

## **CHAPTER 6**

### **THE THIRD CYCLE**

Before the third cycle, I adjusted the program based on suggestion given in Section 5.8. The third cohort of student participants was invited. The three pairs of 8<sup>th</sup> graders spent one hour working on the program at the beginning of their first semester in the fall of the year 2006. The selected participants performed similarly in the English class in their previous semester as those in the first and second cycles. The three pairs were labeled as Pair No. 7, Pair No. 8, and Pair No. 9. Below is what the participants' interaction with the program in the third cycle.

#### 6.1 Scene 1: Comprehension of the Detective Story

As explained in the prototype (Section 3.4.2), in Scene 1, the participants were expected to obtain information from Scene 1 in order to have a good understanding of the plot. In the first two cycles, the participants were indeed not used to the authenticity of the sound clip. However, they still could obtain the main idea by listening to the clip many times. In the third cycle, the participants also reacted in similar way. Pair No. 7 could not obtain the meaning of the sound clip until they listened to it three times. Pair No. 8 and Pair No. 9 also listened to the clip twice before they could understand what the man was saying in the sound clip. To conclude, in three cycles of observation, the participants at first were not used to the sound of a British accent. However, by listening to it several times, they managed to comprehend the general meaning of the sound clip. Therefore, the sound clip is evaluated as workable in the program design of this study.

## 6.2 Task 1, 3, and 4: Speaking Tasks

In Task 1, the participants were asked to engage in a role play. In Task 4, they had to report to Holmes what they had found and what inferences they made in Task 3. In the first cycle, the participants tended to skip the speaking tasks. In the second cycle, the participants had less temptation to skip the speaking task and to jot down lines before recording their responses into the tape recorder. This change might be due to the encouragement that the researcher gave to the participants. This support was also given to the participants in the third cycle. The participants' reactions and their performance are discussed in the following section.

### 6.2.1 *The Participants' Reactions*

The participants' reactions can be discussed in two aspects: (1) Less temptation to skip the speaking task, and (2) Less temptation to jot down lines.

(1) *Less temptation to skip the speaking task.* In the third cycle, the participants did not show much tendency of skipping the task. Three pairs all engaged in speaking tasks after reading the instruction on the screen. Only Pair No. 9 expressed hesitation in doing Task 1. Du of Pair No. 9 said to his partner, "Maybe you could do this task on your own." Then his partner asked the researcher, "Are we required to use the tape recorder?" The researcher told them that this task was designed for pairs' collaboration, and that the use of the tape recorder was necessary for fluency practice. Then this pair began to compose the response. After recording two lines, they clicked on a button to go to the next page. Then the researcher intervened, saying that they were required to finish the task. Therefore, Du rushed his partner to compose more lines while murmuring to himself, "I really have not experienced this kind of recording task before." Du also asked the researcher again, "Is it okay to let Chen (his

partner) do the recording by himself? What would happen when the time is up?"

During Du's hesitation, Chen finished composing the lines. They rehearsed once and then recorded the contents into the tape recorder. After finishing the task, Du said, "It is quite successful. I am happy about that" (F9-4).

From previous descriptions, it could be observed that Pair No. 9, especially Du, was anxious about the task. First Du tended to escape from the task by asking his partner to do it alone; then they recorded only one part of the required contents, skipping the other three parts; finally, Du expressed his anxiety and his wish to escape from the task, but still they managed to finish the task in the end. Compared with the second cycle, in which Pair No. 5 also skipped the speaking task, one out of three pairs in both the second and the third cycle showed tendency of skipping the speaking task. However, this tendency was less emphatic than that took place in the first cycle. Therefore, it could be concluded that first, the speaking task caused the participants to feel anxious to a certain degree. Second, the teacher's support (in the second and third cycle) lowered the participants' anxiety.

(2) *Less temptation to jot down lines.* In the third cycle, the participants, the same as the participants in the second cycle, were encouraged to try not to write down each line when doing the speaking task. This reminder was given at the beginning of the program and on the screen of the speaking tasks. The participants in the third cycle were observed to restrain themselves from jotting down lines during the speaking task. For example, Pair No. 7 in Task 1 first searched for the answers of the 4WH questions in the previous scenes. Then they negotiated and rehearsed the lines with each other. Before they were ready to record the dialogue into the tape recorder, Hun of his pair suggested, "Let's write down some information" (F7-4-13). Pair No. 8 reminded each other not to write down lines on the paper. They composed their lines

by using moment-to-moment oral adjustments. When using the tape recorder, they pushed down the “pause” button when one of the partners forgot his line (F8-4 and F8-8). As for Pair No. 9, one of the members, Chen, said, “It is better not to write down lines.” However, his partner, Du, was very anxious as discussed before. Therefore, Chen only wrote down lines that Du was in charge of saying (F9-4) in the role play of Task 1. And when doing Task 4, Chen rehearsed and recorded by himself without writing down any lines on the paper.

From the description above, it could be observed that the participants used similar strategies to cope with the temptation of jotting down lines as how the participants did in the second cycle. The strategies included delaying the writing until the final version of dialogue contents emerged (Pair No. 7) and using the “pause” button on the tape recorder (Pair No. 8). Both strategies were used by the participants in the second cycle, and these strategies were evaluated acceptable as discussed in 5.2.1. Besides, the participants (Pair No. 8 and No. 9) brought up the reminder, “It is better not to write down lines” during the speaking task. Since the participants were selected high-achievers, the reminder (also an encouragement) allowed the participants’ autonomy in deciding how they achieved the goal. Pair No. 8 accomplished the task without writing down lines but with the help of the “pause” button, and Chen of Pair No. 9 compromised by writing down parts of the dialogue for his partner, who was anxious about speaking. As for Chen himself, he did not write down any lines for his part, both in Task 1 and Task 4. Compared with the first cycle, the participants in the second and third cycle kept the reminder of trying not to write down lines in their mind and made every effort to achieve this goal. This might imply that once the program design sets reasonable expectations for learners, they will accomplish the goal in their own way.

### 6.2.2 The Participants' Performance

This section discusses the quality of the participants' performance. In the second cycle, the participants composed richer contents for Task 1, due to the adjustment of deleting the sentence pattern clue "There is..." but instead adding the contents clues of the 4WH questions. However, it was also found that the four WH clues presenting in English limited the participants in making complete sentences for the lines of the policeman's role. Thus, it was suggested to present the four WH clues in Chinese (L1) in order to leave space for the participants to think about their own lines. Also, a reminder of "Please use complete sentences" was provided on the screen. The adjustment was showed in Figure 6.1. Other parts of Task 1 and Task 4 were maintained the same way as how they were in the second cycle.

**Task 1 : Report**

Holmes is busy,所以要求你們用英文幫他報警.

- 根據剛才看到的細節,用1分鐘計劃待會要怎麼說.  
可以按下面向左的鍵頭 再看 一次故事
- 用錄音機錄下對話,一個人當policeman,  
一個人當報案的人.
- Policeman要問的內容:**  
(請用完整的句子來問)

人:  
事:  
時:  
地:

- You only have 10 minutes. 可先練習再錄音  
請背台詞,盡量不要在紙上寫下每一句話.

09:53

MENU

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Figure 6.1. Task 1: Report

In Task 1, the participants were asked to design a role-play, reporting to the police what had happened in Holmes' house. The contents that the participants created in the third cycle were as follows.

Excerpt 6.1

●(Pair No. 7)

Huan: *What happened?*

Jane: *An old man died.*

Huan: *When did he died [sic]?*

Jane: (murmuring)

Huan: *Where are you?*

Jane: *We are in my house.*

●(Pair No. 8)

Gan: *Police officer, I saw a man dead [sic].*

Dan: *Oh, what's his name?*

Gan: *I don't know his name.*

Dan: *What's wrong with him?*

Gan: *He say [sic] he needs help and some people is kill [sic] him.*

Dan: *When to kill him? [sic]*

Gan: *He dead [sic] in the afternoon.*

Dan: *Where did he die?*

Gan: *He dead [sic] in Holmes' house.*

●(Pair No. 9)

Du: *What's wrong?*

Chen: *Someone died. Please help him.*

Du: *Do you know him?*

Chen: *No, I don't know. I don't know him.*

Du: *Where is that?*

Chen: *At my home.*

Du: *What time is that?*

Chen: *At [sic] the afternoon.*

Du: *Okay.*

From the excerpt, it is possible to analyze: accuracy, complexity, and fluency. In terms of accuracy, words like “die” and “dead” were incorrectly used in sentences like “When did he died?” “I saw a man dead” or “He dead in the afternoon.” These mistakes were acceptable, since the structure of past tense had not been introduced to the participants. However, phrases like “he say” and “some people is kill him” and “at the afternoon” were grammatically wrong.

Second, in terms of complexity, all three pairs produced at least 4 lines of dialogue each, on par with the pairs in the second cycle. Compared with the first cycle though, in which the participants only composed three lines on average, pairs in the second and third cycles had a vast improvement. This suggested that the content clues, the 4WH words, helped the participants compose richer content. Besides, the participants in the third cycle composed complete sentences for the police role, while in the second cycle incomplete ones. This improvement might be due to the content clues in English (L2) being changed into Chinese (L1). Also, the participants in the third cycle were reminded of using complete sentences to make their dialogue. These adjustments therefore encouraged the participants to avoid using the 4WH words as their only lines. Instead, they had to use their own words to compose the lines for the role of the police. Thus, the decision of presenting the 4WH clues in Chinese (L1) was considered successful.

Third, in terms of fluency, the participants moderately achieved fluency. As discussed in 6.2.1, the participants used strategies to cope with the cognitive burden in composing and speaking lines. These strategies help them to record a fluent dialogue into the tape recorder. As discussed in the second cycle, though these strategies might slightly defeat the purpose of fluency practice under real-time pressure, the participants' reactions could be understood when considering the fact that they have seldom had the experience of this kind of speaking task.

Task 4 in the third cycle maintained the same design as that in the first two cycles. In the previous two cycles, it was found the sentence patterns and contents clues helped the participants to generate rich contents. Thus, in this cycle, it was expected to obtain similar performances as in previous ones. Excerpt 6.2 was the participants' product.

## Excerpt 6.2

## ●(Pair No. 7)

Huan: *We guess he is a businessman because he wears a [sic] noble clothes.*

Jane: *There is a pen in his right pocket, so we think he is a right handed [sic].*

Huan: *We guess he walks for a long way, because his boot is dirty.*

## ●(Pair No. 8)

Gan: *We guess he is a butler of a big house, because his clothes is [sic] noble.*

Gan: (He pressed the pause button on the recorder and quietly rehearsed to himself.) *And there is a pen in his right pocket, so we think he is right-handed.*

Gan: (He pressed the pause button and designed line for Dan: “We guess he walks for a long way, because his boots are dirty.”)

Dan: *We guess he walks for a long way, because (..)he(..) (xxx) is dirty.*

Gan (quietly corrected Dan that “his boot is dirty”).

## ●(Pair No. 9)

Chen: *His cloth is noble, and there is a pen in the right pocket, and the boots are dirty; so we think he walked a [sic] long way.*

Three elements of accuracy, complexity, and fluency were again used for analysis.

First, in terms of accuracy, only minor grammatical errors appeared in the participants’ product. For example, the word “clothes” was treated as if was the singular form of the noun, and the word “right-handed” as a noun. These mistakes also appeared in the first two cycles. Besides, in sentence pattern use, Pair No. 7 and Pair No. 8 correctly used both sentence pattern clues, “We guess...because...” and “There is...so we think...” in their dialogue. However, Pair No. 9 wrongly used the sentence pattern clue and only partially expressed their inference that the man walked for a long way. Second, on complexity, both Pair No. 7 and Pair No. 8 used two pieces of evidence, namely, the pen and the boot to support their inferences. Pair No. 9, though mentioned the clothes and the pen of the dead man, but did not further explain their inferences for each piece of evidence. Third, on fluency, all three pairs generally could speak fluently into the tape recorder, though Pair No. 7 had jotted down the lines before recording, and Pair No. 8 used the pause button to rehearse and give prompts to each other.



To conclude, three cycles of observation suggests that (1) For Task 1, the open-ended speaking task, sentence pattern clues might limit the participants' performance, while content clues could stimulate more products, (2) For Task 1, presenting the 4WH words in Chinese could avoid the participants from directing taking those words as incomplete lines in their dialogue, and (3) For Task 4, the speaking task with high demand on structure, both sentence pattern clues and content clues are necessary in order to help learners generate satisfying products.

### 6.3 Task 2: Note-taking Task

In Task 2, the note-taking task, the participants were asked to collect evidence from the outfit of the dead man in Scene 2 and then use target sentence patterns to make notes in the program. In the first cycle, the participants used incomplete sentences when they took the note on the screen. In the second cycle, the participants were successfully guided to type in complete sentences. It might due to that the adding of the preposition “in” in the structure clue, “There is...” and another structure clue “He wears...” Therefore, in the third cycle, Task 2 remained unchanged. The following is the contents that the participants produced in the third cycle.

#### Excerpt 6.3

##### ●(Pair No. 7)

- (a)He wears a noble clothes.
- (b)There is a pen in right pocket; there is nothing in left pocket.
- (c)His fingers have some dirt.
- (d)The boots are dirty, the socks smells.

##### ●(Pair No. 8)

- (a)He wears noble clothes.
- (b)There is a pen in the right pocket and there is not thing in the left pockets.
- (c)There is some dirt.
- (d)The boots are dirty. His socks are smells.

##### ●(Pair No. 9)

- (a) He wears noble clothes.
- (b) There is a pen in the right pocket and nothing.
- (c) There is earth in fingers.
- (d) The boots are dirty.

In the excerpt, Pair No. 7 made all of their four sentences in a complete way. Pair No. 8 and No. 9 made three complete sentences out of four. The incomplete sentences were Sentence (c) of Pair No. 8 and Sentence (b) of Pair No. 9. These sentences wrote, “There is some dirt” and “There is a pen in the right pocket and nothing.” Besides, three pairs all used the target sentence pattern clues, “There is...in...” and “He wears...” in their product. Generally speaking, pairs in the third cycle mostly could use complete sentences to do the note-taking task, as how pairs in the second cycle did. From three cycles of observation, it could be concluded that the adjustment for the sentence pattern clues was necessary.

#### 6.4 Scene 3: Matching

In Scene 3, the matching task, the participants were asked to match the vocabulary with the correct pictures on the screen. In the first cycle, some of the participants were not sure how to drag the mouse in order to do the matching. Besides that, the participants also had the tendency to redo the matching when they did not score 100%; however, the design did not allow them to do so. Therefore, in the second cycle, an instruction on how to drag the mouse was provided; also, a “Try again” button was put beside the scoring button. The participants’ reactions in the second cycle did not show hesitation in dragging the mouse. Also, they pressed the “Try again” button to readjust their answers when they did not score 100%. Their reactions indicated that the adjustments worked well. Therefore, the design of the matching task was maintained in the third cycle.

In the third cycle, Pair No. 7 read the instructions and successfully used the mouse to do the matching exercise. Then they score 100% without the need to use the “Try again” button. As for Pair No. 8, Gan pointed at the screen to instruct his partner, Dan, how to match the vocabulary with the correct pictures. They also scored 100 %. As for Pair No. 9, they followed the instructions and scored 80% the first time. Then they pressed the button to match the pictures again. Generally speaking, the participants could smoothly drag the mouse to do the matching. Also, when they incorrectly matched the pictures (Pair No. 8), the participants did not give up but pressed the “redo” button to obtain a score of 100%. The participants in this cycle reacted similar with those in the second cycle. Therefore, it could be concluded that the adjustments of the instruction and the “Try again” button were necessary for the program.

### 6.5 Task 5: Giving Orders

In this task, the participants were required to record the process of obtaining the unknown powder on the dead man’s fingers. In the second cycle, the participants had a lower tendency to write down lines before recording. Besides, they did not show preference for the sound file like the participants in the first cycle did. (The sound file was behind each picture of the vocabulary word; it was designed to help the participants accomplish the task.) Based on the participants’ reactions, the reminder of trying not to write down lines was kept; also, the design of the sound file maintained unchanged in order to provide more information during the third cycle.

In the third cycle, none of the three pairs jotted down lines before they recorded their process. Pair No. 7 first discussed possible steps of how to obtain the powder.

Then Jane of this pair orally rehearsed for the first time. Then they clicked on the pictures of the wax and the match to listen to the sound clip. Jane rehearsed for a few times and recorded, “Go to the desk and take the match. Light the candle then drip wax on the hand.” Gan of Pair No. 8 murmured to himself, rehearsed once, and then directly recorded the contents into the recorder: “Mr. Holmes, we think you can light the candle and drip wax on the man’s finger, and then you can get the powder on his finger.” As for Pair No. 9, they were very nervous about the timer counting down. Chen said, “The task drives me crazy. What are we going to do?” His partner rushed him to think through the steps. Then Chen orally rehearsed to himself, while his partner kept reminding him how many minutes they still had. Chen recorded: “Take the wax to the desk and go to light the candle and drip it on the hand.” Three pairs all orally composed and rehearsed their lines without relying on writing the sentences down on the paper. After the rehearsal, they fluently recorded their contents into the tape recorder. This process thus was evaluated to achieve the goal of fluency practice. From the reactions of the participants in the second and the third cycle, it could be concluded that the reminder of trying not to write down lines worked well for this kind of task.

Besides, all three pairs showed their interests in the sound clips behind the vocabulary pictures. Pair No. 7 asked, “Are the sound clips recorded by you (the researcher)?” Pair No.8 and Pair No. 9 also asked the same question after they listened to the sound files. The participants in the third cycle did not indicate that the sound clips helped a lot in this task, as the participants in the first cycle did. However, when knowing that the sound clips were recorded by me, their surprise and smile suggested that they liked the sound clips. As a program designer and a teacher, I obtained insight from their reactions that the human factor, in this case the teacher’s

own sound, plays a role to shorten the psychological distance between the computer and the learner; also, the familiarity toward the teachers' sound motivates the learner in doing a task which they have not experienced before. From observation of the three cycles, it could be concluded that the design of the sound clips worked well in the CSCL program.

#### 6.6 Scene 4: Detective Work

In Scene 4, the participants were asked to read the results of the gunpowder experiment and discuss about (1) What could have happened in the shooting situation, and (2) What does it mean when witnessing a pen in the dead man's right pocket? In the second cycle, only one pair successfully (1) noticed the key clue that the back of the hand would collect gunpowder after firing a gun (on the illustration page), and (2) noticed the conflict between the inference that the dead man was right-handed and the inference that the shooter shot the gun using his left hand. As discussed in the prototype (Section 3.4.2), this conflict was critical for making the final decision on whether the dead man was the real murderer or not. The participants' failure in the previous cycles suggested using the same expression in English for the key clue, the back of the hand, in the experiment and the illustration page in order to remind the participants of the clue. Also, the key clue's font could be made more noticeable in order to catch the participants' eye.

*Scene 4: Findings...*

Holms has a special liquid.  
You can put the powder into the liquid.  
This liquid will tell you what the powder is.

按下按鈕看粉末實驗結果

wax in the liquid

left hand palm

the back of left hand

right hand palm

the back of right hand

化學溶液對照表

**Color of the liquid means...**  
Red: blood  
Black: dirt (soft dirt)  
Blue: led (gunpowder)

liquid: 液體      special: 特別的  
powder: 粉末      wax: 蠟油  
blood: 血液      palm: 手掌  
dirt: 泥土      mean: 意思是  
gun: 槍  
led: 鉛 槍粉反應

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Figure 6.1. Scene 4: Findings

**Scene4: Gunpowder 補充說明**

What is Gunpowder?

當你開槍的時候,子彈往前射出,而Gunpowder會向後噴灑在持槍者的 **the back of the hand**. Gunpowder可以作為刑事案件的辦案線索.



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Figure 6.2. Scene 4: Gunpowder

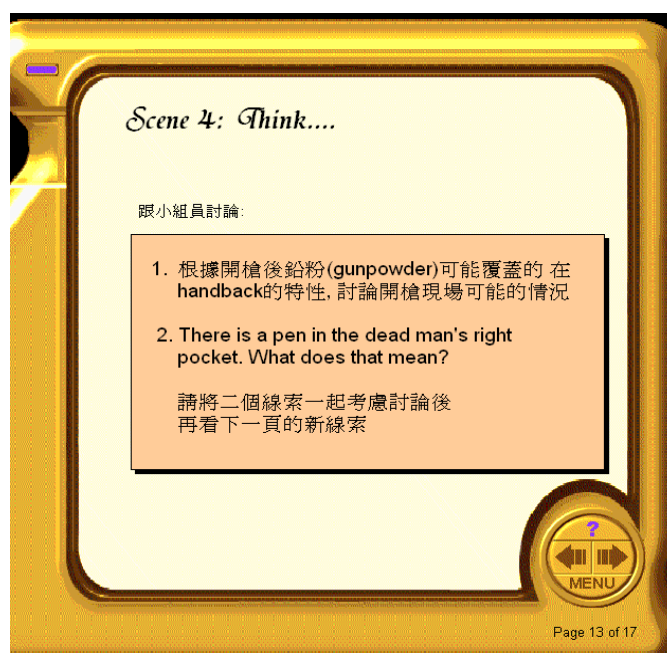


Figure 6.3. Scene 4: Think

In the third cycle, the gunpowder explanation screen was adapted and changed (Figure 6.2). The key clue “the back of the hand” was translated into English and then underlined and boldfaced to further make it stand out. The English expression corresponded with the English clue “the back of the left hand” in the previous screen of gunpowder experiment (Figure 6.1). This modification in the gunpowder explanation page was meant to guide the participants to refer back to the previous clue that the back of the dead man’s left hand had the gunpowder trace not his right. Besides this, the last page of Scene 4 (Figure 6.3), a reminder of “Please consider the two pieces of evidence (the gunpowder and the pen) before reading the new clues on next page was added. This reminder was meant to provide a meta-cognitive guide and help the participants discover the conflict of evidence.

In the third cycle, all three pairs clicked on the results of the gunpowder on the experiment page. When entering the gunpowder explanation page, Pair No. 7

discussed the spreading of gunpowder and found the conflict in the evidence of gunpowder on the left hand of the man and the pen found in the man's right pocket. They temporarily held the view that the man used his left hand to fire the gun. Pair No. 8 and No. 9 read the gunpowder explanation page and the guided thinking page. However, they did not discuss anything but instead just clicked on to the next scene.

It could be observed that only one pair (Pair No. 7) out of three was guided to do the discussion and found the conflict of evidence. The others only read what was presented on the screen without further discussion. In the second cycle, though most pairs did not generate a logical reasoning process, at least they tried to discuss what the clues might indicate. However, most pairs in the third cycle did much less discussion than pairs in the second cycle. The modification of the key clue and the adding of a reminder for discussion did not have the desired effect. Still, to judge that the modification is unworkable might be too quick, since the participants' drawback from discussion in the third cycle could not be possibly triggered by the modification. As discussed in the second cycle, the reason for the participants to skip the discussion might be that they were not used to solving problems through use of discussion.

### 6.7 Scene 5: Newspapers

In Scene 5, the participants were asked to comprehend the information in two pieces of news in order to (1) Correctly identify the dead man in Holmes's house was indeed the butler, and (2) Infer that Mr. Chen's son might have had a motive to kill his father.

In the first cycle, the participants failed to generate a logical reasoning process in Scene 5, due to the earlier obstacle encountered in the gunpowder experiment in



Scene 4. In the second cycle, Scene 4 was adjusted so that the participants were able to move forward to Scene 5. In Scene 5, most participants were observed to feel confused by the word “after” in the key sentence, “The butler ran away after he fired.” Also, most participants failed to make an accurate interpretation because they based their inference mainly on Newspaper 1, which was actually an erroneous report. Thus it is suggested to: (1) Change the difficult sentence pattern, “The butler ran away after he fired” in order to avoid misunderstanding, (2) Remind the participants of the possibility that information provided by Newspaper 1 might not be accurate, and (3) Organize all the clues from the previous scenes for the participants in order to help them synthesize information.

In the third cycle, the difficult sentence of “The butler ran away after he fired” was altered into “The butler fired and ran away” on Newspaper 1 (Figure 6.4). This was implemented to avoid the participants confusing the timing of the firing. Also, on the final decision-making page (Figure 6.5), an instruction in Chinese (L1) was added. It said, “Based on (1) Newspapers (Be careful, the first piece of news might not be accurate), (2) The spreading of gunpowder, and (3) The dead man’s outfit, discuss and decide the real killer with your partner.

Huan of Pair No. 7 read Newspaper 1, summarized the contents, and then said, “The butler is the killer.” Then after reading Newspaper 2, Huan changed her mind and said, “Mr. Chen’s son is the killer, because Mr. Chen had financial trouble. Also, the clue (on the discussion page) said that Newspaper 1 might not be accurate.” When they were asked about the gunpowder evidence, Jane (the other pair member) said that the evidence had no relationship in this case. Huan on the other hand said, “The powder is on the man’s palm, so the butler was not the killer.” As for Pair No. 8, Gan of this pair read out the newspaper and summarized in Chinese to his partner, Dan.

Then Gan concluded that the real killer was the son. He said, “The reason is that Newspaper 2 mentioned the fortune. Since it is impossible for the butler to inherit the fortune, Mr. Chen’s son is the best suspect. It might be that the butler found out the son’s intention and then the son wanted to kill the butler. Also, the butler has said that someone was going to kill him in the sound clip.” When they were asked about the evidence of gunpowder, Gan thought that the butler grasped Mr. Chen’s gun and fired when he was chased by Mr. Chen’s son. Besides, when asked about the evidence of the pen found in the right pocket, Gan said, “The butler should be left-handed, because the gunpowder spread onto his left hand.” As for Pair No. 9, they read the two pieces of news and thought that Mr. Chen’s son was the killer. Then they clicked to previous scenes to review all the evidence. Chen then explained to his partner the spreading of gunpowder; they imagined the man’s hands should pose in certain way. Then they concluded that Mr. Chen’s son wanted the money, so he tried



Figure 6.4. Scene 5: Newspaper 1



Figure 6.5. Task 6: Who is the killer?

to kill the butler. When they were asked about the evidence of the pen in the right pocket, they thought it did not have relationship in this case.

From the participants' reactions, it could be observed that the participants did not mention the timing of the butler's firing and his leaving. Thus, it could be inferred that the adjustments of the sentence "The butler fired and ran away" did not cause confusion. Besides, all three pairs concluded that the real killer was Mr. Chen's son. However, the main evidence they based their decision on was Newspaper 2. The three pairs firmly held the view that the financial problem Mr. Chen encountered (mentioned on Newspaper 2) was the motive for murder. Compared with previous cycles, the participants in the first two cycles based their conclusion mainly on Newspaper 1. This change from Newspaper 1 to Newspaper 2 might be due to the fact that participants were reminded on the final decision page that information provided in Newspaper 1 was not accurate. The reminder was originally meant to help the

participants not limit themselves to information provided in Newspaper 1; however, this reminder seemed to push the participants to believe the veridicality of Newspaper 2 without any second thought and then based their conclusion mainly on it. Although the participants' conclusions were correct, most of them did not consider any of the other evidence. That is to say, the adjusted instruction on the final page did not help the participants combine all the information. In order to understand the participants' thinking process, the researcher asked their opinions on the gunpowder evidence and the pen. Pair No. 7 and No. 9 did not make accurate interpretation on the two pieces of evidence. Some of the participants even thought that the two pieces were irrelevant. Pair No. 8 inferred that the butler was a left-hander and that he fired in self defense. Though Pair No. 8' inference did not match with the default answer, their reasoning process was still logical and acceptable. In short, only one pair out of three could generate a logical inference and identify the real killer. The modification of the instruction failed to facilitate the participants in the problem-solving task.

## 6.8 Discussion and Conclusion of the Third cycle

In the third cycle, the participants were invited to conduct the program which was adjusted according to suggestions generated from the second cycle. The participants' reactions were observed and compared with the previous two cycles. In this section, two issues are discussed: (1) written elements on the screen, and (2) a brief summary of the participants' reactions to the adjustments of the third cycle.

### 6.8.1 *Written Elements on the Screen*

To ponder why the adding of the clarification of the gunpowder experiment in

Scene 4 and on the final decision-making page of Task 6 still failed to stimulate the participants to discuss and to generate logical inferences, there are two possible explanations to be discussed. The first explanation discussed in Section 5.8 is that the participants had little experience in completing problem-solving tasks such as Task 6 in this study. Therefore, the adding of the instruction on the final decision-making page still failed to scaffold the participants generating a reasonable or logical inference. The other possible explanation generated from this cycle is that the written form of instruction, especially the long one like that in Task 6, does not help to guide the participants as how it was expected to be. Jewitt (2006) indicated that there is a tendency that the role of written language is de-centering when learners interact with multimodal computer-assisted learning programs on the screen (p.81). The instruction added in the third cycle originally was meant to provide opportunities of discussion; however, the participants did less discussion than in the previous cycles and ignored the written reminder. Jewitt's viewpoint and the participants' reactions suggest that the designer should consider the limit of written elements on the screen and provide other modes such as visual ones to reinforce or to replace the written forms of information.

#### *6.8.2 Summary of the Participants' Reactions to Adjustments in the Third Cycle*

In the third cycle, program adjustments included: (1) In Task 1, the speaking task, the 4 WH clues were presented in Chinese on the screen in order to trigger more responses, (2) In Scene 4, the gunpowder experiment, the key clue "the back of the hand" was presented in English and highlighted in order to catch the participants' eyes; also, a reminder to ask the participants to consider the clues of gunpowder and the pen was provided in order to help them make inferences, (3) In Scene 5, the newspaper scene, the sentence "The butler ran away after he fired" was altered into "The butler

fired and ran away” in order to avoid confusion, and (4) In Task 6, the final-decision page, a reminder was provided in order inform the participants that information on Newspaper 1 might not be accurate; also all the clues from the previous scenes were organized for the participants to correlate them before making their final decision.

The participants’ reaction towards these adjustments were: (1) In Task 1, the participants composed richer and more complete lines for the 4 WH clues which were presented in Chinese, (2) In Scene 4, only one pair out of three heeded the instruction; the other two pairs did less discussion than those in the second cycle, (3) In Scene 5, the altered sentence “The butler fired and ran away” did not cause confusion, and (4) In Task 6, the reminder of the veridicality of Newspaper 1 resulted in the participants believing Newspaper 2 was accurate. Also, the list of all the clues in the previous scenes did not function well.

From the participants’ reactions in the third cycle, it could be noticed that most of the design problems were solved through 3 cycles of implementation except those in Scene 4 and Task 6, which were problem-solving tasks. More research is necessary to completely explore this issue.