
Elementary Students' Reflection Tool, Content Suggestions, and Discussion

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ABSTRACT

Children's inability to take ownership of their own learning might lead to a reduction in motivation and effectiveness. Metacognition and reflection can improve learners' thinking and learning efficacy; this is now the most popular strategy among college students, but there are no rules or suggestions for elementary school students. There has been past research on reflection, and through literature review, data collecting and analysis, a questionnaire for students was produced. This study will build on the previously specified reflection tool and investigate the material's usefulness for students. Through expert interviews discussing the content and guidance methods of the reflection questions, as well as interviews with four current elementary school teachers, we understand the actual application and situation of reflection strategies in teaching, which serves as the foundation for subsequent revisions of sentences, questioning methods, and content. The experts were found to have similar ideas about Teaching Reflection and the questionnaire's content. In addition to Teaching Reflection, the process of group competition should begin with topics that are of interest to the students and have a high level of relevance to their lives in order to keep their interest and efficiency in learning reflection. The questionnaire should be tailored to include a specific subject, a clear task, and easy language, and it is preferable to ask students quantitatively about their emotions or feelings at the appropriate time. With these adjustments, the reflection tool and questionnaire material are appropriate for an elementary student.

Keywords: Teaching reflection, Self-assessment, Question category, Learners, Expert interview

INTRODUCTION

While a lack of teacher feedback can hinder learning for elementary school students, self-assessment and reflection based on metacognition can improve their outcomes (Soni et al., 2019; Flavell, 1979). However, current reflection methods used in higher education, like Bain's 5R questions (Bain, 2002), may not be suitable for younger students (Bell, 2007). Existing resources also lack questions tailored to their cognitive abilities and learning needs (Tsai and Chang, 2024).

This study aims to improve elementary students' learning outcomes by developing a guided reflection tool tailored to their needs. Recognizing that higher education reflection methods may not be suitable for younger students, the researchers build on previous research and expert interviews to refine the tool. The goals include understanding current reflective teaching practices, student needs, and revising the

tool based on expert feedback. The outcome is a more effective reflection method for younger learners, promoting academic success. This study will refer to this reflection tool and conduct expert interviews to appropriately revise the content and questioning methods of the items, making it more in line with the usage needs of students, and form a step-by-step reflection tool for students to use for self-evaluation.

APPLICATIONS AND DIMENSIONS OF REFLECTION

Tsai and Chang (2024) proposed a reflection framework for students, based on metacognitive theory, to enhance learning performance (Flavell, 1979; Laksana et al., 2021; Lu and Wang, 2000; Peng and Li, 2008). The researchers adapted Bain's 5R reflection framework, commonly used in higher education (Bain et al., 2002), for elementary students by including the six-step reflective cycle by Gibbs et al. (1988). The steps were simplified for younger learners and included: describing content and feelings, analyzing and categorizing, analyzing viewpoints, drawing conclusions, and planning development. The reflection questions were compiled based on six goals: learning goals, course content, self-awareness, thoughts and feelings, connection and application, and improvement methods.

Prior research has established preliminary reflection journal question content for elementary school students, as shown in Table 1.

Table 1. Content of the reflection tool for elementary students (Tsai and Chang, 2024).

| Types | Guiding | Suggestion |
|-----------------------|--|--|
| Learning Goals | Description of Content | What is this class teaching? What do I want to achieve in this class? |
| | Description of Feelings Analysis and Classification | How do I feel when thinking about the goals? Is it difficult? What goals have I set for myself? Do I understand myself better? |
| | Analysis of Perspectives | Looking at my goals, what do I value the most? What efforts do I need to make to achieve this goal? |
| Course Content | Description of Content | What did I do in class? What did I see? What did I hear? |
| | Description of Feelings | What left a deep impression on me? How did I react when it happened? |
| | Analysis and Classification Analysis of Perspectives | What new or interesting things did I learn from these contents or events? What do I like the most about this class? Why? What do I dislike? Why? |
| Self-Awareness | Description of Content | Do I know what I did well and what I did not do well in class? |
| | Description of Feelings | What are my thoughts after understanding my strengths and weaknesses? Is it helpful? |
| Thoughts and Feelings | Description of Content | Why would the protagonist or author in the textbook do this? Were their thoughts persuasive to you? |
| | Description of Feelings | Would there be a different outcome if I were the protagonist? Why? |
| | Analysis of Perspectives | What is my viewpoint? What are my thoughts about this class? |

(Continued)

Table 1. Continued

| Types | Guiding | Suggestion |
|----------------------------|-----------------------------|---|
| Connection and Application | Description of Content | After this class, what related content or events come to mind? |
| | Description of Feelings | What are my feelings when I think of related events that I have encountered before? |
| | Analysis and Classification | What are the differences and similarities between these two things? |
| | Analysis of Perspectives | How did my views on related issues change and affect me? |
| Improvement Methods | Conclusion | What have I learned from these experiences? |
| | Planning | How will I apply the knowledge I learned in class to my life? When can I use it? |
| | Description of Content | After listening to my classmates' thoughts, is there anything worth learning from them? What is it? |
| | Description of Feelings | Did the teacher or classmates help with my difficulties? What was my reaction when I was helped? |
| | Analysis and Classification | What difficulties did I encounter, what questions did I raise? How did I solve them? |
| | Analysis of Perspectives | What did I learn from my classmates or teacher? |
| | Conclusion | How would I handle these difficulties if they were to occur again? |
| | Planning | What did I not do well this time? How will I adjust in the future? |

METHODS

This study aims to understand the actual application of reflection through expert interviews. From March 28 to April 19, 2024, we invited primary school teachers with more than two years of experience and reflective teaching. Since the use of reflection strategies is not limited to specific subjects, teachers of all subjects were invited. A total of four experts were recruited, including homeroom and subject teachers from different schools. Through these interviews, the content of the reflection was revised to form a student version of reflection questions. The basic information of the expert interviews is shown in Table 2.

Table 2. Basic information of experts.

| Expert Number | Title | Job Tenure | Specialty |
|---------------|-----------------------------|------------|---|
| A | Elementary Homeroom Teacher | 3 years | Social Studies, Chinese, Math, Integrative Activities |
| B | Elementary Subject Teacher | 3 years | Social Studies, Math |
| C | Elementary Homeroom Teacher | 4 years | Chinese, Math |
| D | Elementary Subject Teacher | 2 years | Physical Education |

The following is the interview outline Table 3 which will be used to conduct interviews and ask questions according to each interview's purpose.

Table 3. Expert interview outline.

| Objects | Purpose | Contents |
|---|---|---|
| Elementary teachers with reflective teaching experience | The Current State of Reflective Teaching | <p>Understanding the Use of Reflection</p> <ul style="list-style-type: none"> • When do you use reflective teaching in your class content? What is the students' method of operation? • What difficulties have students encountered when self-evaluating through reflection journals? How were they resolved? • What are the general reactions and feedback from students regarding this teaching method? • What are the difficulties encountered in teaching? What are the causes? <p>Understanding the Form of Reflection</p> <ul style="list-style-type: none"> • What are the teaching objectives of your course? What is the purpose of using reflection? • Can you describe the content and question dimensions of the reflection journal you use? Do you incorporate guidance methods? <p>Understanding the Effectiveness of Reflection</p> <ul style="list-style-type: none"> • What is the overall effectiveness of reflection journals in your class? How many students find it effective? • Approximately what percentage of improvement in students' learning performance or results occurs before and after use? What is the method of evaluating learning outcomes? • Based on your teaching experience, please rate the reflection tool you are currently using on a scale of 1-10, and provide an explanation. What is your willingness to continue using reflective teaching in the future? Why? |
| Elementary teachers | Content of the reflection tool for elementary students (Tsai and Chang, 2024) | <p>Understanding Students' Cognition, Needs, and Abilities</p> <ul style="list-style-type: none"> • Based on the learning cognitive abilities of upper-grade elementary school students, what adjustments need to be made to this question? In terms of wording, vocabulary difficulty, description method, guidance method? • Based on the concentration performance of upper-grade elementary school students, how many questions and how long should the process take to avoid making students feel fatigued? • Based on the attention performance of upper-grade elementary school students, what form of presentation would have the best effect for this question? Static visualization, dynamic, gamification, or verbal explanation? |

RESULTS

This study revises the content of the reflection tool based on the feedback from experts. The following are the responses from each expert regarding the questions.

Current State of Reflective Teaching

Understanding the Use of Reflection

- (1) When do you use reflective teaching in your class content? What is the students' method of operation?

- A: It is mostly used in social studies, once a week, to discuss social issues or the most impressive thing during a week. Students write down their thoughts on post-it, and share with classmates, for a reward.
- B: It is mostly used in social studies for 5–10 minutes each class, discussing social issues and extending the connection with students' life experiences. The methods of 4F or ORID are alternately used for students to use. There is a reward system.
- C: It is mainly used in Chinese class in each class, combining with homework format to discuss questions in groups, related to the course content with reward.
- D: It is mostly used in physical education for 5–10 minutes each class. Students answer orally or demonstrate on stage, and discuss with each other.
- (2) What difficulties have students encountered when self-evaluating through reflection journals? How were they resolved?
- A: For the good-performing students, it's quite easy, and they are also very eager to share. The poor-performing students are also more willing to share their opinions after seeing and hearing from others.
- B: Because the discussion starts from topics they are interested in, they usually can't stop talking and have a strong desire to share.
- C: At the beginning, they didn't know what their feelings were or no feelings. Through some audio-visual teaching materials, they feel the text from hearing and seeing.
- D: Senior students are more stable than juniors. Seniors would think carefully before answering, while juniors usually want to perform on stage.
- (3) What are the difficulties encountered in teaching? What are the causes?
- A: Students' sentences were shorter at the beginning, and this problem can be solved smoothly.
- B: For students' freshness, we need to keep replacing teaching materials (4F/ ORID/ game activities/ drawing). Freshness is very important to them.
- C: They seldom have problems since practice often.
- D: The different personalities of each student can affect teaching, but it is not difficult.

Understanding the Form of Reflection

- (1) What are the teaching objectives of your course? What is the purpose of using reflection?
- A: To enhance concentration and thinking ability.
- B: To increase critical ability and questioning ability.
- C: To enhance concentration, active learning and thinking ability, and to improve the overall atmosphere in the classroom.

- D: To enhance understanding and memories.
- (2) Can you describe the content and question dimensions of the reflection journal you use? Do you incorporate guidance methods?
- A: We use the KWL teaching method combined with course content. K is about the background knowledge related to the teaching content, W encourages students to ask questions actively, and L is where students self-monitor and summarize what they have learned. It will be extended with social issues.
- B: The 4F (Fact/ Feeling/ Finding/ Future) or ORID (Objective/ Reflective/ Interpretive/ Decisional) are the commonly used to ask questions.
- C: It is combined with course content. For Chinese class, it explores step by step from words, idioms, rhetoric, and composition.
- D: It is mainly based on course content, without fixed question dimensions or forms.

Understanding the Effectiveness of Reflection

- (1) What is the overall effectiveness of reflection journals in your class? How many students find it effective?
- A: It is effective for all students, especially those with high abilities.
- B: It is effective for all students. Although the good-performing student progress faster, the poor-performing ones also learn by watching.
- C: It is effective for all students. We will shorten the gap in abilities by leading to learn together.
- D: It is effective for all students, especially senior students.
- (2) Approximately what percentage of improvement in students' learning performance or results occurs before and after use? What is the method of evaluating learning outcomes?
- A: We observe the students' writing situation, and can see obvious progress from the word count.
- B: We observe the students' writing and learning willingness. There is obvious progress.
- C: The improvement percentage needs to be evaluated by entering the class experiment.
- (3) Based on your teaching experience, please rate the reflection tool you are currently using on a scale of 1-10, and provide an explanation. What is your willingness to continue using reflective teaching in the future? Why?
- A: 10, will continue to use in the future.
- B: 10, it is a very important teaching method, will continue to use in the future.
- C: 10, having such tool is very helpful for teaching, will continue to use in the future.
- D: 10, will continue to use in the future.

CONTENT OF THE REFLECTION TOOL FOR ELEMENTARY STUDENTS

Understanding Students' Cognition, Needs, and Abilities

- (1) Based on the concentration performance of upper-grade elementary school students, how many questions and how long should the process take to avoid making students feel fatigued?
 - A: Concentration can be maintained for 40 minutes, currently using 10 to 15 minutes for reflection.
 - B: A four-square or nine-square grid can help them concentrate (include 4 or 9 questions), currently using 5 to 10 minutes for reflection.
 - C: Maximum of 3 to 5 questions, they need time.
 - D: Currently using 5 to 10 minutes for reflection and course summary.
- (2) Based on the attention performance of upper-grade elementary school students, what form of presentation would have the best effect for this question? Static visualization, dynamic, gamification, or verbal explanation?
 - A: Group competitions and encouraging reward system are important to them.
 - B: Engaging students through videos, games, activities, and drawing can enhance learning. Group sharing and a reward system are highly effective, especially for students struggling with text.
 - C: Drawing has a greater impact than text, and audio-visual teaching aids focus better. Hands-on activities or field trips best foster imagination.
 - D: If there is feedback from the teacher, they will have better attention performance and listen carefully to what evaluation the teacher gives them.
- (3) Based on the learning cognitive abilities of upper-grade elementary school students, what adjustments need to be made to this question? In terms of wording, vocabulary difficulty, description method, guidance method?

The detailed content of the adjustment suggestions given by the experts is shown in Table 4.

Table 4. Revision process for reflection journal content.

| | Guiding | Original Contents | Suggestions From the Experts |
|----------------|-------------------------|---|--|
| Learning Goals | Description of Content | What is this class teaching? What do I want to achieve in this class? | (A) Clearly specify what the subject and task of the question are |
| | Description of Feelings | How do I feel when thinking about the goals? Is it difficult? | (A) Add a subject to make the question clearer, think in advance whether the student's default answer will be what you want, if not, it needs to be modified |

(Continued)

Table 4. Continued

| | Guiding | Original Contents | Suggestions From the Experts |
|----------------------------|-----------------------------|---|--|
| | Analysis and Classification | What goals have I set for myself? Do I understand myself better? | (B) Quantify the difficulty level with specific scores (A) How to define self-understanding needs to be clarified (B) It will be clearer for them to compare before and after |
| | Analysis of Perspectives | Looking at my goals, what do I value the most? What efforts do I need to make to achieve this goal? | (A) It's hard to define the proportion, you can provide direction for answering, such as dividing into people, things, objects, or what are online and paper-based respectively, provide a detailed list for reference. (A) You can refer to ORID |
| Course Content | Description of Content | What did I do in class? What did I see? What did I hear? | |
| | Description of Feelings | What left a deep impression on me? How did I react when it happened? | |
| | Analysis and Classification | What new or interesting things did I learn from these contents or events? | (A) You can specify that at least a few points should be listed |
| | Analysis of Perspectives | What do I like the most about this class? Why? What do I dislike? | (B) Change the wording from like and dislike to helpful or not |
| Self-Awareness | Description of Content | Do I know what I did well and what I did not do well in class? | (A) It needs to be restricted to learning content and performance, otherwise, responses like "I don't want to talk anymore" will occur |
| | Description of Feelings | What are my thoughts after understanding my strengths and weaknesses? Is it helpful? | (A) Let them know more specifically, am I supposed to propose a solution strategy now? Or am I just supposed to acknowledge my feelings now? |
| Thoughts and Feelings | Description of Content | Why would the protagonist or author in the textbook do this? Were their thoughts persuasive to you? | (A) Opinions can be explained with the help of opinion cards or opinion tables, listed from 1-5 |
| | Description of Feelings | Would there be a different outcome if I were the protagonist? Why? | (A) They may take the easy way out and write "I don't know" |
| | Analysis of Perspectives | What is my viewpoint? What are my thoughts about this class? | (A) The question "What do you think about this class?" is too similar to the previous one (B) Changing "viewpoint" to "idea" is simpler |
| Connection and Application | Description of Content | After this class, what related content or events come to mind? | (A) More guidance could be provided (C) This part could be done first, starting from their life experiences for imagination, which would make it easier to answer |
| | Description of Feelings | What are my feelings when I think of related events that I have encountered before? | (A) Emphasize that it should follow the previous question and involve perspective-taking |
| | Analysis and Classification | What are the differences and similarities between these two things? | - |

(Continued)

Table 4. Continued

| | Guiding | Original Contents | Suggestions From the Experts |
|---------------------|-----------------------------|---|--|
| | Analysis of Perspectives | How did my views on related issues change and affect me? | (A) Make it more colloquial |
| | Conclusion | What have I learned from these experiences? | (A) Similar to previous questions |
| | Planning | How will I apply the knowledge I learned in class to my life? When can I use it? | (A) Make a summary, the part about connection and application could be moved up, still in the process of recalling thoughts, then comes improvement. |
| Improvement Methods | Description of Content | After listening to my classmates' thoughts, is there anything worth learning from them? What is it? | (A) They might take the easy way out and write "none", change it to an open-ended question to keep them answering |
| | Description of Feelings | Did the teacher or classmates help with my difficulties? What was my reaction when I was helped? | (A) Let them explain through scoring (B) Change "reaction" to "mood" for clarity, whether it's about describing emotions or coping strategies, it needs to be clearly defined |
| | Analysis and Classification | What difficulties did I encounter, what questions did I raise? How did I solve them? | - |
| | Analysis of Perspectives | What did I learn from my classmates or teacher? | (A) "What did I learn" is very similar to the first question about what's worth learning |
| | Conclusion | How would I handle these difficulties if they were to occur again? | (B) Specifically include solutions |
| | Planning | What did I not do well this time? How will I adjust in the future? | |

From the results of the expert interview in Table 6, expert interviews suggest a consensus on question dimensions and wording, endorsing Tsai and Chang (2024) reflection tool for students. Expert (B) also refers to ORID and 4F as useful teaching tools. In terms of teaching, experts suggest encouraging students to think by using more innovative forms and reward mechanisms. At the same time, Experts (A) and (C) also added that incorporating lively elements (such as videos, music, games, etc.) can enhance the overall atmosphere and increase students' willingness to learn. Experts agree that senior students find reflection easier due to their advanced expression and thinking abilities. Experts (B) and (D) also added that despite junior students having lesser concentration and expression abilities, they can still benefit from reflection given extra time and clearer methods. Expert suggestions on question items and teaching methods guide this study and subsequent refinement of a student-friendly reflection tool, as depicted in Table 5.

Table 5. Content of the reflection tool for elementary students (revision).

| Types | Guiding | Revised Contents |
|----------------------------|--|---|
| Learning Goals | Description of Content | What content does the teacher want to teach in this class? What knowledge do I want to learn from this class? Please list 3. |
| | Description of Feelings Analysis and Classification Analysis of Perspectives | When I think about what I want to learn, what are my feelings? On a scale of 1-10, how difficult do I think it is? After I list what I want to learn, what are they all about? What's different from the last list? What do I want to learn the most? In order to learn this, what efforts do I need to make? What resources do I need to find, which books to read, which websites to search for information, which teacher to ask? Please list your methods. |
| Course Content | Description of Content | What did I learn from this class? What have I accomplished from this class? |
| | Description of Feelings Analysis and Classification Analysis of Perspectives | What was my reaction when something impressive happened? Why? What were my feelings at the moment? What are the 3 things I learned from this class? What is the most rewarding thing for me? Why? What do I think was helpful to me in this class? |
| Self-Awareness | Description of Content | In the content and performance of this class, what did I do well and can continue to maintain? What can I improve? |
| Thoughts and Feelings | Description of Feelings | If I could do it again, what actions could I take to make my learning smoother? What are my strengths and weaknesses? |
| | Description of Content | What are the thoughts of the protagonist OOO in the textbook? Do you agree with his views or ideas? Please rate the agreement index from 1-10. |
| Connection and Application | Description of Feelings Analysis of Perspectives | If I were OOO, what would I do? What could be the result of this action? Why? If I were OOO, what would I think? How is it different from the protagonist's thoughts? |
| | Description of Content | Reflecting on my past experiences, what similar event comes to mind? Please describe one. |
| Improvement Methods | Description of Feelings | Following the previous question, if I were the protagonist in the event of the course, how would I feel from a different perspective? |
| | Analysis and Classification Analysis of Perspectives Conclusion Planning | What are the differences and similarities between these two events? What was my first impression of this event? Did my impression of it change after the class? What have I learned from these experiences? What small actions am I willing to take to make the world a better place? |
| Improvement Methods | Description of Content | After the class, what aspects of my classmates' performance are worth learning from? Why? If not, what areas do you think you can continue to improve? |
| | Description of Feelings | Did the teacher or classmates help with my difficulties? How would you rate their help from 1-10? Why? What was my mood at the moment of being helped? |
| | Analysis and Classification Analysis of Perspectives Conclusion | What difficulties did I encounter or what questions did I raise during the process? How were they resolved? What differences in viewpoints do I have with my classmates? What are their thoughts? Write down one thing I learned. If those difficulties arise again, how would I solve them? Please propose a solution. |
| | Planning | What do I think I did not do well this time? Please propose a solution. |

CONCLUSIONS

This study seeks to improve students' learning and motivation by creating a student-friendly reflection tool. Expert interviews helped to understand the current state of reflective teaching and students' needs. The tool will incorporate cooperative competition and topics of interest to students, and its questions will be specific, clear, and simple, with quantifiable emotions or feelings. Teachers across various subjects believe that this tool will be beneficial in actual teaching, helping to adjust students' thinking and learning patterns. Therefore, based on these conclusions, directions for further discussion are developed:

- (1) Elementary teachers adapt teaching methods to the classroom and student abilities, with innovative content often gaining more attention. The study's results could inform future diverse teaching methods, including multimedia.
- (2) Junior students can also reflect, but require age-appropriate teaching methods. More research is suggested for junior students.
- (3) The reflective tool in this study easily confused teachers. It should be modified to help teachers more easily by selecting questions related to their teaching goals.

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