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Tertiary level EFL college students’ opinion toward computer-based concept mapping in English writing

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Abstract

This study investigated tertiary level EFL university students’ attitudes toward computer based concept mappings in a six-week writing program. Based on the pretest and posttest design, twenty freshmen constructed their computer-based concept maps collaboratively. The 24-item instrument was revised from Lee’s questionnaire (2010), in which the participants’ attitudes, the perceived usefulness of computer-based concept mapping were investigated, and their opinions toward collaborative concept mapping were collected on a five-point scale. Results showed that students did not have any significant attitude change toward concept mapping. However, higher rating of their perceptions toward the usefulness of computer-based concept mapping, and toward collaborative construction of concept mapping was found.

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1. Introduction

Computer concept mapping, based on the theory of constructivists, who proposed that learning environments were most effective when learners were actively involved in constructing their own meaning and doing so within authentic learning environment (Brown, Collins & Duguid, 1989) where concept mapping supported the construction of knowledge via analysis, inferences from texts through elaboration with prior knowledge (Pearson & Johnson, 1978) and synthesis (De Simone & Schmid, 1998). It was a widely used instructional and pre-writing tool, which helped teachers and students visually represented their knowledge and depicted relationships among concepts. Concept mapping also allowed the learners to abstract information, related ideas, and represented them by enclosing the concepts in nodes and attached by links. It also improved ESL and EFL students’ writing by helping them

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generate better compositions, richer contents, and better organizations across different proficiency levels (Conklin, 2007; Lee, 2010; Lee, 2013; Liu, 2011; Ojima, 2006; Zaid, 2011).

Based on the theory of scaffolding of Vygotsky (1978), the studies of collaborative learning have been the focus of recent research. In collaborative learning, students constructed their cognitive structures by representing concepts and their ideas socially (Stoyanova & Kommers, 2002).

The separate benefits of collaborative learning and concept mapping suggested that the combination of these two approaches were effective in improving learners’ knowledge construction (Carnot, Feltovich, Hoffman, Feltovich & Novak, 2003; Stoyanova & Kommers, 2002), lectures listening (Czerniak & Haney, 1998), and text readings (Amer, 1994). Possible explanations may be related to that fact by collaboratively constructing a concept map, students needed to discuss concept arrangements and their interconnected relationships, negotiate meaning, and construct knowledge (van Boxtel, van der Linden, Roelofs & Erkens, 2002).

Collaborative mapping as a pre-writing strategy has been the focus of research. Studies related to teaching students to construct concept maps collaboratively or individually had different results. For instance, Lee (2010) explored the effects of individual concept maps constructions versus collaborative concept maps constructions used by 75 Korean students’ writing. Results showed that collaborative mapping group had slightly higher scores than its counterpart. However, Liu (2011) investigated 94 freshmen computer-assisted concept mapping construction on their writing, and no significant difference in compositions between individual and collaboratively mapping was found.

Mixed results were also reported in the studies of the participants’ attitude and opinions toward concept mapping. For instance, Conklin (2007) investigated eighty-two 9 graders’ attitudes toward using concept mapping in expository essay writing in their Biology classes. The participants perceived concept mapping was a useful tool to visualize, plan, organize, think creatively. Kwon and Cifuentes (2009) introduced concept mapping to 160 seventh graders, including 74 boys and 87 girls. They all agreed that concept mapping helped them organized information leading to better understanding and the ability to answer questions easily. It also assisted them in memorizing the science concepts and retained the learned concepts to prepare for exams.

On the other hand, Ojima (2006) investigated three Japanese English as a second language writers’ attitude toward concept mapping. Results showed that collaboratively planning might not have been effectively applied to learners. Some of the participants had trouble to changing their writing habits, and expressed uncertain feelings toward the need for using this strategy. One thought they could cope with current writing tasks without maps. In line with the studies, Lee (2010) examined the effects of concept maps constructions used by 75 Korean students’ writing, and the participants’ opinions toward concept mapping. The findings showed that the participants’ attitude did not have any statistically change.

In order to clarify the issue and fill in the gap in the literature, this study attempted to explore the participants’ perceptions toward collaborative computerized concept maps as a pre-writing strategy before and after a six weeks writing program.

2. Method

2.1 Participants

Twenty tertiary level EFL university students participated in a six-week writing program by self-selecting their partners. The average of their TOEIC (Test of English for International Communication) test scores was about 762. The average age of the students was 18 years old, and the proportion of female participants was 75% while the male participants were 15%.

2.2 Instruments

The instrument was revised from Lee’s questionnaire (2010), in which 24 items were designed to evaluate participants’ attitude toward computer-based concept mapping (7 items), their perceptions of the usefulness of computer-based concept mapping (7 items), and their experiences and opinions toward collaborative concept mapping (10 items). Students rated the items on a five-point scale ranging from strongly agree (5) to strongly disagree (1). The questionnaire was validated by the researchers as appropriate for this study. The reliability was established at .83 (Cronbach’s α).

2.3 Procedure and data analysis

Before the writing program, the participants completed the pretest of attitude toward computer-based concept mapping questionnaire. Furthermore, to examine the effect of the computerized concept maps on the learners’
writing, the researchers introduced VUE (Visual Understanding Environment) to the students for its ease of manipulation. The software was designed by Tufts’ Academic Technology department and was commonly used in computerized concept mapping experiments (i.e., Kumar & Saigal, 2005; Kumar, Saigal, Chavez & Schwertner, 2004). Writers can create their nodes with different symbols, and display the relationship between each node with the connecting arrowed lines.

The formal study was conducted during a weekly two-hour writing class period. During the six-week writing program, the researchers chose several topics for the 6-week writing assignments including “An unforgettable memory about ____”, “A memorable social event in the past”, “Too much stress on teenagers?” and “How do you feel about the lottery fever in Taiwan?” respectively. The topics were chosen because they were related to students’ daily experiences.

Each topic was introduced with one or two sample paragraphs to activate their background knowledge before writing. The length of each composition was required to be at least 300 or 400 words. All of the students were asked to compose their own writings according to their maps, and the writing assignments were to be finished during the two-hour class period. At the end of this program, the same attitude questionnaire was administered as the posttest to the participants. Descriptive statistics and pair sample t-tests were conducted to evaluate the participants’ attitude change between the pretest and the posttest.

3. Results

Three constructs were designed to evaluate the participants’ attitude toward computer-based concept mapping, their perceptions of the usefulness of computer-based concept mapping, and their opinions toward collaborative concept mapping. Pair sample t-tests showed that even though they had significantly positive increase in the construct of computer-based collaborative concept mapping (p=.004), students did not have any significant attitude change toward concept mapping in their overall performance. The finding was in agreement with Chiu (2004), who explored the use of concept mapping by 96 students. Attitudes toward concept mapping did not have any significant differences after the program. Detailed analyses were illustrated as follows.

3.1 Attitude toward concept mapping activity

Generally speaking, no significant overall attitude change was observed in the first construct. Specifically, item 2 and item 6, designed to elicit learners’ self-perceived interest and fun toward using computerized concept maps, declined after six weeks of writing program. With regard to the three reverse items, the means of item 5, “Creating concept maps was time consuming.” and item 7, “Drawing concept maps was difficult for me.” increased while the means of item 3, “The concept maps I developed were useless to me in writing an article.” declined. Overall, students showed moderate agreement toward the statement that using concept maps can facilitate writing (pretest mean = 3.32, posttest mean = 3.25); however, as shown in the data, drawing concept maps was regarded as time consuming and difficult, resulting in the decline of students’ interest even though they thought concept maps were useful.

Table 1. Attitude toward concept mapping

<table>
<thead>
<tr>
<th>Questions</th>
<th>Pretest</th>
<th>Posttest</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
</tr>
<tr>
<td>1 I was interested in concept mapping as it was discussed in class.</td>
<td>3.55</td>
<td>.904</td>
<td>3.55</td>
</tr>
<tr>
<td>2 I enjoyed drawing concept maps to help me create an article.</td>
<td>3.60</td>
<td>.928</td>
<td>3.53</td>
</tr>
<tr>
<td>3 *The concept maps I developed were useless to me in writing an article.</td>
<td>3.38</td>
<td>.667</td>
<td>3.30</td>
</tr>
<tr>
<td>4 I want to know more about the use of concept maps.</td>
<td>3.68</td>
<td>.764</td>
<td>3.53</td>
</tr>
<tr>
<td>5 *Creating concept maps was time consuming.</td>
<td>2.68</td>
<td>.917</td>
<td>2.73</td>
</tr>
<tr>
<td>6 Concept mapping was fun.</td>
<td>3.50</td>
<td>.716</td>
<td>3.38</td>
</tr>
<tr>
<td>7 *Drawing concept maps was difficult for me.</td>
<td>3.05</td>
<td>.714</td>
<td>3.20</td>
</tr>
<tr>
<td>Subtotal</td>
<td>3.32</td>
<td>.382</td>
<td>3.25</td>
</tr>
</tbody>
</table>

*reverse items
3.2 Perception of the usefulness of concept mapping strategy

Although no significant differences were observed on learners’ perception in the construct (see Table 2), students’ had positive attitudes and higher rating in their perception toward the usefulness of computer-based concept mapping. The means of 7 items all increased after six weeks training. Specifically, the means between the pre- and post-survey of item 12, “I think that concept mapping helps me plan a more creative writing,” increased from 3.18 to 3.43. It showed the participants’ had an increasing agreement toward the usefulness of concept mapping in writing.

Table 2. Perception on the usefulness of concept map

<table>
<thead>
<tr>
<th>Questions</th>
<th>Pretest</th>
<th>Posttest</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 I think that concept mapping helped me organize my ideas in writing.</td>
<td>3.65</td>
<td>3.78</td>
<td>.303</td>
</tr>
<tr>
<td>9 I think that concept mapping helped me summarize my understanding of the topic.</td>
<td>3.63</td>
<td>3.68</td>
<td>.736</td>
</tr>
<tr>
<td>1 I think that concept mapping helped me recall more vocabularies and expressions for the given topic.</td>
<td>3.25</td>
<td>3.33</td>
<td>.596</td>
</tr>
<tr>
<td>10 My writing is easier when I use a concept map than my writing when I do not use a concept map.</td>
<td>3.28</td>
<td>3.48</td>
<td>.146</td>
</tr>
<tr>
<td>11 I think that concept mapping helps me plan a more creative writing.</td>
<td>3.18</td>
<td>3.43</td>
<td>.031*</td>
</tr>
<tr>
<td>12 I felt that concept mapping improved the quality of my writing.</td>
<td>3.45</td>
<td>3.65</td>
<td>.058</td>
</tr>
<tr>
<td>13 I use all the components in my concept map (e.g., nodes, links, hierarchical orders) to write my article.</td>
<td>3.45</td>
<td>3.58</td>
<td>.430</td>
</tr>
<tr>
<td>Subtotal</td>
<td>3.41</td>
<td>3.56</td>
<td>.086</td>
</tr>
</tbody>
</table>

3.3 Experience on collaborative concept mapping

In terms of the participants’ rating toward collaborative concept mapping, a significant increase can be found in the construct (p < .001). As reflected in the 10 item rating, the students had high satisfaction toward concept mapping and enjoyed constructed their concept maps collaboratively. The means of all of the items increased after six weeks of writing training. Specifically, the participants’ perceptions for item 17 “Our group concept map was closely related to my final composition,” and item 18 “During group concept mapping, I learned different connotations of English words” reached statically significant. These findings provided evidence that students considered collaborative mapping did help them in language learning and writing. It was in line with the studies of Ojima (2006), who proved that concept mapping have positive effects on learners’ perceptions.

Table 3. Experience on collaborative concept mapping

<table>
<thead>
<tr>
<th>Questions</th>
<th>Pretest</th>
<th>Posttest</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 Our group actively discussed the given topic while collaboratively creating our group concept map.</td>
<td>3.55</td>
<td>3.80</td>
<td>.616</td>
</tr>
<tr>
<td>16 I learned new words / expressions during our group concept mapping activity.</td>
<td>3.05</td>
<td>3.35</td>
<td>.745</td>
</tr>
<tr>
<td>17 Our group concept map was closely related to my final composition.</td>
<td>3.30</td>
<td>3.65</td>
<td>.587</td>
</tr>
<tr>
<td>18 During group concept mapping, I learned different connotations of English words.</td>
<td>2.85</td>
<td>3.30</td>
<td>.733</td>
</tr>
<tr>
<td>19 During group concept mapping, each group member took equal responsibility in developing our group concept map.</td>
<td>3.75</td>
<td>4.00</td>
<td>.562</td>
</tr>
<tr>
<td>20 During group concept mapping, I actively participated in discussions to develop our concept map.</td>
<td>3.95</td>
<td>4.10</td>
<td>.447</td>
</tr>
<tr>
<td>21 During group concept mapping, our group members discussed the meanings of concepts and their relationships.</td>
<td>3.60</td>
<td>3.95</td>
<td>.605</td>
</tr>
<tr>
<td>22 I feel that concept mapping facilitated our group discussion.</td>
<td>3.55</td>
<td>3.90</td>
<td>.641</td>
</tr>
<tr>
<td>23 In my writing, I used new vocabularies that I had learned from our group concept mapping activity.</td>
<td>3.35</td>
<td>3.45</td>
<td>.826</td>
</tr>
<tr>
<td>24 Our group concept map represents our group’s effort very well.</td>
<td>3.55</td>
<td>3.60</td>
<td>.754</td>
</tr>
<tr>
<td>Subtotal</td>
<td>3.45</td>
<td>3.71</td>
<td>.348</td>
</tr>
</tbody>
</table>
4. Conclusion

This research explored EFL learners’ perceptions toward computerized concept maps as a pre-writing strategy. While there were no significant differences in the attitude between the pretest and the post test, the participants had significantly more positive attitude toward collaborative mapping in language writing after the writing program. The result was in agreement with other studies which reported that constructing concept mapping collaboratively was a helpful and enjoyable activity in learning (Chiu, 2004; Kwon & Cifuentes, 2009; Lee, 2010). Collaborative mapping engaged students in discourse and provoked interaction (van Boxtel, van der Linden, Roelofs & Erkens, 2002), which may trigger learners’ learning effectiveness and process of knowledge acquisition (Stoyanova & Kommers, 2002).

There were several limitations of this study. Firstly, even though the participants found concept mapping beneficial and useful, they had increasingly negative attitude toward concept mapping activity in the 6 week writing program. This factor, along with other possible issues of academic workload, and motivation, represent limitations on the use of concept maps. In addition, no comparison group was employed in this study, and the training last only for 6 weeks. Therefore, using a control group and longer training duration were strongly suggested for future studies.

References


