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Concept mapping as pre-task planning: A case study of three Japanese ESL writers

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Abstract

The majority of research to date on pre-task planning has investigated the impact of planning time on L2 learners’ oral production, and has generally reported its positive effects on their task performance. However, little research on planning has been conducted in writing contexts, and there is no firm evidence to demonstrate that pre-task planning promotes L2 learners’ written production in the ways that many researchers have reported for L2 speaking contexts. In this paper, I have explored whether and how concept mapping as a form of pre-task planning could benefit the writing performance of three Japanese ESL learners. I analysed four compositions from each of the learners, written with and without concept mapping; using measures of accuracy, complexity, fluency and [Hamp-Lyons, L., 1991. Reconstructing “Academic writing proficiency”. In: Hamp-Lyons, L. (Ed.), Assessing second language writing in academic contexts. Ablex, Norwood, NJ, pp. 127–153.] holistic measures of global quality, communicative quality, organisation, argumentation, linguistic accuracy, and linguistic appropriacy. I also examined through a questionnaire, retrospective interview, and logs, the learners’ applications of the strategy in their writing processes. Pre-task planning was associated positively with the overall measures of the learners’ written production during in-class compositions, with the exception of accuracy. Moreover, each learner made unique applications of the concept mapping strategy in their writing processes, suggesting that concept mapping may help ESL learners improve their composing but in ways unique to individual experience, motivation, and task conditions.
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1. Introduction

The effect of planning time on second language (L2) production has been investigated over the last few decades in various studies that have adopted an information processing approach, which claims that humans have limited cognitive capacity, and thus their focus of attention and information-processing ability are also restricted during task performance (Robinson, 2003; Skehan and Foster, 2001). Following this research paradigm, a number of studies have examined the effects of planning time on L2 learners’ language production and have explored the potential of pre-task planning. The underlying assumption of these studies is that pre-task planning may minimise L2 learners’ cognitive expenditure for processing information during task performance by allowing them to prepare in advance for a task, and consequently enhance the quality of their language production.

The majority of planning studies have been conducted in speaking contexts, measuring learners’ spoken language in terms of three aspects of linguistic performance: fluency, complexity and accuracy. The research to date has generally reported positive effects of pre-task planning on language production, especially for fluency and complexity; however, recent findings showed controversial results where accuracy was concerned (see Ortega, 1999). The different results from these studies, especially in accuracy, suggest that a number of factors (e.g., task type, planning condition, assessment measure, L2 proficiency) may influence the effects of planning time. Recently, Yuan and Ellis (2003) demonstrated the complex nature of pre-task planning research and pointed out the need for further investigation of various factors involved in the planning processes (see Ellis, 2003; for a summary of task design variables affecting learners’ language production).

Similar to the research in speaking contexts, the few planning studies in L2 writing contexts that have been conducted also employed different variables in terms of planning conditions, task types, and the aspects of L2 learners’ writing performances that were analysed (e.g., Kroll, 1990; Romstedt, 2000; Shi, 1998). Because the number of L2 pre-writing planning studies is limited, it is difficult to see common traits of planning effects on learners’ writing performance by comparing the results across studies. However, what can be said from the research to date is that advance planning time itself does not seem to have much effect on L2 learners’ output in writing. This is different from the research on speaking, which generally shows that learners’ oral production may improve by simply allowing them time to plan before speaking. Since writing processes can involve longer time for both pre-task and while-task planning than speaking processes, the effects of extra time for pre-task planning can easily blur in the sequence of time for composing. Learners in these studies may also have revised their produced text and corrected their mistakes while writing, and thus the effects of pre-task planning on accuracy may not be evident in their writing performance. These possible characteristics of writing signalled the need for an explicit strategy in a planning phase for writing. Accordingly, the present study attempted to explore how a planning phase prior to writing might affect L2 learners’ writing performance.

2. Concept mapping as a form of pre-task planning

The present study adopted concept mapping as an instructional strategy and examined its potential for improving ESL (English as a Second Language) learners’ written production. Concept mapping was first developed by Hanf (1971) as a model for
improving the teaching of study skills. It typically starts with students generating words relevant to the topic and sorting them into groups of associated words. Students then develop their ideas on the topic and draw organisational structures, which can either be linear or hierarchical. Concept mapping is based on the principles of schema theory, which presupposes that information is stored in the brain as abstract mental structures, categorical rules, or scripts that humans use to interpret the world (Schmidt, 1999). Therefore, instruction for concept mapping usually includes a brainstorming session where students are encouraged to activate their prior knowledge of a topic and focus on the relevant content schema (Carrell et al., 1989). The technique of concept mapping has been widely practiced and studied under different terms, such as semantic mapping (e.g., Cronin et al., 1992; Heimlich and Pittelman, 1986; Lipson, 1995; Schultz, 1991), cognitive mapping (e.g., Boyle, 1996; Peresich et al., 1990; Reynolds and Hart, 1990) and webbing (e.g., Brown and Salisch, 1996; Norton, 1993; Pieronek, 1994). The distinction between these terms is not clear in the literature, and they are likely to be used as equivalent in both L1 and L2 studies.

A major reason for selecting this strategy as a target instruction is that concept mapping is recognised to be effective for both conceptual and linguistic development (Heimlich and Pittelman, 1986) and is widely implemented in classroom instruction. A number of studies have reported the positive effects of concept mapping in a variety of instructional settings. For example, it has been used as a technique for increasing vocabulary (Harley et al., 1996; Johnson and Steele, 1996; Morin and Goebel, 2001), improving reading comprehension (Baumann and Bergeron, 1993; Carrell et al., 1989; Lipson, 1995; Tang, 1992) and writing skills (Cronin et al., 1992; Schultz, 1991), and facilitating the comprehension of concepts in subject areas (Parkes et al., 1999; Patterson, 2001; Roth, 1994). Concept mapping also helps students in special education programmes to promote their literacy knowledge (Boyle, 1996; Englert and Mariage, 1991; MacArthur, 1996; Sinatra et al., 1994).

In writing contexts, concept mapping has been said to facilitate the process of writing (Pieronek, 1994; Renner, 1992; Rey, 2000; Washington, 1988); however the extent of empirical research on mapping is limited, and most of the studies were done in L1 writing contexts. For example, Cronin et al. (1992) reported the progress of a district plan for secondary schools in Mississippi, demonstrating that mapping strategies had promoted students’ understanding of text organisation and writing processes based on the results of writing tests over a four-year period. Reynolds and Hart (1990) provided three instructional conditions (i.e., concept mapping, brainstorming and outlining) to fourth graders and compared the efficacy of each strategy technique in the revising stage of writing. The gain scores of revised essays from the mapping group were significantly higher than they were for either the brainstorming or outlining groups.

As far as I know, there is only one study that reported the effects of mapping strategy on L2 writing. Schultz (1991) implemented the semantic mapping strategy in a second-year French university programme in California, investigating the instructional effects on students’ writing performance over a year. In the first semester, instructors introduced semantic mapping as a pre-writing activity. The process initiated from class discussion, where students generated ideas on a selected theme and made connections between the idea clusters. After the brainstorming activity, students formulated a theoretical generalisation, a thesis statement, or a group essay. At the end of the lesson, instructors addressed the benefits of the mapping strategy and encouraged students to utilise it when writing. The mapping strategy was used intermittently throughout the second-year French class. The
instructors reported improvement in students’ writing ability, willingness to participate in discussion, and satisfaction with their work on the course.

Schultz (1991) study implies the potential of mapping strategies as an effective pre-writing activity to enhance students’ writing performance. In this second-year French programme, semantic mapping was combined with group or general class discussion, in which students tried out and refined their ideas with their peers for writing. Schultz points out that the combination of mapping strategies with oral activities could promote students’ “higher-level thinking” (p. 986), whilst developing their organisational skills for writing. Considering a variety of interpretations and applications of concept mapping in actual classroom contexts, I use the word ‘concept mapping’ in a broad sense in the present study. In terms of its shapes and structures, concept maps may include a description of associated word clusters with no explicit organisational structures. In terms of its application, concept mapping may be combined with other brainstorming activities such as discussion, and I consider this whole connected process as the concept mapping strategy in a form of pre-writing activity. Since the main purpose of adopting the concept mapping strategy in this study was to provide an explicit approach to planning, I accepted a loose definition of this strategy to meet a real classroom situation.

3. Purpose of the study

The research reported here examined the effects of pre-task planning on ESL learners’ writing performance. I adopted a case study approach for this investigation because both individual and contextual factors, such as students’ backgrounds, their previous experience of using pre-task planning strategies and a task environment, could contribute to learners’ composing processes and products. I also conducted this study in a natural classroom context, considering the demand of writing tasks and the crucial role of concept-mapping instruction in this research project. The questions that guided this study were as follows:

1. To what extent does pre-task planning in the form of concept mapping affect adult Japanese-background ESL learners’ writing performance?
2. How do adult Japanese-background ESL learners utilise the pre-task planning activity of concept mapping in their actual writing processes?

4. Methods

4.1. Context

The present study was conducted in the writing skills programme at a private ESL school in Toronto, Canada. The programme was one of the electives offered in the school, and students in the intermediate or above levels (i.e., TOEIC$^1$ 500 or above) were eligible to take this writing course. The programme focused on paragraph writing, comprising the instruction of vocabulary, grammar and compositions. The programme session lasted for

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$^1$ Test of English for international communication.
four weeks, and the class met twice a week for 140 min a day. The instructor of the course, Karen (a pseudonym), was using concept mapping as a pre-writing activity, and this initiated my approach to her writing class as a possible site for this research project. Karen provided concept mapping instruction to activate students’ prior knowledge related to a topic, and preferred to apply this planning strategy with a group activity (e.g., group discussion) so that students could take new information from their peers and expand their ideas for writing. In Karen’s class, concept mapping was introduced in the third week of the programme session, and was used through the last two weeks as a pre-writing activity for both in-class and homework compositions. For ethical reasons, I requested neither additional instruction nor modification of her usual teaching practices.

4.2. Participants

Three adult Japanese ESL students (who I refer to using pseudonyms) in the writing skills programme participated in this study. I focused on Japanese ESL learners so that possible influences of diverse L1s were avoided in the study (see Carson, 1992; Hinds, 1990; Kroll, 1990). More importantly, it was advantageous to limit the participants to such as had my own L1 background, so that the process of data collection, especially interviews, could be conducted in the first language of the participants. In the summer of 2003, when I collected data for this study, SARS (Severe Acute Respiratory Syndrome) broke out, and this situation seriously affected the number of students coming to study at ESL schools in Toronto. When I visited Karen’s writing class to recruit participants for this study, there were only three Japanese students studying in the writing programme, and they all agreed to participate in this research project.

Chie is a 22-year-old college student majoring in general politics at a Japanese university. At the time of this research, she had taken leave from the university to study English in Canada for a year. When I asked her reasons for studying in Canada, she expressed her urgent need to improve her English language proficiency, especially her academic English writing skills. The department of general politics where she was enrolled in Japan had recently been established in the university, and approximately half of the third and fourth-year classes are required to adopt English as a medium of instruction. Due to the high demand for English language skills, academic English language courses are provided for the first and second-year students in the university. Chie had taken these English language courses in the first two years and practised academic English writing along with other English language skills (i.e., listening, reading, speaking, pronunciation). In the English writing class in Japan, she had learned concept mapping and wrote several essays by drawing concept maps as a brainstorming activity. Chie’s TOEIC score at the time of collecting data for this study was 725.

Miho is a 23-year-old university graduate who completed her undergraduate degree in English language and literature in Japan. After having graduated from university, she went to Canada to seek opportunities for studying in a graduate programme. While she was at university, she had travelled to England and Australia in consecutive years and had stayed in each country for a month to study English. She went to an ESL school in England, where she learned concept mapping for the first time. A month before my research, she was re-exposed to concept mapping instruction in the Test of English as a Foreign Language (TOEFL) class in Toronto, and wrote two compositions using this strategy. Miho had the highest TOEIC score (790) of the three learner participants in this study.
Yuri is a 31-year-old university graduate who had completed her undergraduate degree in information technology in Japan. She had worked for a Japanese company for six years before she left her job to go to Canada. When I asked her the reason for studying in Canada, she said that she was “worn-out” after repeating the same routine work in her office for several years: “I wanted to realise my dream to live in a foreign country” (Yuri, Interview). Yuri studied English only for the first two years in the university as a part of a liberal studies programme. Since she did not have any opportunities to study English after that, it was eight years before she began to study at the ESL school in Canada. She had no previous experience of learning concept mapping before taking Karen’s writing class. Yuri’s TOEIC score (660) was the lowest of the three participants.

4.3. Data collection

At the early stage of the research process, each of the participants completed a questionnaire that asked about their prior ESL/EFL studies, their experience of learning or using concept mapping for compositions, as well as their planning strategies for English and Japanese writing. The results from this questionnaire provided information about learner variables, which helped me to consider possible effects of these individual factors on each student’s writing performance.

During a period of the writing course, I observed Karen’s class and took field notes regarding the process and the content of mapping instruction as well as the students’ performance in the class. To examine the effects of planning on learners’ written texts, I collected two pre-planned and two non-pre-planned compositions from each learner participant. Since previous planning research in speaking contexts compared learners’ pre-planned and non-pre-planned utterances, I also examined the students’ compositions written under these two planning conditions in order to see any similar or different traits of planning effects on their writing performance. Karen used multiple drafts in her instruction, and the students conducted revisions after having received her written feedback on their draft compositions. Considering the possible influence that this revising process might have on the students’ textual features, such as accuracy, I focused my analysis on their first drafts of each writing task.

The first compositions were written on the first day of the course, before Karen introduced the pre-writing strategy of concept mapping to the class. The students were instructed to write as much as possible within 15 min about their favourite movies without doing any planning in advance of writing. The second compositions were written individually at home as an assignment for the second class. The students chose their own topics for this writing assignment. Chie, Miho and Yuri reported that they had spent approximately 15–30 min to complete this assignment.

The third compositions were written in the third week of the class session after Karen had introduced the concept mapping strategy in her class. For this writing exercise, she provided five topics and told the students to choose one of these for their own writing. In order to describe concept mapping, Karen chose the topic “watch” as an example and wrote the word on the blackboard. She explained to the students that they would choose their own topic first, write it in the centre circle of the map, and then expand their ideas on the topic. As subsequent ideas of “watch,” Karen wrote the words “fashion” and “be on time” on the blackboard and drew lines to connect these subsequent words with the topic. She added a few more idea sequences to the map, demonstrating how to develop
ideas on the topic. After Karen’s explanation about concept mapping, the students drew concept maps individually in their notebooks, and then worked in groups to share their ideas for writing. Ten minutes were allotted for each brainstorming activity. After the group discussion, the students wrote their compositions individually within the allotted 20 min.

The fourth compositions were written in the last week of the class session. In this writing practice, the students were first divided into groups to work on a pre-writing activity. Each group chose a free topic for writing and drew a concept map on a large sheet of paper. After making a map, each group showed their map to the class and explained their ideas about the topic. The students were then assigned to write a composition at home based on this group brainstorming activity. Chie, Miho and Yuri’s self-reported time for this assignment was approximately 15–30 min.

Along with the compositions, I collected the concept maps that the students drew for writing their third and fourth compositions to examine how the students used the concept maps in their actual writing processes. To investigate this procedure from the learners’ perspectives, I also asked Chie, Miho and Yuri to write their logs in their first language, Japanese, after they had received the concept mapping instruction and had written compositions. The log sheet consisted of two types of questions, asking the learners how they utilised the pre-writing activity in their writing processes and enquiring into their perceptions of the concept mapping strategy.

After the whole class session was completed, I administered a semi-structured interview to each participant. The main questions of the interview concerned: (1) how they actually utilised the concept mapping strategy while writing; (2) whether they found any benefit from using the concept map, and if they did, what kind of benefit they found, and (3) whether they had trouble in using the concept map, and if they did, what kind of problems they encountered. I also asked about their prior experience of concept mapping, as well as their planning strategies for writing in both English and Japanese. The interviews were administered individually in Japanese by referring to the compositions, concept maps, logs and questionnaire that the students had completed in advance.

4.4. Data analysis

Three sets of data were analysed to see the possible effects of concept mapping on the learners’ written product as well as their writing processes: (1) composition data; (2) verbal reports (i.e., retrospective interview, logs), and (3) descriptive data (i.e., questionnaire responses from the learners, concept maps).

4.4.1. Text analyses

I used two different sets of measures for the analysis of the composition data, thereby considering the possible influence of assessment tools on the outcomes (Carrell and Monroe, 1993). In the first part of the analysis, I used Hamp-Lyons’ holistic measures (1991), which assessed the qualities of the learners’ compositions. These measures consist of global and profile scales, which cover various aspects of writing performance (i.e., global quality,
communicative quality, organisation, argumentation, linguistic accuracy, linguistic appropriacy). In this phase of analysis, two ESL professionals rated the learners’ compositions using both global and profile scales of Hamp-Lyons’ holistic measures. Prior to the analysis, I provided the raters with a training session in order to re-familiarise them with the instrument. The scores for each composition were averaged when they differed between the raters. The internal consistency of the first part of the analysis was 0.78 (Cronbach’s $\alpha$).

In the second part of the analysis, I assessed the compositions in terms of accuracy, complexity and fluency (see Table 3) following Polio (1997) guidelines and previous pre-task planning research in speaking contexts. For the calculation of a type-token ratio, I followed the procedures in Engber’s (1995) study. This analytic measure was chosen in order to show variation of lexical items (i.e., nouns, adjectives, full verbs and adverbs) in the students’ compositions. To minimise the possible influence of text length on the type-token measures, each composition was divided into 88-word segments ($\pm 5$ words), and I calculated the average of the type-token ratio for each segment in a composition. In this phase of the analysis, approximately 25% of the data were randomly selected and then were reassessed by another researcher. The interrater consistency was 1.0 (Pearson’s $r$).

4.4.2. Process analyses

Two kinds of verbal reporting methods, retrospective interviews and logs, were used to examine the learners’ utilisation of the concept mapping strategy in their writing processes. First, I coded the interview data and logs using a coding scheme that I had developed on the basis of the research questions. The scheme, therefore, draws on the conceptions of the process approach, which considers human cognition as a fundamental component of writing processes (e.g., Emig, 1971; Hayes and Flower, 1980; Hayes and Nash, 1996). The coding scheme consisted of five categories, which investigated:

- the learners’ background of English study,
- their previous experience of planning strategies for writing,
- their understanding of the concept mapping instruction in Karen’s class,
- the ways they drew their concept maps and applied them to their writing processes, and
- their perceptions of the concept mapping strategy.

I also examined the learners’ questionnaires using the same coding scheme. Then I compared the concept maps that the learners drew to plan their writing with their respective compositions in order to investigate how the learners used the concept maps in their actual writing processes. I highlighted the words or sentences that appeared both in the concept maps and in the compositions, and then examined their positions in the structure of the planned compositions.

5. Results

5.1. Results of text analyses

The learners’ individual scores of the composition ratings for Hamp-Lyons’ (1991) measures are shown in Table 1. To compare each of the learners’ pre-planned and non-pre-planned compositions written in the in-class and homework situations respectively,
I calculated the differences between the compositions. As Table 2 shows, Chie and Miho’s scores in composition 3 were better than those in composition 1 in all rating categories, whilst Yuri’s scores in those in-class compositions showed no obvious differences. The degree of differences in the in-class compositions varied among the rating categories, as well as among the learners. For example, the organisation scores of the pre-planned compositions were considerably better than those of the non-pre-planned compositions in both Chie (3.0) and Miho’s (2.0) cases; however, those in the linguistic accuracy measures showed relatively small differences among the six rating categories. In the homework situations, all the learners’ scores showed only minor or no differences between the pre-planned and non-pre-planned compositions across the rating categories.

Table 3 shows the composition ratings in the accuracy, complexity and fluency measures. As Table 4 indicates, the differences in scores between the compositions written with and without the pre-task planning activities showed distinct tendencies in the measures used in this phase of analysis. All the complexity measures, for example, showed the students’ better performance in both in-class and homework compositions when they drew concept maps to plan their writing. Among the three learners, Miho performed the best in the overall complexity measures in both in-class and homework situations. In terms of fluency, all the learners performed better in the pre-planned than non-pre-planned compositions when they wrote in class. Moreover, a similar tendency was observed in Chie and

Table 1
Composition ratings in Hamp-Lyons’ measures

|       | Chie  | Miho  | Yuri  |
|-------|-------|-------|-------|
|       | C1    | C2    | C3    | C4    | C1    | C2    | C3    | C4    | C1    | C2    | C3    | C4    |
| Global| 5.5   | 6.5   | 8.0   | 6.0   | 5.5   | 5.0   | 6.0   | 5.0   | 6.5   | 6.0   | 6.0   | 6.5   |
| Comm. | 5.5   | 7.0   | 8.0   | 6.5   | 5.5   | 5.5   | 6.5   | 4.5   | 6.0   | 6.5   | 6.0   | 6.5   |
| Org.  | 5.0   | 6.5   | 8.0   | 7.0   | 4.5   | 5.0   | 6.5   | 4.0   | 6.0   | 6.5   | 6.0   | 6.0   |
| Arg.  | 5.5   | 7.0   | 7.5   | 7.0   | 5.5   | 5.0   | 6.0   | 4.5   | 5.5   | 6.5   | 6.0   | 6.0   |
| Lg. ac. | 5.0 | 6.0   | 7.0   | 6.0   | 5.5   | 6.0   | 6.0   | 5.5   | 6.0   | 6.0   | 6.0   | 6.5   |
| Lg. app. | 5.0 | 6.0   | 7.0   | 6.0   | 5.5   | 5.5   | 6.5   | 5.5   | 6.0   | 6.0   | 6.5   | 6.0   |

Note: Judgments were made on 9-point scales.
C1 = no pre-task planning, in-class composition.
C2 = no pre-task planning, homework composition.
C3 = +pre-task planning, in-class composition.
C4 = +pre-task planning, homework composition.

Table 2
Differences in the composition ratings between no pre-task and +pre-task planning conditions: Hamp-Lyons’ measures

|       | C3–C1 | C4–C2 |
|-------|-------|-------|
|       | Chie  | Miho  | Yuri  | Chie  | Miho  | Yuri  |
| Global| 2.5   | 0.5   | −0.5  | −0.5  | 0.0   | 0.5   |
| Comm. | 2.5   | 1.0   | 0.0   | −0.5  | −1.0  | 0.0   |
| Org.  | 3.0   | 2.0   | 0.0   | 0.5   | −1.0  | −0.5  |
| Arg.  | 2.0   | 0.5   | 1.0   | 0.0   | −0.5  | −0.5  |
| Lg. ac.| 2.0  | 0.5   | 0.0   | 0.0   | −0.5  | 0.5   |
| Lg. app.| 2.0 | 1.0   | 0.5   | 0.0   | 0.0   | 0.5   |

a C3–C1 = the raw score of composition 3 minus the raw score of composition 1.
b C4–C2 = the raw score of composition 4 minus the raw score of composition 2.
Miho’s homework compositions, but not in Yuri’s. Chie especially wrote longer compositions using a greater variety of words when she pre-planned and composed in class. The overall accuracy measures showed no clear differences between the pre-planned and non-pre-planned compositions in either in-class or homework situations. Chie produced more grammatical error-free clauses when she pre-planned for composing in class, but this tendency did not appear in the homework situations. Miho’s accuracy scores in the pre-planned compositions were even lower than those in the non-pre-planned compositions.
Yuri performed slightly better in the pre-planned scores of lexical error-free clause, but no obvious differences were observed in the other accuracy measures.

5.2. Results of process analyses

5.2.1. Features of the learners’ concept mapping

The combinations of three learners’ interview responses and their description in the logs revealed that they understood Karen’s instruction of concept mapping in a similar way; that is, they described concept mapping as a way to generate and clarify their ideas for compositions by writing down words related to the topic and connecting them in a tree-like structure. However, their ways of drawing a map involved distinct individual interpretations and features. For example, Chie seemed to employ concept mapping as a holistic brainstorming activity and drew her maps like a web, which spread by connecting a cluster of words (see Fig. 1). She described this strategy as an association game and jotted down the ideas that flowed out from the given topic. Miho’s concept maps, on the other hand, showed a structure that represented the organisation of her completed compositions (see Figs. 2 and 3). She stated in the interview that her compositions often consisted of a topic sentence, a few examples related to the topic and a conclusion, and that she included these components in her concept maps. This indicates that Miho employed concept mapping as a draft of her composition rather than as a simple brainstorming activity, which characterised Chie’s use of this strategy.

Yuri, who had no prior experience of concept mapping, failed to draw a map, and listed several sentences instead to prepare for writing (see Fig. 4). Main ideas or connections between the sentences were not indicated in her list. Yuri wrote in her logs that she just listed as many sentences as possible that came into her mind, but she also stated in the interview that she listed sentences in the same order, as they would appear in her composition. Since she actually applied most of the sentences in the list to her composition in the same sequence as she had listed them initially, it is apparent that she employed listing as a draft for sequencing her writing rather than as a mere brainstorming activity to conceptu-

Fig. 1. Chie’s concept map for composition 3. Note. Because of the poor quality of the original map, I have rewritten the text verbatim.
alise ideas. Her list, however, did not show the structural patterns which were observed in Miho’s concept maps.

5.2.2. Applications of concept mapping

As observed above in their ways of drawing concept maps, each participant also showed unique applications of concept maps in their writing processes. For example, Chie, who simply wrote a flow of associated words on her map, selected a few ideas from the
map and adopted them as key elements in her composition, whereas Miho used her map as a draft of her composition and applied most of the ideas in the map to her writing processes. In the map for composition 3, Chie wrote 43 ideas, mostly as single words; however, she chose only five to use in her composition. Meanwhile, Miho wrote a topic sentence from the main idea in her map and used 10 out of 11 subsequent ideas in the body of her composition.

In Chie’s case, a concept map seems to have worked as a catalyst; a few selected ideas from the map later inspired her to create sentences. Chie stated in the interview that she made a rough structure of the composition in her mind on the basis of these selected ideas, but did not refer to her map while writing. This also suggests that she utilised a few ideas in the map as a spark to develop her composition but did not depend on the map for her whole writing processes. Miho, on the other hand, reported that she needed to consult her map closely while writing. Since she projected a whole image of a composition in her map, she used it as a draft and applied its elements to her writing processes. As I mentioned in the previous section, Miho followed a simple organisational pattern, which consisted of a topic sentence, a few examples and a conclusion, when composing. In Miho’s case, this structural schema seems to have provided a solid framework that facilitated applying elements in a map to her writing processes. This application of concept mapping differed considerably from Chie’s, where it served as a catalyst that invoked new ideas for writing.

Yuri, moreover, had trouble drawing a concept map in the first place. For composition 3, she listed several sentences instead of making a map. The only concept map that she ever drew in Karen’s writing class was the one produced in a group for composition 4; however, she incorporated only two words from this group concept mapping into her composition. One of the two words was the topic for writing, which appeared in the centre of the map. No other evidence was observed regarding her application of concept mapping in her writing processes. When comparing Yuri’s list of sentences with her composition 3, I surmised that she made the list as a draft of her composition. Unlike Miho, however, Yuri wrote complete sentences at the planning stage and directly applied them to her composition without changing any wording. Since these sentences covered only one of the two episodes presented in her composition, her list appeared to be an unfinished draft. It is assumed that the second episode and a conclusion were produced as she proceeded with her writing. This imbalance in drafting and its direct application to her composition characterise Yuri’s planning and writing processes.

5.2.3. Attitudes towards concept mapping

The investigation of the three learners’ attitudes towards concept mapping revealed several advantages and disadvantages in the application of this strategy to their writing processes. Chie, for example, expressed favourable comments overall towards the use of concept mapping in her compositions, pointing out the benefit of visualising ideas on a piece of paper. She said that concept mapping helped her generate ideas for writing; however, she also mentioned her problems in selecting and focusing on a specific idea in the map. In order to avoid this confusion, Chie sometimes skipped drawing a concept map, especially when a writing question was provided.

I make a concept map only when I cannot come up with good ideas [for writing]. When I write an essay [for class assignment in the university], [a problem] is usually provided. In this case, I just do some research [on the problem] and I don’t usually
use [a concept map]. But when I’m told to write something original, I often use [a concept map]. (Chie, interview)

This comment shows that Chie judged her need for using concept mapping based on the nature of the writing task. That is, when a task required creativity or quickly generating original ideas, she applied the strategy in order to specify her writing topic through brainstorming. Chie’s comment on the usefulness of concept mapping might be perplexing, considering her interest in developing academic writing skills. Since Chie’s application of concept mapping focused on holistic brainstorming, her awareness of utilising this strategy seemed restricted to writing tasks that required ‘creativity,’ which may not be a typical construct for academic writing.

Miho also showed a favourable attitude towards the use of concept mapping in her writing processes, and stressed its positive function as an organiser of ideas. Unlike Chie, she found this strategy useful for academic writing such as writing essays for the TOEFL exams, and pointed out the advantage of describing ideas in a diagram for structuring paragraphs. In the interview, she expressed anxiety about writing compositions without making concept maps.

[When I write without a concept map,] I don’t feel confident (.) after I’ve finished writing. [While writing,] I feel like I’m not sure how to conclude [my composition]. Even after I’ve finished writing, I’m not sure if I’m clear in my writing. When I use a map, I can check like, yes, I’ve written examples, and I’ve written a conclusion. So I can feel all right. (Miho, interview)

Although Miho incorporated the concept mapping strategy into her writing processes and even showed a certain dependence on it, she mentioned that she sometimes needed to skip this planning process due to time restrictions. In Miho’s case, drawing a concept map seems to have required extra time for writing, which restricted her application of this strategy to her actual writing processes.

Yuri, too, recognised the benefits of concept mapping for her writing practices, although she was not able to use it when she first tried it in Karen’s writing class. Yuri understood the function of concept mapping and its potential to improve her writing processes, but she had trouble changing her writing patterns to accommodate the strategy. Her comments showed her conflicting orientations towards the mapping strategy.

I usually make a plan for writing in my mind. Then I just write off, just write down the ideas in my mind. But in this way, I often forget [what I’ve planned] while writing. If I use a concept map, I won’t leave out my ideas, so I think it’s useful. But I’m used to my own way, so I can’t, can’t change it. (Yuri, interview)

Yuri pointed out her insufficient experience in using this strategy as the reason for not using concept mapping in her writing processes. In the interview, Chie and Miho also said that they had struggled to adopt concept mapping to their writing processes at the initial exposure to the strategy. Chie stressed that she had finally learned how to comfortably use this strategy after a year of practice, whilst Miho said that she had come to feel comfortable with concept mapping just recently although she had first learned this strategy about three years ago. This may suggest that ESL learners need a certain period of practice in order to utilise the concept mapping strategy effectively in their writing processes (see Cronin et al., 1992; Schultz, 1991).
In turn, Yuri also expressed her uncertain feelings towards the need for using this strategy in her writing practices. She especially pointed out the simple level of her current writing tasks, and indicated that she thought she was capable of coping with these tasks without drawing a concept map. Besides the simplicity of writing structures, Yuri also mentioned that her approach to planning catered to the discourse types in her writing assignments.

I can just make a plan in my mind. The content of writing is something that actually happened around me. It’s not like an argument, so it’s easy to write. If I need to write an argument, I would use a concept map, [because] I can’t write without making a draft. (Yuri, interview)

Yuri’s comment like those of her two classmates indicates that the nature of writing tasks (e.g., their length, complexity, discourse types) may affect learners’ decision-making in using or not using the concept mapping strategy as well as the ways they may use it.

6. Discussion

6.1. Summary of findings

The present study investigated the impact of concept mapping as a pre-task activity on ESL learners’ written product as well as on their writing processes. The text analyses showed that pre-task planning related to the learners producing better written texts in their classes in terms of complexity and fluency; however, this tendency was not observed in the measures of accuracy. Chie and Miho’s overall scores of the Hamp-Lyons’ measures were also higher when they drew concept maps for composing in class, whilst Yuri’s holistic scores showed no obvious differences between the pre-planned and non-pre-planned compositions. No clear tendency regarding the effects of pre-task planning appeared in the learners’ homework compositions. A close observation of the individual learners’ composition scores in relation to their qualitative data implied a possible connection as to how the learners’ distinct applications of the concept mapping strategy might appear in the features of their compositions. For example, Chie and Miho, who had learned concept mapping before participating in Karen’s class, showed good manipulation of this strategy in their writing processes, and this appeared related to their better performance in the pre-planned compositions. Chie especially expressed her familiarity with concept mapping and stated that this strategy “is suitable to my [learning] style” (Chie, interview). Interestingly, it was observed that she performed considerably better in the overall scores of the pre-planned, in-class compositions. Miho, who was seeking opportunities for studying in a graduate school in Canada and was preparing for TOEFL, especially emphasised the function of concept mapping as an organiser of thoughts and applied her ideas to a certain rhetorical pattern (i.e., topic sentence, examples, conclusion) in her map. This application of concept mapping could be related to her high scores on the organisation and complexity measures when she composed in class after planning. In contrast, Yuri failed to draw a map when she was first instructed to do so, and her composition scores, except for the fluency measures, showed no better performance in the pre-planned, in-class situations. The learners in the present study also pointed out negative aspects of the concept mapping strategy, such as requiring extra time and trouble in drawing a map and selecting
specific ideas from it. Their comments indicated that these disadvantages could hinder their use of this strategy in their actual writing processes. Moreover, the learners’ decision-making in using or not using concept mapping seemed to be affected by various factors such as their familiarity with the strategy, the nature of writing tasks (e.g., length, complexity, discourse types) and situational restrictions (e.g., time limits). This suggests the complex interactions of variables in the process of L2 writing (see Cumming and Riazi, 2000).

Ellis (2003) recently identified major traits in the effects of planning on L2 learners’ speech production by reviewing empirical studies in the field of planning research. In respect to strategic planning, which I have called pre-task planning in the present study, Ellis (2003) (p. 136) acknowledged the following features:

- Strategic planning has a profound effect on fluency – the more time available for planning (up to a point, say, ten minutes), the more fluent the production.
- Where strategic planning does have an effect on accuracy this may be limited to rule-based grammatical features such as regular past tense.
- Strategic planning has a strong effect on complexity, particularly if there is sufficient time available (ten minutes) and guidance in how to plan is provided.
- There is also some evidence to suggest that individual learner planning or teacher-led planning is more effective than group-based planning.

It is interesting that, despite the different nature of speech and writing, these traits of strategic planning in speaking contexts were also observed in the results of the present study. For example, the present study showed that 10 min of planning time had positive effects on the fluency and complexity but not on the accuracy of the learners’ written production. This suggests that 10 min for planning was sufficient to favour the fluency as well as the complexity of written production. Considering that Chie and Miho in this study actually used their concept maps in their writing processes as they were instructed, the importance of providing guidance in planning should also be acknowledged in writing contexts. Yuri’s case, however, signalled that learners may need practice to familiarise themselves with a particular planning strategy. Regarding the efficacy of individual and group planning, the results of the present study also imply that individual planning might have been more effectively applied to the learners’ composing processes than group planning. The difference in efficacy between individual and group planning could be related to the nature of planning activities. Pre-task activities such as concept mapping or drafting, which can be directly connected to learners’ written production at conceptual and textual levels, may function more effectively when engaged in individually. The issues discussed above, however, require further investigation because of the possible limitations of the present study, such as the lack of statistical power due to the small sample size and the possibility of extra variables involved in the task conditions in a natural classroom setting.

6.2. Pedagogical implications

The main pedagogical implication of this study is the affirmation that pre-task planning activities may effectively promote the quality of written language production in ESL classes. Considering the findings of this study as well as those of previous planning
research, it seems to be a viable option for teachers to provide learners with explicit instruction on how to make a plan rather than simply allow them extra time for planning. In this way, learners can make the most of their planning time to prepare for writing. When adopting a strategic device such as concept mapping, teachers may need to set up a training period of a certain length to familiarise their students with the specific strategy. As Yuri’s case in this study has indicated, learners are likely to struggle to incorporate a new strategy into their own learning styles or practices at the first encounter. Teachers need to be aware of their students’ prior experience in using the strategy and to provide appropriate support according to students’ levels of familiarity with the strategy.

The present study also suggests that teachers could usefully observe learners’ planning and writing processes as well as their written production. In this study, Chie, Miho and Yuri displayed unique ways of engaging in the planning activities even though they had received the same instruction on concept mapping in class. Distinct functions of concept mapping were highlighted in their use of this strategy, which affected their writing processes as well as their produced texts. This indicates that teachers should not simply evaluate the learners’ written production but also monitor how learners actually use a specific planning activity in their writing processes. In so doing, teachers can see the efficacy of planning activity for their students and provide them with either supplemental or alternative activities.

Teachers may also need to consider the nature of writing tasks when adopting a specific planning activity. The present study found that the learners’ decision making process in using the planning strategy was affected by various factors in writing tasks, such as length, complexity and discourse types. That is, learners’ sense of the benefit that they expect to receive from the planning activity seems to vary according to the kind of tasks they perform. This sense of benefit from a planning activity is important in that it may affect learners’ motivation to engage in writing tasks.

6.3. Suggestions for future research

Since this was an initial endeavour to explore the field of planning research in L2 writing contexts, future studies could examine the planning effects on writing by using larger samples, different L1 groups and L2 proficiency levels, and a variety of planning activities and writing tasks. By so doing, possible relations between pre-task planning and these learner or task variables could be verified. Understanding these interactional effects on learners’ writing performance would further clarify the effects of planning on L2 writing practices. The present study investigated the effect of concept mapping on the students’ first drafting processes. The potential of concept mapping could further be explored through a longer sequence of writing practice, which may involve a role of concept mapping in feedback-revision processes.

One of the challenges for future research into planning is to investigate the longitudinal effects of planning on learners’ language production and to demonstrate the relation between planning effects and learners’ writing development. Previous research examined the effects of planning on learners’ language use, but not on their language acquisition (Ellis, 2003). Considering possible benefits for L2 pedagogy, it seems crucial to further the investigation of planning effects on acquisitional levels. Swain (1995) (pp. 126–127) explained the role of language production in learning as follows:
The importance to learning of output could be that output pushes learners to process language more deeply (with more mental effort) than does input. With output, the learner is in control. By focusing on output we may be focusing on ways in which learners can play more active, responsible roles in their learning. In speaking or writing, learners can ‘stretch’ their interlanguage to meet communicative goals. They might work towards solving their linguistic limitations by using their own internalised knowledge, or by cueing themselves to listen for a solution in future input.

If, as Swain (1995) has claimed, learners’ language production can induce deep levels of language processing and extend their interlanguage (Selinker, 1972) beyond the current levels, their better language production sparked by pre-task planning may extend their interlanguage even further. This inspires an empirical question whether or not pre-task planning has the potential to accelerate L2 learners’ language development.

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