THE EFFECTS OF MIND-MAPPING ON VIETNAMESE EFL STUDENTS' READING SKILLS

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Abstract: This study investigates whether mind-map is an effective learning tool to facilitate Vietnamese EFL undergraduate students' reading skills and students' perception towards the use of mind-map. The result indicates a positive attitude of students towards mind-map in generalizing the main ideas of the reading passage and vocabulary acquisition. Findings reveal that using mind-map in reading can help students grab the general idea of the reading text, review the text and new words as well as enhance motivation in reading. However, using mind-map as teaching reading raises some problems for students, such as idea selection and creativity when creating a mind-map. The application of this technique is considered to be useful, yet the fact that whether we should apply it in a team or individual remains unclear, which keeps teachers aware of this issue when applying this technique.
Keywords: Mind-map, motivation, reading skills, vocabulary acquisition

1. Introduction

The ability to decode, analyze, and interpret written materials is an essential component of success at the tertiary level (Ntereke & Ramoroka, 2017). According to Barnett (1989), reading comprehension is considered as an integral part of the teaching and learning process as its role in second language acquisition. Not only does it serve important purposes after the student's complete language study at school, but it also promotes literacy skills later on. Nevertheless, in the EFL context of Vietnam, research into reading comprehension shows that most Vietnamese students meet with great challenges when dealing with reading texts. They usually do not understand the texts and cannot complete the tasks due to their ineffective and inefficient strategies (Wood et al., 1998). Second and foreign language research also suggests that one effective comprehension strategy is the use of mind-mapping (Liu, Chen & Chang, 2010). However, in Vietnam, there seems to be a paucity of research into the use of mind-mapping in reading among first-year Vietnamese undergraduates. This is the motivation for the current study to be conducted to examine the effectiveness of mind-mapping on EFL students' reading skills.

The study seeks answers to the following research questions:

1. Does mind-mapping have an effect on Vietnamese freshman students' reading skills?
2. What's the students' attitude towards the use of mind-mapping on reading skills?

There are two hypotheses following the first research question:

Null hypothesis: There is no significant difference in the pre- and post-test score in students' reading skills.

Alternative hypothesis: There is a significant difference in the pre- and post-test scores in students' reading skills.

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2. Literature review

Mind-mapping is referred to as a cognitive tool that can be used to organize or summarize information while people are learning (Hillar, 2012). The fathers of mind-mapping, Buzan and Buzan (1996) defined the Mind Map as an expression of Radiant Thinking which refers to associative thought processes that proceed from or connect to a central point and is, therefore, a natural function of the human mind. They claimed that mind map was an influential graphic technique that can provide people with a universal key to unlocking the potential of the human brain (Buzan & Buzan, 1996). Murley (2007) described mind mapping as a nonlinear visual outline containing complicated information. She claimed that this visual technique has the ability to facilitate "creativity, organization, productivity and memory" (p.175). Krasnic (2011) referred to mind-mapping with a different name – visual mapping, which is connected to a diagrammatic tool employed to gather, generate, control, and exchange information.

In general, those definitions consider mind-mapping to be the application of graphic or visual images to help our brains capture knowledge effectively. Mind-mapping rules are based on the fact that human beings can retain graphic or visual information much more easily than the information presented in the form of words or numbers.

According to Buzan and Buzan (1996), mind-mapping had four important features. Firstly, the subject of attention was crystallized in a central image. This image concisely reflected the theme of the whole mind map. Secondly, the main subject matters radiate from the central picture like tree branches. Thirdly, on these branches or associated lines grew various phrases carrying information directly relating to the central image. Information of lesser importance will be presented on branches radiating from high-level ones. The Buzan brothers also noted that mind maps' liveliness and beauty can be enhanced by adding pictures, signs, or colors, which is believed to encourage the process of information recall. Finally, branches associated with a specific mind map would create a connected nodal structure. In this study, Buzan and Buzan's definition and characterization of mind-mapping will be employed.

As the present study aims to investigate the effect of mind mapping on students' reading skills as well as their attitude towards its application in the classroom, the attitude component here in would be viewed as a state of readiness, a tendency to respond in a certain manner when confronted with certain stimuli (Oppenheim, 2000).

For their features and functions, mind maps have been deployed by various researchers in their research contexts to facilitate the teaching and learning process. Budd (2004) used mind maps as an exercise tool in classroom activities in group work to help engage his students of Economics. He granted one hour for each group to design a mind map on their own. The finished products were then attached to a bulletin board and discussed by the whole class. A year later, after his research had been completed, Budd conducted an online survey with the participation of the students who had enrolled in his class in the previous year and taken part in his mind-map designing activities. There were 39 responses returned which accounts for a rate of 60 percent. The data collected from this online questionnaire yielded a neutral result regarding the question asking the participants whether they had learned a lot from the Mind Map exercises they had done in class with their peers. The researcher notes that specific students who preferred "doing" learning styles all agreed with the mentioned statement. Another significant finding reported by Budd is that the students who expressed their favor towards the importance of learning exercises confirmed that the amount of knowledge they had gained from the Mind Map exercise was great. The results from Budd's study demonstrate that the application of mind maps in class does have an effect on individuals whose learning

style is more of a "doing" manner, meaning that they prefer applying taught theories into practical exercises, as claimed by Budd (2004).

In recent research, Tungprapa (2015) introduced a number of mind-mapping software to his master-degree students and required them to design their visual maps by using computer programs and put forward to summarize the main theme of each lesson in the course entitled Educational Research Methodology. Though the sample of the study merely incorporated a small number of participants - specifically 27 master-degree students, it presented interesting results that are worth noticing and mentioning. The researcher carefully constructed a suitable system of research tools with the inclusion of 4 sets of documents yielding results that can be considered reliable enough. It was reported that the respondents' post-study attitudes towards the use of electronic mind-maps after they had undergone the treatment were higher than those of their pre-study (Tungprapa, 2015).

From the review of the aforementioned works on how investigated students felt about the employment of this technique in studying, it can be acknowledged that mind-mapping can provide an interesting and effective means to aid students' memory and that students may be excited about employing this method during their learning process. Those can be the good reasons supporting the application of mind-mapping in teaching phrasal verbs in the context of EFL classrooms in secondary schools in Ho Chi Minh City, Vietnam as it is missing from the body of the literature.

In the natural science field, mind mapping can be applied in medicine to enhance the capacity to memorize items. A study conducted by Farrand et al. (2002), whose participants were medical students, reported that the subjects who received the treatment - which was the mind-map technique - could recall 10% more than those who underwent normal research technique (as cited in Anderson et. al, 2015). Apart from the medical field, mind mapping was also exerted by Lee (2012) to teach non-law students issues relating to medical law. She confirms that after experiencing the employment of mind-mapping in her classroom, the method can enhance student understanding of health law and encourage classroom discussions. In addition to the positive outcome, she notes that the result is obtained since mind maps appeal to students for pondering upon special issues in a contextual manner (Lee, 2012).

On the contrary, in the social science field, mind mapping can be largely applied in education as a means to create more motivation and similarly aid students' memory. As above mentioned, Ellis (2009) describes mind-mapping as an effective method to take notes in studying. He states that one benefit of mind maps is their quick, vivid, and accurate demonstration of the relationship between ideas. Besides, they can also enable people to think from a general stand to a more specific perspective. As suggested by Ellis, mind mapping provides benefits for learners and he failed to allude to teachers' side. Similarly, Salvador (2007) discusses the applications of these studying tools – mind-mapping – in class. She claims that mind maps can be used to review what learners have been taught in class for them to be able to take advantage of previous lessons. The first step they need to do was to reflect on what they have been taught. Mind maps, which had been extensively used throughout the year were again applied, this time to provide a summary of everything they had been taught. In short, mind maps can be a wonderful means to help learners summarize their old lessons so that they can memorize much longer.

Not only can mind maps assist students in improving their memory capacity but it can stimulate them as well. Green and Reid (2009) also discussed the effect of using mind maps to study. They agreed that mind maps are an effective technique to make connections because they present only relevant material in a clear and memorable form. Mind maps are also a good method to use visuals, make connections, and assist

the organization. From the study, they can conclude some benefits that mind maps can bring along. Mind maps can inspire students' interests and can also make them more receptive and cooperative in the classroom; because mind maps tend to present only relevant knowledge in a clear and memorable form, students tend to get better marks in exams.

In her graduation paper *Mind-mapping in the EFL classroom*, Hofland (2007) states in her work that mind-mapping is a technique that offers many possibilities for EFL teachers. In other words, mind-mapping can be used to support various language learning activities. Moreover, it enhances learner motivation involving creativity into tasks that are usually focused on the left side of the brain. Specifically speaking, through her research, she discovers that there are five advantages of mind-maps over classical note-taking techniques. The main benefit is that you can use both halves of the brain, which makes it easier to remember. Moreover, she believes that making a mind-map is fun, and students like it because it is not boring. The second strength of using mind-mapping is that it can save time because learners can memorize the subject material much faster so it may take less time to teach it to them. The third advantage is that mind-maps can make the revision easier and faster because they are compact and brain-friendly. The fourth one is that a mind-map can make it possible to look over and think over the different relations between key topics. This can be very useful when writing an essay or developing or working out an idea. Finally, the last advantage is that when new information is given, it can be easily added to the mind-map by adding a new branch. After finding out these advantages of mind-mapping, the author concludes that many pupils like the creative aspect of mind-mapping and benefit from these activities although mind-mapping could appear to obstruct at first. Moreover, she would keep using mind-mapping activities in her lessons and she believes that there are still many more ways to use mind-maps for her to discover.

In a research context that is quite similar to Vietnam, Laohawiriyanon and Siriphanich (2010) conducted a study to investigate the effect of mind mapping technique on Thai EFL university students' reading comprehension. The research employed the pretest and posttest design to conclude that mind mapping had an effect on improving the reading test scores of Thai students by reporting that the post-test scores were higher than those of the pre-test at the 0.05 level of significance. In recent work, Fiktorius (2013) provides a critique of the use of mind-mapping in the context of EFL classrooms after he reviewed the literature. He confirms that mind maps bring along more advantages than traditional ways of note-taking do. Specifically, mind mapping can supply students with a more appealing overall picture for them to be attracted more into lessons or classroom activities.

In general, while some of these above-mentioned studies cover quite a large scope of research, i.e., generally adopting mind maps to enhance student motivation or encourage the application of the tool, others focus on specific fields which include the use of mind mapping to teach specific English skills, vocabulary or grammar. Little can be found on the application of mind mapping in teaching reading skills to EFL students, especially in Vietnamese educational settings. As a result, it is a motivation encouraging the researcher to attempt to explore and bridge this gap in the literature.

The final part of this section is dedicated to the conceptual framework of the study to show the interconnection among relevant factors. As shown in the chart, two operational definitions proposed by Buzan and Buzan (1996) and Oppenheim (2000) have been employed to define two major terms, i.e. *mind map* and *attitude*, as well as their characteristics. Based on this framework (Figure 1), the participants would be instructed to design mind maps based on certain passages and then their attitudes would be interviewed to shed light on the effect of the instrument.

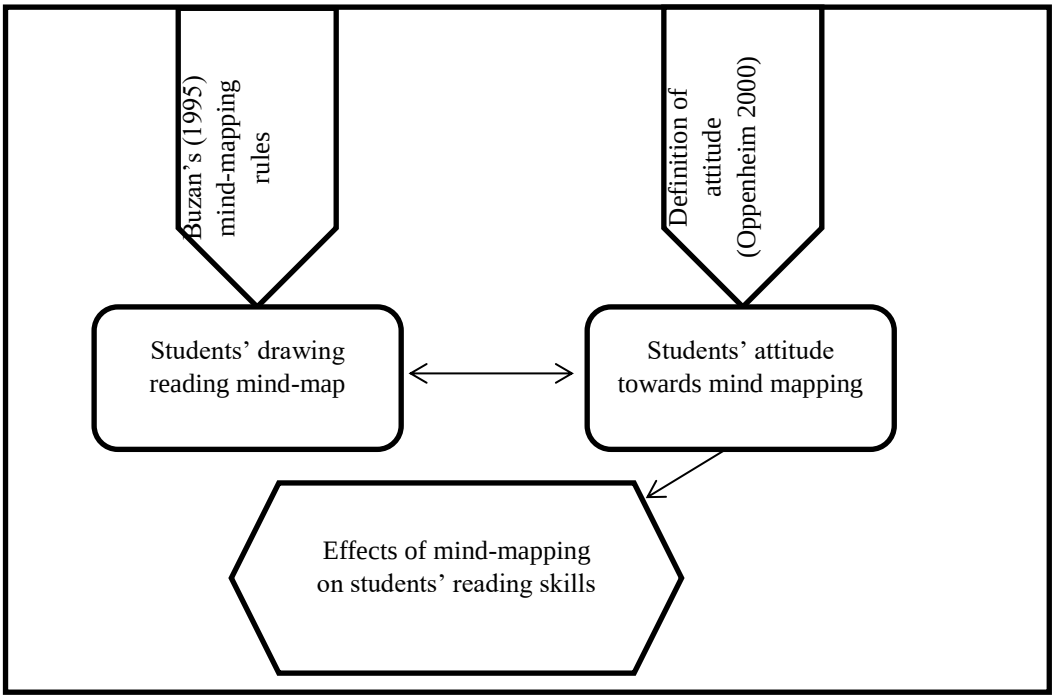

Figure 1. Conceptual framework

3. Research methodology

This study is to examine the effectiveness of mind-mapping on students' reading skills and their attitude towards the use of mind-mapping in the classroom. Explanatory Mixed methods designs (QUAN-qual Model) is employed. According to Gays, Mills and Airasian (2011), the quantitative approach is suitable to study the cause-effect phenomenon while the qualitative approach is sufficient to investigate students' perceptions towards the given phenomenon. In this study, mind-mapping is the learning tool for reading skills. The researcher conducted an experiment to collect primary data; then distribute a questionnaire followed by an interview to gain an insight understanding.

3.1. The research site

This study is conducted at a public university in Ho Chi Minh City, Vietnam. After asking permission to conduct the research from the Dean of the English Faculty and receiving approval, the researchers carried out the study by collecting data from undergraduate students.

3.2. Participants

There are 40 (15 males and 25 females) students chosen to conduct this single subject experiment. The students are freshmen and randomly selected into one class by the school administration from the beginning of the semester, so there is a mix of levels in this class.

3.3. Sample and sampling

The convenience and purposive sampling are employed in this study because of the previous working experience with the school and the targeted level of the students. The result of this research; therefore, cannot be generalized to the whole population since according to Gravetter and Forzano (2015), it does not exclude the random elements.

3.4. Research instruments

In this study, the quantitative data is gathered through the pre-test, post-test, and a questionnaire. Both the pre-test and post-test are designed to suit the students' level by the English Faculty's teachers to ensure the reliability of the study. The tests are also examined by a council of experts in the school. This written test includes 3 skills of English: listening, reading, writing. The researchers approached the test and selected the reading part only to have the final score in both tests. The reading part includes 4 paragraphs with 4-5 questions each. They are designed to test both reading for gist and reading for details. After finishing the test, the students were then distributed a questionnaire to ask about their attitude towards the given learning tool- mind-mapping for the reading skills. This questionnaire is adopted from the study of Lucha, Gemeda, and Jirenya (2015). The three subscales of the questionnaire are the importance of mind-mapping in promoting students' EFL reading skills, The Students' Roles in mind-mapping, students' responses related to their attitude towards mind-mapping. In this study, the questionnaire is in both English as the original version and Vietnamese as a translated version. Before distributing, the research approached two experts: one is a linguistic expert and one is a TESOL expert to ensure that the translation has the closest meaning to its origin. Furthermore, the questionnaire was also sent to a group of Vietnamese students to eliminate any ambiguity elements. About the intervention, the mind-mapping technique was continuously applied for 14 weeks to test its effectiveness.

The qualitative data is to gain an insight into the student's attitude, and the questions of the interview are built based on these three subscales. For the interview, 6 students were chosen based on their academic

performance from the test: 2 from the low level, 2 from the average level, and 2 from the advanced level. The interview questions were developed based on the questionnaire with detailed questions to gather in-depth information from the students for the effectiveness of mind-mapping. The set of interview questions was also sent to TESOL experts to validate its reliability and validity.

4. Findings and discussion

4.1. Findings from quantitative data

Overall, it could be observed that the participants from the first group had a tendency to perform better in their post-tests. After running the Boxplot method, it is shown that there are no outliers in the subjects' test scores.

In the first research question, the researchers wanted to find out if there is a significant difference in the pre and post-test scores. The results indicate that there is a significant difference in the pre and post-test scores, the null hypothesis is therefore rejected and mind-mapping is shown to have effects on students' performance.

Table 1. Descriptive Statistics

Sample	N	Mean	StDev	SE Mean
Pre-test	40	8.418	1.457	0.230
Post-test	40	7.185	1.498	0.237

To be more precise in terms of data, Table 1 is included to demonstrate the mean scores of two sets of tests together with their standard deviations and standard error means even though they have been summarized in the table above. It can be observed that all figures of the post-test scores are higher than those of the pre-test.

Table 2. Estimation for Paired Difference

Mean	StDev	SE Mean	95% CI forμ_difference
1.233	1.984	0.314	(0.598, 1.867)

μ_difference: mean of (Pre - Post)

Test

Null hypothesis	H_0: μ_difference = 0
Alternative hypothesis	H_1: μ_difference ≠ 0

T-Value	P-Value
3.93	0.000

As illustrated in Table 2, it was found that there was a statistical difference between the pretest and posttest scores as the results have shown that t=3.93, $p_{2\text{-tailed value}}$=.000 which is smaller than p=0.05.

4.2. Findings from qualitative data

The findings from the questionnaire were supported and clarified by using a structured interview. The interviews were conducted with six students as samples. In this part, the discussion of the data is about students' perceptions and attitudes towards the use of mind-mapping in learning reading skills. Based on the interview, most of the students generally had positive perceptions and attitudes towards the use of mind-mapping in improving their reading skills. The specific elaborations, which are analyzed based on the students' proficiency level, are as follows:

The first question related to the importance of mind-mapping in promoting students' EFL reading skills. The students were asked whether they found mind-mapping an effective tool to improve their reading skills and whether it helps motivate them to further practice reading skills. Most of the students generally had positive perceptions towards the use of mind-mapping while some of them also raised a few concerns.

Regarding the effectiveness of mind-mapping on reading skills and motivation, 4 students from all levels agreed that mind-mapping has effectiveness in their studying reading skills. This finding was consistent with Hoffland's (2007) and Salvador's (2007) studies, which both concluded that the use of mind-map helped EFL learners to memorize the content much better. One student said:

> *Using mind-maps helped me get an overall understanding of the text. It made it easier for me to remember the main points and learn new words.*

They also expressed that their motivation in reading improved thanks to mind-mapping. One student stated that:

> *It helps me to review the lesson much faster and I like this about mind map. I can also be creative in the way I design my mind-map, so it helps me remember the information much longer.*

Nevertheless, a few students were uncertain of the effectiveness of mind-map and thus were not strongly motivated. Two students (one from higher - and one from middle-level of proficiency) expressed that:

> *Well, I think the texts are quite short and the information is easy to understand, so there is no need to use a mind-map. For short simple texts, I think I have been used to the traditional method of note-taking and I can learn better this way. I think mind-mapping is more suitable for longer and more condensed information-packed texts.*

In addition, one student (low-level) said:

> *think mind-map is useful but I found it difficult to identify keywords and which information I should note. I need more training on using mind-map.*

The second question is about the students' roles in mind mapping. The students were asked whether they interacted with other group members and whether this interaction benefited them. A few expressed that they did learn new vocabulary from their peers. One student (lower-level) said that:

> *When I don't understand the words, I ask my classmate for help. My friend also helps me with how to make mind-map*

On the other hand, most of the students raised concerns about the idea of pair-work/group-work in mind-mapping. One student (higher-level) stated that:

> *I think it requires all the members to know how to work in groups. Otherwise, this is not effective - only one student does all the work while others are not involved.*

Similarly, one student (middle-level) expressed that:

> *I think I work alone better than in a group. I can look up words on the internet if I want to know the meanings. If the text is difficult, I will ask my friends for help.*

The last question is concerned with the students' attitudes towards mind-mapping. Most of the students affirmed that mind-mapping made reading lessons more interesting to learn besides the traditional teaching method of translation and the "ask and answer question" style. This was in line with the study

conducted by Fiktorius (2013), who supported that mind mapping was more appealing than the traditional note-taking style. Nevertheless, a few expressed their negative attitudes. Specifically, one student (lower-level) said that:

> *I think I need more training on how to make mind-map more effectively. I cannot identify the keywords and how to take notes.*

One student (higher-level) said that:

> *I think mind-map is useful for learning vocabulary instead of reading skills. For reading, I think it just helps me memorize the gist, not the details. So, I still need to go back to read the text.*

4.3. Discussion

The questionnaire emphasized three main themes: The importance of mind-mapping in promoting EFL students' reading skills, students' responses related to their attitude towards mind mapping, and their roles in mind-mapping. According to the quantitative data collected after the questionnaire, the majority of respondents showed a positive attitude towards mind-mapping as it is a useful tool for them to acquire the reading skills easier and more thoroughly in terms of organizing the ideas and summarizing the reading content. To gain an insight into students' opinions towards mind-mapping, the team of researchers also conducted an interview in which its explanation is presented accordingly.

In general, using mind-maps in teaching reading can help enhance student motivation in teaching reading. To be more specific, students can apply this method to summarize the ideas of the reading passage - correlating with Salvador (2007) and the study also found out its benefits from students' opinion towards mind-mapping in acquiring new vocabulary. Moreover, this application makes the lessons more exciting, thus stimulating the students to emerge in the lessons which are considered to correlate favorably well with Budd (2004), Green and Reid (2009) support the role of mind mapping in teaching. Hence, this technique is considered to be useful for students if they want to review their lessons later.

Also, from the qualitative result of the study, the fact that whether we should apply it in a team or individual remains unclear, as some students still do not prefer drawing mind-map in groups, as they do not know how to work effectively with their peers. Another drawback is that students do not know how to effectively draw a mind-map to remember the information in the reading passages.

5. Conclusion and implication

In conclusion, the mind-mapping technique was proved to be effective in teaching English reading skills as the students could memorize the new vocabulary easily, and they can remember themain ideas of the reading after classor it is easy for them to review the reading passages. The technique also engaged their excitement and encourage them to develop creativity skills. However, it depends on the students' preferred learning styles to apply the teaching technique as some do not prefer group work for mind-mapping activities. Before introducing the technique, teachers are necessary to have thorough instructions so that students can engage and know how to make a mind-map from selecting the right main ideas from the given readings.

There are some implications that teachers should consider when applying this technique for their students in reading classes. First, teachers should encourage students to draw mind-map for their reading texts, to better remember the texts as well as the new vocabulary presented in each lesson. This, therefore, can motivate students to read more. Second, as one of the students' concerns is the grouping method, it is

better to be aware of group work. If teachers wish to let students work in groups, it is suggested that teachers should be the one to supervise and ask students to work together. Another method is to ask students to work in pairs or individually. In this way, they can create their mind-map with their own choice and at their own pace. Thirdly, the fact that how to draw a mind-map can pose some difficulties for students, it is suggested that teachers should train students on how to draw a mind-map. To be more specific, they should instruct students on the basic notions and organizations of a mind-map. Then they encourage students to select the essential information to be drawn on the mind-map. Doing this can erase the initial confusion when students encounter mind-maps and help them to be more confident when employing this technique in their reading lessons.

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ẢNH HƯỞNG CỦA SƠ ĐỒ TƯ DUY ĐỐI VỚI CÁC KỸ NĂNG ĐỌC CỦA SINH VIÊN VIỆT NAM KHI HỌC TIẾNG ANH

Tóm tắt: Một số nghiên cứu tập trung vào tính hiệu quả của sơ đồ tư duy đối với các kỹ năng đọc. Kết quả của những nghiên cứu này chỉ ra rằng việc sử dụng sơ đồ tư duy có mối tương quan tích cực với việc sinh viên đọc hiểu. Nhằm nỗ lực để cung cấp thêm bằng chứng cho những phát hiện trước đó, nghiên cứu này điều tra xem liệu sơ đồ tư duy có phải là một công cụ học tập hiệu quả để tạo điều kiện cho các kỹ năng đọc của sinh viên đại học học tiếng Anh tại Việt Nam và nhận thức của sinh viên về việc sử dụng sơ đồ tư duy. Kết quả cho thấy sinh viên có thái độ tích cực đối với sơ đồ tư duy trong việc khái quát các ý chính của các bài đọc và thu thập từ vựng; tuy nhiên, cũng rút ra được một số nhược điểm nhất định. Các phát hiện cho thấy rằng việc sử dụng sơ đồ tư duy trong môn đọc hiểu có thể giúp học sinh nắm bắt ý tưởng chung về bài đọc, xem lại văn bản và từ mới cũng như tăng cường động lực trong việc đọc. Nói cách khác, việc áp dụng kỹ thuật này được coi là hữu ích. Tuy nhiên, thực tế là liệu chúng ta nên áp dụng trong một nhóm hay đối với cá nhân vẫn còn chưa rõ ràng. Hơn nữa, sử dụng sơ đồ tư duy trong việc dạy môn đọc tạo ra một số vấn đề cho học sinh, chẳng hạn như lựa chọn ý tưởng và tính sáng tạo khi thiết kế sơ đồ tư duy. Vì vậy, giáo viên cần lưu ý về vấn đề này khi áp dụng kỹ thuật này.
Từ khóa: Sơ đồ tư duy, động lực, kỹ năng đọc, tiếp thu từ vựng