

論文

Development of a Critical Thinking Test: With the Eight Elements of Thought as a Framework

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Although the Ministry of Education, Culture, Sports, Science and Technology (MEXT) has been emphasizing the importance of critical thinking, one of the 21st century competency skills, no specific methods of instruction or evaluation have been suggested in the Course of Study or in its commentary. In an attempt to address this imbalance, the authors introduce a sample English critical thinking appraisal in the form of reading comprehension test based on the eight elements of thought (Paul and Elder, 2006). The eight elements of thought are the “essential dimensions of reasoning that are present whenever and wherever reasoning occurs” (p. 55) and consist of purposes, questions, points of view, information, inferences, concepts, implications and consequences, and assumptions. The sample test has been devised with these elements serving as a basic reference framework to evaluate learners’ critical thinking/reading skills. The test is composed of three sections: basic comprehension questions, critical thinking questions, and text evaluation. Sample answers and comments are also provided. It is the authors’ hope that the test would be of valuable assistance to teachers of English who need instructional and assessment guidance for the development of critical thinking skills in Japanese classrooms.

Key words: critical thinking, eight elements of thought, critical thinking test

1 Introduction

The importance of critical thinking (henceforth CT) skills in Japanese education has long been recognized and emphasized by MEXT (2011, 2015, 2016). For instance, the Japanese School Education Act (1947) stipulates that the upper secondary education should develop learners’ sound criticism of the society (Article 51). However, even if the teacher wants to teach CT or critical reading in English classes, the Course of Study provides no guidance for its instruction, assessment, or evaluation.

This paper is an attempt to improve this situation by introducing a sample CT test for Japanese learners of English in senior high schools and universities. The test is designed based on the idea of the eight elements of thought (henceforth EoT) constituting the “essential dimensions of reasoning” (Paul, 1995; Elder and Paul, 2009; Paul and Elder, 2006, 2013, 2014, 2016; Nosich, 2009). In the following sections, the authors first explain the EoT briefly, and then elaborate on the contents of the test devised.

2 Eight Elements of Thought

Elder, Gorzycki and Elder (2011) state that if we want to think well, we must understand at least the rudiments of thought, most basic structures of thought out of which all thinking is made (p. 33). These basic structures of thought are the eight elements of thought. The EoT can provide a framework for us to reason. In other words, we can be conscious of what aspects we should take into consideration when we need to make some judgment about something for whatever purpose. When, for example, we need to form an opinion about MEXT’s eleventh hour cancellation in November 2019 of the introduction of private English tests for university entrance examinations, we can analyze the issue from the EoT aspects. To do so is tantamount to exercising CT skills, and the current authors are proposing to do the same in English reading classes to develop learners’ critical thinking/reading skills.

What exactly are the EoT? According to Paul and Elder (2016), they are: 1) purpose (goal, objective), 2) question at issue (problem, issue), 3) information (data, facts, reasons, observations, experiences, evidence), 4) interpretation and inference (conclusions, solutions), 5) concepts (theories, definitions, laws, principles, models), 6) assumptions (presuppositions, axioms, taking for granted), 7) implications and consequences, and 8) point of view (frames of reference, perspectives, orientations). These elements are summed up as follows: Whenever we think, we think for a purpose, within a point of view, based on assumptions leading to implications and consequences. We use concepts, ideas, and theories to interpret information, data, facts, and experiences, in order to answer questions, solve problems and resolve issues (Paul & Elder, 2013, p. 7).

They also offer a visual representation of the EoT in the form of a circle with each element occupying one eighth of the circle, which makes it resemble a round pizza made up of eight equal fan-shaped pieces. Nosich (2009) explains that “[the elements of thought] are not numbered because there is no required order” (p. 51).

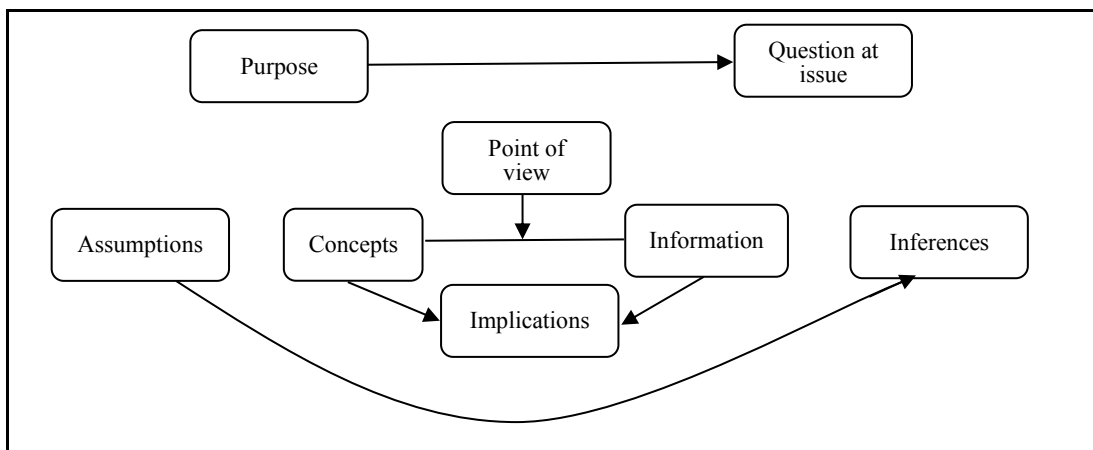


Figure 1: A smiling face representation of the EoT

Note to Figure 1. Lin and Xiang (2019)

Lin and Xiang (2019), on the other hand, adopted “a smiling face” representation of the EoT (Figure 1) as a visual aid for teachers and as an engagement tool for students (p. 103). Despite its cheerful appearance, however, the model fails to explain, among others, why the three units of the elements (the eyes, the nose & the mouth, and the jaw) can be separated from each other, how inferences are made solely from assumptions without information, and why implications are drawn only from concepts and information, not from inferences/conclusions. The authors of this paper devised the following model (Figure 2), which we believe would make a better sense of the EoT.

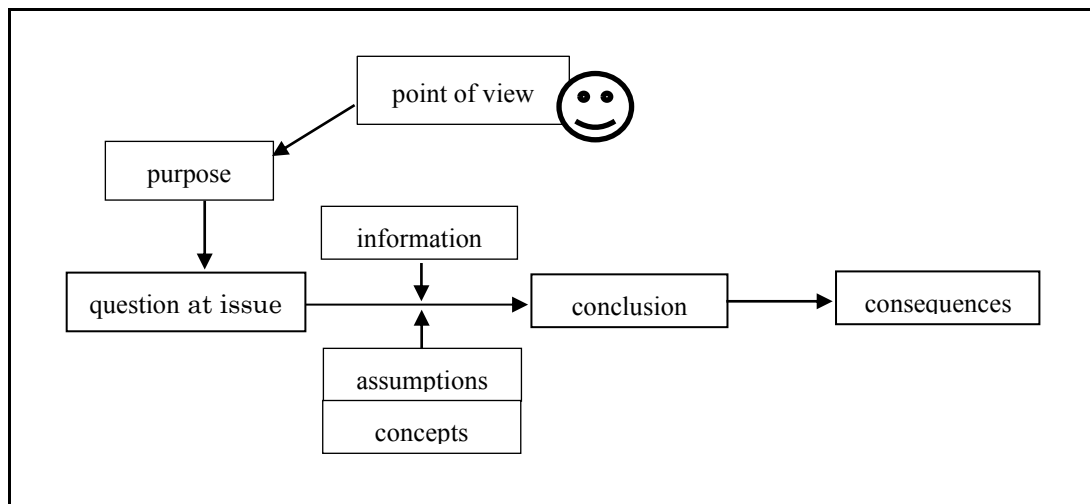


Figure 2: A Model of the EoT

Note to Figure 2. Based on the ideas of Paul and Elder (2006, p. 56)

This is how the authors would explain the model to learners. Thinking is always conducted from some point of view or perspective; we need to see things from somewhere. And as long as thinking is reasonable, it should not be incoherent but directed to getting what we want, be it physical or not. In most cases, our wishes can be translated into problems to be solved or questions to be answered. Whatever solutions/conclusions/inferences we draw from these problems/questions, we need not only objective information/data/facts but also personal assumptions and concepts on which to interpret them. Moreover, whatever conclusions/solutions we decide on, there will inevitably be some consequences/implications. The following are brief explanations of the EoT.

Point of View

All thinking takes place from a certain point of view or frame of reference. Nosich (2009) elaborates that since all reasoning occurs within some point of view, addressing the same question from a different point of view can produce a whole different set of purposes, assumptions, conclusions, and so on (p. 61).

Purpose

Paul and Elder (2006) state that “when humans think about the world, we do not do so randomly but, rather, in line with our goals, desires, needs, and values” (p. 58). In other words, when we think, we think for a purpose, to achieve some goal.

Question at Issue

“All reasoning is an attempt to figure something out, to settle some question, to solve some problem” (Paul & Elder, 1999, p. 4). Hence, the question at issue in a narrative can be the theme of the story.

Conclusion

Paul and Elder (2016) put conclusion, inference, interpretation, solution, and judgment in the same category and explain that “all reasoning contains inferences or interpretations by which we draw conclusions and give meaning to data” (p. 5). Although Lin and Xiang (2019) choose “inference” as the representative term of this category, the current authors prefer “conclusion” because the familiar term would be easier for Japanese learners to understand and remember and it would also be in a better alignment with the preceding element of “question at issue.”

Implications and consequences

Nosich (2009) explains that “the area beyond where [reasoning] ends constitutes the implications and consequences of your reasoning” (p. 56). We argue that it would be pedagogically beneficial for learners to consider the four-part sequence (purpose—question—conclusion—consequence) as the core thread of reasoning as with the research paper organized with the framework of objective—research questions—answers—pedagogic implications.

Information

In order to find an appropriate answer to a question or a suitable solution to a problem, we need to acquire information, data, and evidence. “[R]easoning can only be as sound as the evidence it is based on” (Paul, 1995, p. 160).

Concepts

Concepts are “ideas you use in thinking to understand what is going on and to figure out how to act in a situation” (Elder & Paul, 2009, p. 26) and “[a]ll reasoning is expressed through, and shaped by, concepts and ideas” (Paul & Elder, 2016, p. 5). The truth of these statements can be verified quite easily, for example, in a vain attempt to understand or explain the rules of rugby football without the concepts like maul, ruck, prop, etc.

Assumptions

According to Elder and Paul (2009), assumptions are beliefs we take for granted and hence part of our system of beliefs (p. 25). We are using them, most likely unconsciously, to interpret the world around us. Therefore, it is quite possible that even if provided with exactly the same information two people with different assumptions can come to entirely different conclusions.

3 Critical Thinking Test

By employing these eight elements of thought as the main aspects to be considered in critical thinking evaluation, the current authors devised a CT test for senior high school students and above based on a short narrative text. The test consists of three sections: 1) comprehension questions, 2) CT questions, and 3) text evaluation. In Section 1, the tester can choose either comprehension questions or summary writing, depending on the level of the test-takers. Either way, it is not recommended to skip the first section because a solid understanding of the text is the prerequisite for the following sections. In Section 2, EoT-based but text-related CT questions are asked. In Section 3, learners are to evaluate the main characters and the story. They need to demonstrate their skills to integrate what they have discussed in Section 2 into a coherent critique.

A short narrative text used as the reading material for the test is titled “I Have Never Seen You Before.” It used to be in one of the MEXT-approved high school English textbooks (*Orbit English Reading*).

Critical Thinking Test

- This test consists of three sections: comprehension questions, critical thinking questions, and text evaluation. Read the following story and answer as directed.

I Have Never Seen You Before

“Valentine, you’re not a bad fellow at heart. Stop breaking safes open and live a better life.” That is what the prison officer said when Jimmy Valentine left the prison. Jimmy went back to his house to get his tools for breaking safes open. Two weeks after that, a safe in Jefferson City was robbed. Jimmy then moved to a small town named Elmore. He was walking down the street when he noticed a young lady across the street. He was fascinated by her beauty and fell deeply in love with her. Jimmy decided to live in the town. He started a shoe store. He changed his name to Ralph D. Spencer. His shoe store business did very well. He also made a lot of friends. One of these friends introduced him to the lady, Annabel Adams. Her father owned the Elmore Bank. Ralph and Annabel gradually became friendly and eventually were engaged. He had firmly resolved to give up his old business of crime. He never touched his tools after starting his shoe store.

The Elmore Bank was being modernized and had a new type of safe. Mr. Adams, Annabel’s father, was very proud of it, and he invited many customers to come and see it. Ralph was also invited. The door of the safe was controlled by a timer. After the timer was set, no one, not even the banker himself, could open it. Suddenly there was a cry from a woman. May, Mr. Adams’ granddaughter, had playfully closed the door of the safe. Her younger sister Agatha, a nine-year-old girl, was inside. The old banker said in a panicked voice, “The door can’t be opened because of the timer.” The mother of the daughter cried, “Open the door! Break it open! Can’t anyone do anything? There isn’t enough air inside. She won’t be able to survive.” Annabel turned to Ralph, her large eyes full of tears, and pleaded, “Will you please do something, Ralph?”

Ralph took a deep breath and suddenly stood up. He brought his old tools from his room and pulled off his coat. With this act, Ralph D. Spencer moved aside and Jimmy Valentine took his place. “Stand away from the door, all of you,” he commanded in a loud voice. He put his tools on the table. From this point on, he seemed not to notice that anyone else was near. The others watched as if they had lost the power to move. Immediately, Jimmy went to work on opening the safe. In twenty minutes—faster than he had ever done it before—he opened the safe’s door. Agatha ran into her mother’s arms. Actually, this caused Jimmy a lot of problems. Watching his skill in opening the safe, everyone suspected he might be the bank robber of the bank in Jefferson City. It just so happened that a police officer was among the people present. Knowing this, Jimmy said, “Take me to the police.” The officer said, “I don’t know what you are talking about.... I have never seen you before.” He then slowly walked away, out into the street.

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Section 1: Comprehension Questions (See Appendix A) or **Summary Writing**: Write a short summary of the story of about 140 words. Your summary should include the setting (where and when) of the story, the characters, and how the problem occurred, how it was solved, and how the story ended.

Section 2: CT Questions

Q1: (Purpose & Question at issue)

1) What life issue do you think the author addresses through the actions of the main character?

2) What life issue do you think the author addresses through the actions of the police officer?

Q2: (Conclusion/Inference)

1) What do you think is the author's answer to the life issue of the main character?

2) What do you think is the author's answer to the life issue of the police officer?

3) What do you think Ralph was thinking for the brief moments before he took a deep breath and suddenly stood up?

Q3: (Information)

Is there any important information that you think the police officer should have considered?

Q4: (Assumptions)

Judging from the way the police officer is described in the story, what beliefs do you think the author has about the authority?

Q5: (Concepts*)

Name some key concepts that are highlighted and downplayed in the story.

[* Concepts are abstract ideas we use in thinking to make sense of things. For example, to understand what education is, we need to have concepts like "knowledge" "skills" learning" "development" and so on.]

Q6: (Implications and Consequences)

If the story was real, what consequences would the police officer's action bring to the society?

Q7: (Point of View)

Is there someone in the story whose voice should be heard more? Why?

Section 3: Text Evaluation

1) How do you evaluate the main character and the police officer in the last scene?

2) How do you evaluate the story? Explain both good and bad points of the story.

Before providing sample answers to the questions above, a few words of caution may be in order: the answers are not the only but possible ones. Any answers that can be judged valid should be accepted. In case the test score is needed, one way to allocate points is as follows: one point to each of the 30 question items in Section 1 (or 10 points with summary writing), three points to each of the 10 items in Section 2, and five points to each of the two items in Section 3, which amounts to 70 (or 50 with the choice of summary writing) points in total.

Answers

【Section 1】 Comprehension Questions (omitted)/ Summary Writing (see Appendix B)

【Section 2】 Critical Thinking Questions

● Q1: (Purpose & Question at issue)

Sample Answer:

1) Can even bad people like Jimmy be reformed? Can people change?

2) Is mercy more important than justice?

Comment

Probably the simplest question of purpose is, "What is the purpose of the text/author?" However, Japanese learners would find this question too vague to answer because they usually take school textbooks—and by extension the texts included in them—for granted without any conscious realization as to the authorship of the texts. Their

answer to that question can be “To entertain readers,” which could not be dismissed outright but which is still not the kind of answer expected for the assessment of learners’ critical thinking abilities. Therefore, in this test, all the EoT questions have been made text-specific.

Usually, life issues are internal and/or external conflicts the characters encounter in the course of the story. The conflict or the dilemma of Ralph happened at the climax when he had to choose either to open the safe or to remain silent and do nothing, or more generally either to do the right thing or to succumb to human weakness of selfishness. As for the police officer, he chose not to arrest Ralph and prioritized feelings over reason.

●Q2: (Conclusion/Inference)

Sample Answer

- 1) Even criminals like Jimmy can reform themselves, and sincere efforts to be good would not go unrewarded.
- 2) There should be a time when showing mercy is more important than enforcing laws.
- 3) He could be thinking that if he opened the safe and saved the girl, he could spare Annabel from despair; but he would lose everything; if he did not, he would be able to keep the life as it had been but the girl would die and he would be tormented for the rest of his life with the guilty conscience and the realization that he had been a fake after all.

Comment

The first two questions are questions of conclusion, and the third one is a question of inference.

●Q3: (Information)

Sample Answer

That there are victims of Jimmy’s crime with the owner of the Jefferson City bank at the top of the list.

Comment

The question of Information suggested here is intended to evaluate whether the test-takers can notice the complexities of the story such as Jimmy’s unpunished past crime and the negligence of duty by a law-enforcement officer.

●Q4: (Assumptions)

Sample Answer

That the police are the authority everyone should obey without question.

●Q5: (Concepts)

Sample Answer:

Key concepts highlighted in this story are love, sincerity, mercy, courage, forgiveness, reformation, etc. Key concepts downplayed are law, justice, fairness, responsibility, human rights, public safety, etc.

Comment

Important but underappreciated concepts are those the police officer failed to embody.

●Q6: (Implications and Consequences)

Sample Answer

With an increase in the number of apparently repentant but unpunished criminals and a decrease in the number of law-abiding citizens who still have faith in the police, the society as we know it would soon cease to function.

Comment

It might be worth pointing out that questions of implications and consequences are effective in connecting learners to the real world and helping them break from the strong gravitational pull of the story/author.

●Q7: (Point of View)

Sample Answer

Actually, the voice of everyone in the bank except the police officer should be heard more because it is doubtful that all the people who were present would have accepted his virtual “not-guilty” verdict after having witnessed Ralph, a supposedly ordinary shoe-store owner, open the most modernized timer-controlled safe with his special tools. The owner of the Jefferson City bank must also have a lot to say; he would strongly protest against the release of the prime suspect without even questioning him. Ralph himself may not be happy about the turn of events in the end because he had resolved to settle his past debts once and for all, only to see his sincere confession (“Take me to the police”) dismissed as nonsense (“What are you talking about?”). Moreover, should he feel exulted over the police officer’s supposed leniency, his determination to repent and to prove truly worthy of Annabel’s love could not help but be interpreted as spur-of-the-moment and temporary.

Comment

One of the point-of-view questions suggested by Paul and Elder (2009) is “Is there another reasonable way to look at this situation?” (p. 27). If this story is looked at from different viewpoints other than those of Ralph and the police officer, it will provide a quite different read. The question of viewpoint above can make the learners realize that the story seems to have a happy ending but leaving many questions unanswered.

【Section 3】 Text Evaluation

Sample answer 1)

The main character is admirable in saving the girl at the expense of his promised future. It was not just a girl that he successfully retrieved from the safe; it was also his own reformation as is indicated by O. Henry’s original story title: A Retrieved Reformation. However, it should not be forgotten that he did not reveal his past voluntarily but this incident forced him to.

Some may argue that we should not criticize the police officer as if in the real world. I have a different opinion. He is portrayed as a police officer, who I believe should be understood as such even in the story, i.e. as someone who has the power to arrest criminals. That is the very reason why his decision not to do so with Ralph came as a pleasant shock to readers as well as why the author of this story could expect that reaction from them. However, with power comes responsibility. If he is a police officer, he should also have a sworn responsibility to protect the general public from criminals of all sorts. By letting Jimmy/Ralph go, he deliberately chose to neglect his duty, abandoning his responsibilities. How then could I trust him, let alone admire him as is probably expected by the author? Law-enforcement officers who overstep their boundaries of authority are a danger to society.

Sample Answer 2)

What is good about the story is that it gives us a hope that humans can overcome their selfish desires and cowardice and become courageous and altruistic.

What is bad about the story is that it characterizes the police officer as a kind-hearted generous person. If only I could detect any hint of agony on his part, caught between his sense of responsibility as a police officer and his personal wish to maintain everyone’s happiness, I could relate to him and be more sympathetic. But he showed no such sign or even the tiniest hint of hesitation in his response to Ralph/Jimmy.

I think that this whole story depends on the author’s assumption that people in the bank, as well as the readers of this story, would accept the police officer’ decision not to arrest Ralph without question. However, he has not been entrusted with such an absolute authority. The story gives an impression that it has a happy ending but I doubt it. Everyone now knows what Ralph was not and what he really was, and it would be impossible for him and everyone to go back to the life as it had been. I wonder if the author truly understands those implications and consequences they story entails.

3 Conclusion

This paper introduced a critical thinking test based on an easy reading material with the eight elements of thought as its evaluation criteria. The EoT, whose potential has not been fully acknowledged or explored, would provide us with a much-needed guidance on the instruction and evaluation of CT skills in Japan. It is the authors' hope that this prototypical test will be found useful by teachers and result in further refinement of the sample questions and answers after real administrations of the test in the classrooms.

Acknowledgements

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Appendix A

Section 1: Comprehension Questions

<Part 1>

Factual Questions

1. Who told Jimmy that he was not a bad person?
2. Where did Jimmy decide to live after he was released from the prison?
3. What business did he begin?
4. What new name did he start to use?
5. What was the occupation (job) of Annabel's father?
6. Did Ralph and Annabel get married?

Inferential Questions

7. Who do you think robbed the bank in Jefferson City?
8. Why do you think Ralph had determined never to rob a bank again?
9. What kind of person do you think Ralph is? What makes you think so?
10. Do you think Ralph would later tell Annabel about his true identity? Why or why not?

<Part 2>

Factual Questions

1. What was special about the safe Mr. Adams showed to people?
2. Who did Mr. Adams invite to his bank?
3. What would happen once the timer was set?
4. Who was locked in the safe?
5. Who locked her in the safe?
6. Why was the mother worried that her daughter might not survive in the safe?
7. What did Annabel do?

Inferential Questions

8. Why do you think Mr. Adams invited people to his bank?
9. Who was the woman most likely to be that cried suddenly?
10. What is the relationship between Annabel and Agatha? Mother and daughter?

<Part 3>

Factual Questions

1. What were "his old tools" for? For repairing shoes?
2. What does "Ralph D. Spencer moved aside and Jimmy Valentine took his place" mean?
3. What were the other people doing while Jimmy was working on the safe?
4. Did Ralph successfully rescue the girl?
5. What did the people in the bank think of Jimmy?
6. Who suspected he might be the bank robber of the Jefferson City?
7. Did the police officer take Ralph/Jimmy to the police station?

Inferential Questions

8. Why do you think everyone seemed to have lost the power to move?
9. The text says, "Knowing this." What does "this" mean?
10. Why do you think the police officer said he didn't know Ralph?

Appendix B

Section 1: Summary writing

Sample answer

Jimmy had been in prison for breaking safes. After his release, he soon robbed a bank again, escaped to a small town, and changed his name to Ralph Spencer. He met a woman named Annabel and became engaged with her. One day, Mr. Adams, Annabel's father, invited his customers and Ralph to his bank to show them his latest model of safe. One of his grandchildren was accidentally locked inside the safe. Even Mr. Adams couldn't open it. Pleading by his fiancée and knowing that the girl would soon die without his help, Ralph decided to open the safe and succeeded. But everyone suspected him to be a bank robber. A police officer happened to be there. When Ralph told him to take him to the police, he said he didn't know him and walked out of the bank. (139 words)

Notes

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