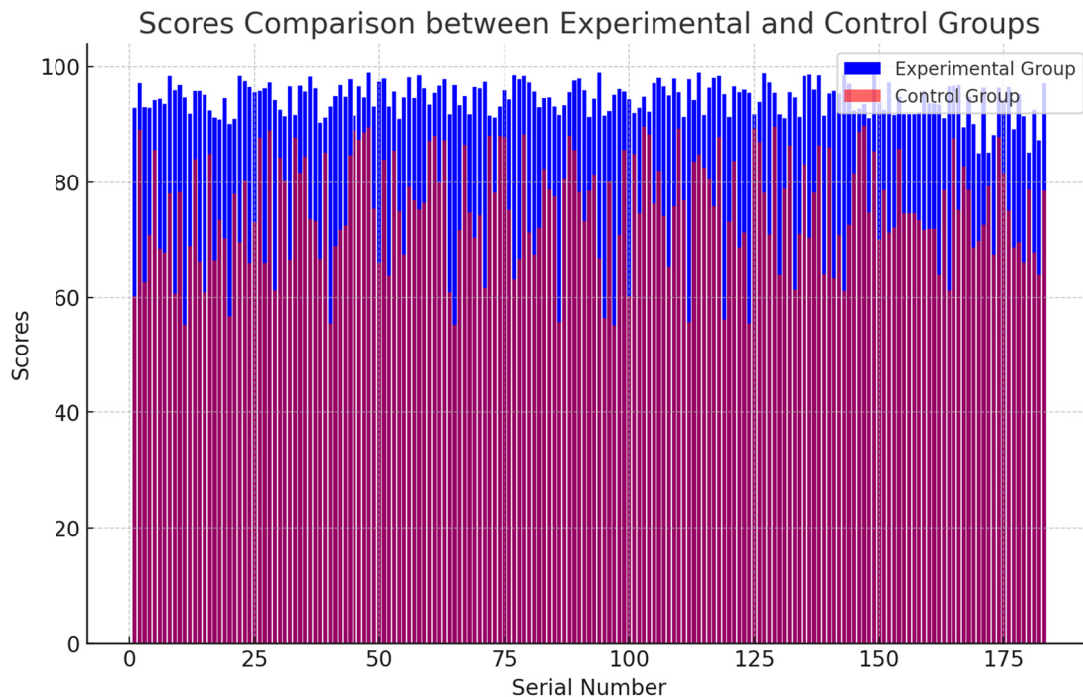


Figure 2. Scores comparison between experimental and control group

The experimental group demonstrated significantly higher scores than the control group across all observed aspects. The score results show that:

1) Average Score: The average score for the experimental group is 94.57, while the average score for the control group is 75.15, with a difference of 19.42 points.

2) Standard Deviation (S.D.): The S.D. for the experimental group is 2.82, whereas for the control group, it is 9.49. This indicates that the scores in the experimental group are more concentrated and have less variability.

3) Variance (statistics): The variance (statistics) for the experimental group is 7.98, while for the control group, it is 90.13. Lower variance indicates that the scores in the experimental group are closer to the mean, showing more consistency in performance.

These data results further support that the experimental group performed better on average and had more concentrated and consistent scores than the control group.

Based on the specific data from Table 4-3, we can interpret the details as follows:

1) Goal Setting and Planning Ability:

Experimental Group Average Score: 94.57

Control Group Average Score: 75.15

Difference: The experimental group outperformed the control group by 19.42 points, indicating better goal-setting and planning skills.

2) Information Acquisition and Analysis Abilities:

Experimental Group Average Score: 97.20

Control Group Average Score: 89.13

Difference: The experimental group scored 8.07 points higher, demonstrating a superior ability to acquire and analyze information.

3) Reading Comprehension and Critical Thinking Skills:

Experimental Group Average Score: 93.04

Control Group Average Score: 62.71



Difference: The experimental group exceeded the control group by 30.33 points, reflecting better reading comprehension and critical thinking.

4) Problem-solving and Autonomous learning Abilities:

Experimental Group Average Score: 92.91

Control Group Average Score: 70.74

Difference: The experimental group was 22.17 points ahead, indicating stronger problem-solving and autonomous learning capabilities.

5) Cooperation and Communication Skills:

Experimental Group Average Score: 94.29

Control Group Average Score: 85.57

Difference: The experimental group outscored the control group by 8.72 points, suggesting better cooperation and communication skills.

6) Ability to Reflect and Adjust:

Experimental Group Average Score: 94.44

Control Group Average Score: 68.34

Difference: The experimental group scored 26.10 points higher, indicating a more remarkable ability to reflect and adjust.

7) Continuous Learning and Self-regulatory Exploration Capabilities:

Experimental Group Average Score: 93.55

Control Group Average Score: 67.67

Difference: The experimental group outperformed the control group by 25.88 points, demonstrating more robust continuous learning and Self-regulatory exploration abilities.

Part 3 to answer the research question 3 Satisfaction Evaluation for answer RQ.3 as shown in Figure 3

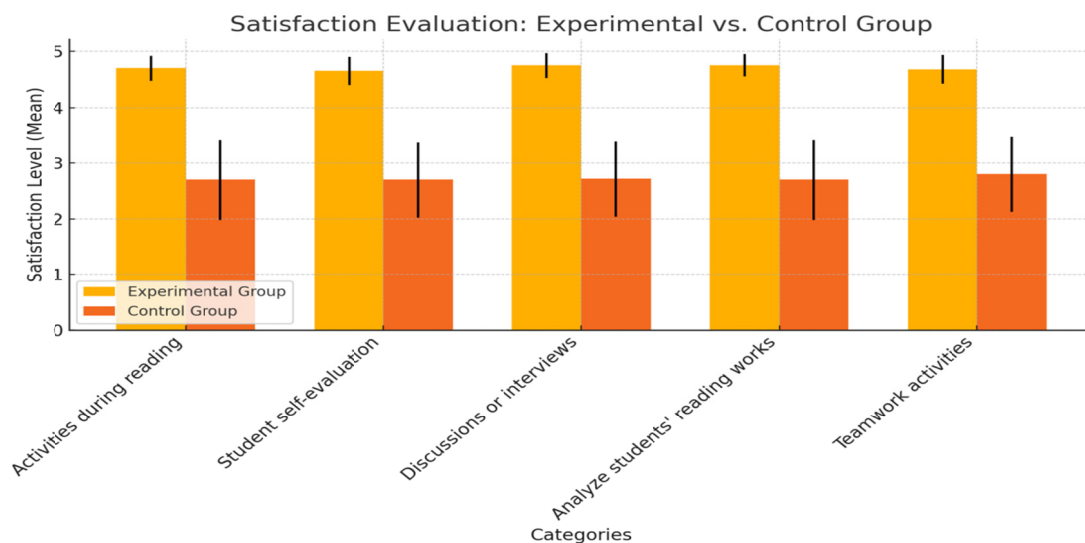


Figure 3. Satisfaction evaluation: experimental vs. control group

It revealed that the bar chart compared the mean satisfaction levels of two groups across five different activities. The experimental group consistently reports higher satisfaction levels than the control group, which is significantly lower.

## 5. Discussions

Part 1 to answer RQ. 1:

Self-regulatory methods significantly enhance students' autonomous learning abilities by promoting goal-setting, information analysis, critical thinking, problem-solving, teamwork, and continuous learning. According to the study, students in the experimental group who used self-regulatory strategies consistently outperformed the control group across all measured aspects. Key areas where the experimental group excelled include goal-setting and planning, reading comprehension, problem-solving, and collaboration. This aligns with Zimmerman's (2000) theory, which emphasizes that effective self-regulation involves setting specific goals, monitoring progress, and adjusting strategies. Research by Bandura (1991) and Cheng and Chau (2016) also supports the idea that self-regulation boosts students' motivation, autonomy, and self-efficacy, leading to better learning outcomes. In contrast, the control group showed deficiencies in these areas, highlighting the importance of integrating self-regulatory strategies into teaching to foster lifelong learning and academic success.

Part 2 to answer RQ. 2:

The experimental group consistently outperformed the control group across all measured aspects, demonstrating the effectiveness of self-regulatory methods in promoting autonomous learning and skill development (Zimmerman, 2000; Cheng & Chau, 2016; Bandura, 1991). In goal-setting and planning, the experimental group scored 94.57 compared to the control group's 75.15, showing better clarity in setting goals and organizing learning paths, which aligns with Zimmerman's (2000) theory on effective self-regulation and Schunk's (1990) findings on motivation and self-efficacy in learning. For information acquisition and analysis, the experimental group scored 97.20, surpassing the control group's 89.13, reflecting superior information literacy and analytical skills (Winne & Hadwin, 1998; Kuhlthau, 2004). In reading comprehension and critical thinking, the experimental group achieved 93.04 versus 62.71 in the control group, indicating enhanced abilities in understanding complex texts and engaging in deeper cognitive processing (Paul & Elder, 2006; Facione, 2011; Cheng & Chau, 2016). In problem-solving and autonomous learning, the experimental group scored 92.91 against 70.74, exhibiting better self-direction and adaptability (Paris & Paris, 2001; Candy, 1991). The experimental group scored 94.29 compared to 85.57 for cooperation and communication, indicating improved teamwork and social skills (Johnson & Johnson, 1989; Goleman, 1995). In reflecting and adjusting, the experimental group scored 94.44 versus 68.34, highlighting more vital reflective abilities (Schön, 1983; Dewey, 1933; Zimmerman, 2000). Finally, for continuous learning and self-regulatory exploration, the experimental group scored 93.55 compared to 67.67, showing a greater willingness for ongoing learning and adaptability (Boekaerts, 1999; Candy, 1991). These findings are consistent with research emphasizing the importance of self-planning, self-control, and self-evaluation for improving student outcomes (Zimmerman, 2000; Cheng & Chau, 2016) and the role of self-efficacy in fostering engagement and achievement (Bandura, 1991; Boekaerts, 1996; Pintrich, 2004). The results suggest that integrating self-regulatory strategies into education can significantly enhance learning experiences, motivating students to become proactive and autonomous learners (Knowles, 1975; Bandura, 1991). This highlights the need for educators to promote self-regulatory practices to support students' academic and personal development better.

Part 3 to answer RQ. 3:

The results from Figure 3 indicate that self-regulatory methods significantly enhance students' satisfaction and self-regulatory learning abilities, with the experimental group reporting high satisfaction ( $\bar{X} = 4.71$ ,  $S.D. = 0.23$ ) and rating various aspects of their learning experience, such as reading tasks and group discussions, as highly engaging. These findings align with Deci and Ryan's (2000) self-determination theory, which emphasizes the role of autonomy, competence, and relatedness in fostering intrinsic motivation. In contrast, the control group reported moderate satisfaction ( $\bar{X} = 2.72$ ,  $S.D. = 0.71$ ), suggesting that traditional methods may not engage students as effectively. The lower satisfaction in the control group supports Hattie's (2009) emphasis on feedback and engagement in enhancing learning outcomes and Dignath and Büttner's (2008) recommendation to incorporate self-regulatory strategies for better academic performance and satisfaction. Zimmerman (2002) explains that self-regulatory learners who set goals and monitor their progress are likelier to report higher satisfaction. This supports Schunk and Ertmer's (2000) assertion that goal-setting and self-monitoring foster a sense of control and satisfaction. As highlighted by Hattie and Timperley (2007), effective feedback and cooperative learning, as discussed by Johnson and Johnson (1999), also contribute to the experimental group's higher satisfaction. The findings suggest that self-regulatory methods create a more engaging learning environment, promoting intrinsic motivation and improving academic outcomes and satisfaction.

## 6. Recommendation

Students should be encouraged to actively participate in learning activities and take ownership of their learning

processes. Activities like group discussions, peer evaluations, and reflective practices can increase engagement and foster a sense of responsibility, thereby enhancing their self-regulatory capabilities.

The results of this study highlight the effectiveness of self-regulatory methods in promoting autonomous learning. Future research could explore the application of these methods across various educational contexts, such as different academic subjects and educational stages, to determine their broader applicability.

Training programs for teachers should emphasize the importance of self-regulation in student learning. Teachers should be trained to guide students in setting realistic learning goals, monitoring their progress, and adjusting strategies. This can create a more supportive learning environment that encourages students to become independent learners.

Since self-regulation is a critical component of lifelong learning, educational institutions should focus on cultivating these skills early on. By promoting self-regulatory practices, students will be better prepared to manage their learning throughout their academic careers and beyond.

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**Authors contributions**

Zhang Jingrui, Chollada Pongpattanyothin, conducted the study design, research problems, methods, and data collection. Chawalit Jujia Narongwat Mingmit, Thanida Sujariththam summarized the results. Chollada Pongpattanyothin drafted and revised the manuscript. All authors read and approved the final manuscript.

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

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**Data sharing statement**

No additional data are available.

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