# Junior High School Teachers' Perception of the Use of Digital Mind Maps

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## ABSTRACT

In support of developing 21st-century skills, this research aims to investigate Junior High School teachers' perceptions of the use of digital mind maps in learning English subjects. A questionnaire adapted from the Sabbah (2015) and Faste & Lin (2012) models was used to find out the teachers' perception of (a) the use of digital mind map software, and (b) the use of digital mind maps in English learning. Interviews were also done afterward to confirm the questionnaire results. It was found that most respondents believed that digital mind maps were more practical to do, enable work to finish faster and give room for creativity. Mind maps can be used for any topics, genres, skills, and language focus, though mind maps for listening need more exploration. It is suggested that further research involving more respondents in more specific limitations is conducted.

**Keywords:** Teacher's perception, digital mind mapping, junior high school.

## INTRODUCTION

Proposed by Tony Buzan (1996), a mind map is an effective graphic tool that offers a universal key to accessing the brain's potential because it is implemented based on how the brain stores information. Research shows that the brain is a series of a nerve cells with a plethora of branches. This helps the brain to process memory that varies significantly from word to word and column to column. To remember quickly, the brain requires a method for the saved pieces to be expressed back in various ways and the mind mapping technique is created just like the branches of the brain that store information. Mind maps become a storage device, data removal, and unprecedented access to a vast library, which exists in the incredible brain since mind mapping assists in collating and storing as much information as desired and grouping it in a natural way (Buzan, 2009).

Mind mapping is a visual document that assists in identifying words or ideas, often with colors and symbols. It usually follows a hierarchical or tree branch format, with subsections branching off from it. Mind mapping allows more extraordinary imagination when capturing ideas and information and allows a note-taker to capture words related to visual representation. In addition, mind mapping helps define the main section's key concept more precisely, explain complex relationships between an idea and another more logically and easily understood, promote information recalls faster and more efficiently, and put information addition at ease

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(Buzan, 2009; Awad and Hegazy, 2016). The accessible structure of the map would make it much easier for the brain to establish a new connection in the production of a more imaginative note, such as in reading comprehension activities, the planning of essay writing, and so on.

As technology advances, digital mind maps are developed to replace manual mind maps, bringing modern pedagogy into the fourth industrial revolution (Jbeili, 2013). Nowadays, in line with the advancement of technology, the digital mind map was introduced, utilizing computer-generated visual diagrams to promote any teaching and learning activities at ease. Karim (2018) explained that a switch from pen and paper to a digital tool had created many advantages for student brainstorming sessions. Furthermore, the digital mind mapping technique helps reduce allocated time for each step due to more effective and quicker moves, minimize the excess materials due to the easy add-and-delete process, and put all effort in an effective manner (Sabbah, 2015; Awad and Hegazy, 2016).

Various websites and applications allow us to make a more eye-catching mind map digitally by allowing us to add images and videos, and drag and drop symbols, unbounded with paper size limit (Riley & Ahlberg, 2004). The use of hyperlinks and a dynamic mind map can digitally connect different ideas to be externalized as a structured neural network containing textual and visual representations of concepts, derived from a core idea and disseminated as related information sections (Riley & Ahlberg, 2004; Chen, Mohanty, Rodriguez, & Krishnamurthy, 2019).

Moreover, creating mind maps is getting more practical, while saving and sharing one whole map or parts of it is easy to do anytime, anywhere, with any social media platforms (Awad and Hegazy, 2016; Orlova, 2017; Normawati, 2020).

Digital mind mapping not only enables teachers and students to conceptualize knowledge, brainstorm and categorize concepts, construct information, and solve issues more logically, but also engages students, encourages creativity and teamwork, and boosts their confidence in contributing ideas in class (Nong, Pham, & Tran, 2009). Awad and Hegazy (2016) added that digital mind maps appeared much more consistent and cleaner, and dynamic and interactive in the learning environment when compared with manual mind maps.

Nevertheless, digital mind maps also have disadvantages. Fadilah (2019) revealed that the first (or early) trial of digital mind map creation took students longer to complete their work. Unavailability of the facilities such as computers/smartphones and internet access and inability to use the devices, applications, or platforms were also obstacles. Yet, those must not stop teachers and students to try the digital mind map technique.

Using digital mind maps in the teaching-learning process promotes the mastery of 21st-century skills, among which are *critical thinking, creativity, collaboration, communication skills*, *ICT literacy, information literacy, productivity,* and many more (P21's Frameworks for 21st Century Learning, 2019). Higher-order thinking skills are encouraged when creating, organizing, and structuring ideas,

enhancing their comprehension of certain issues (Novak & Cañas, 2006). Critical thinking skills are promoted when analyzing, interpreting, evaluating, summarizing, and synthesizing knowledge and information for the mind maps (Trilling & Fadel, 2009). Communication skills are implemented when transferring information while ensuring that the meanings are successfully represented by considering the audience and medium (Ananiadou & Claro, 2009; Katz, 2007).

The 2013 English curriculum in Indonesia focuses on developing competencies needed for the twenty-first century (ACDP, 2017). Also, when it comes to the English subject, English teachers are under much pressure to produce fluent speakers of the language to fit the twenty-first-century challenges (Suherdi, 2012). Teachers should encourage themselves to achieve critical reflection, an action or phase in which an event is recalled, considered, and assessed, ideally concerning greater purpose (Richard, 1998). At the same time, 21st-century teachers should prepare their students to become literate and independent, so they can access information efficiently and effectively, evaluate information critically and competently, use information accurately and creatively, pursue information related to personal interests, appreciate literature and other creative expressions, and also, strive for excellence. This empowers teachers to rethink how they see themselves as effective English teachers in the 21st century, preparing their students with

strategies to catch up with any changes and advancements.

Prayoga, Padmadewi, and Agustini (2020) revealed that Senior High School English teachers included learning and innovation skills into their objectives and activities in the lesson plans, and they taught the students by incorporating learning and innovation skills. Pratolo and Solikhati (2020), moreover, stated that the teachers in the EFL class used computers and smartphones as digital literacy tools in learning English, which in turn improved the students' digital literacy skills. Utilizing digital literacy as a learning facilitator and motivator can help the students ready for real digital environments (Laksani, 2019). Therefore, the implementation of $21^{st}$-century skills has to be integrated into all aspects of school and classroom instructions. Digital mind mapping is one of them, other than the use of videos, podcasts, digital scrapbooks, comic strips, digital worksheets, and others.

Studies into digital mind mapping have been done concerning various levels and skills. Digital mind maps improve university students' reading comprehension allowing them to understand the relationships and linkages between the primary concepts and the sub-ideas and the details and notes connected to these ideas (Stankovic, Besic, Papic, & Aleksic, 2011; Mohaidat, 2018), improve preschoolers' vocabulary and listening comprehension (Koster, Wilt, Kruistum, & Veen, 2017), give a significant impact on first semester students' speaking skills (Wahyudi & Irawati, 2020), enhance the students'

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writing skills in English, especially in arranging content, enthusiasm to study English, and promoting reasoning and critical thinking skills (Siriphanich & Laohawiriyanon, 2010), and offer a significant improvement in the students' knowledge of different parts of speech (Normawati, 2020).

However, studies investigating the teachers' perception of the use of digital mind maps in learning English subjects at the Junior High School level are still scarce. The perception of one teacher to another varies depending on the teacher's background and understanding. Teachers organize information into meaningful units using pedagogical knowledge gained from experience. Several studies have shown that professional teachers often incorporate concerns about teaching and learning while evaluating classroom activities, while amateur teachers tend to focus on surface-level issues, including teacher and student characteristics. This means that creating an efficient learning environment and organizing the classroom are closely linked to the activities experienced by teachers and the visual processing that occurs as a result of those perceptions.

Hence, the researchers would like to investigate the Junior High School teachers' perceptions of the use of digital mind maps in learning English subjects.

## METHOD

This study employed the mixed method, as suggested by Creswell (2009) that a mixed-method helps collect, analyze, and incorporate quantitative and qualitative data at the point of the research process in a single study to understand an issue thoroughly.

Data were collected through the use of a questionnaire and an interview. The questionnaire was adapted and modified from Faste & Lin model (2012) and the Sabbah model (2015). It is divided into two parts; (a) the use of digital mind map software, and (b) the use of digital mind maps in English learning, including the three main sections; speed and efficiency, appearance and mechanics, and ontology and concept mapping. Closed-ended questions were used in this study, which contains scaled questions. Then, the researcher constructed the interview questions based on the questionnaire. Interviews were conducted after the questionnaire was completed.

Prior to the questionnaire and interview, a preliminary survey of the Junior High School teachers in Java, Sumatera, and Kalimantan in the academic year 2020/2021 was conducted to ensure that the respondents of the study have used digital mind mapping in their teaching-learning process. It was found that only 10 English teachers were eligible for further questionnaire and interview sessions, both of which were done online.

**Table 1. Respondent Identity**

| Characteristics | % |
| --- | --- |
| Gender | |
|     Female | 100% |
|     Male | - |
| Age (Years) | |
|     31-35 | 20% |
|     36-40 | 40% |
|     41-45 | 30% |
|     >45 | 10% |
| Teaching Experience (Years) | |
|     6-10 | 20% |
|     11-15 | 50% |
|     16-20 | 30% |

As seen in Table 1 that all respondents are female teachers, mostly aged between 36-40 years old (40%) and have 11-15 years of English teaching experience (50%). All of them were confirmed familiar with digital mind mapping, had used it to teach, and had introduced it to their students during English learning in class.

## FINDINGS AND DISCUSSION

The questionnaire and interview sessions revealed that the topics or genres the respondents taught using digital mind maps varied, though most of them admitted using the digital mind maps when teaching types of text, such as recount text, descriptive text, and other kinds of text. Some teachers also used digital mind maps to teach grammar and vocabulary, as stated in the interview as follows.

*"Untuk topiknya itu saya karena SMP ya, contohnya misalkan kayak procedure itu saya pakai itu juga. Descriptive saya pakai itu juga. Kadang juga kalau narrative saya pakai juga. Mayoritas saya pakai semua. Report text saya pakai juga, gitu. Karena itu bagus ya, sangat membantu gitu."*
**(Teacher 1)**
*"Biasanya Ibu itu pakai teks. Teks itu kalau bahasa Inggris ini kan ada teks report, gitu kan. Terus deskriptif. Nah yang seperti itu."*
**(Teacher 2)**

In addition, the applications that the teachers primarily used were *Microsoft Word* and *Microsoft PowerPoint*. The other less frequently used applications were *Canva*, *MindApp*, and *MindMeister*, as stated by some teachers during the interview.

*"Kalau disekolah kami memakai Power point. Saya belajar sendiri dengan melihat contoh yang sudah ada, kadang juga diajarkan teman saya."*
**(Teacher 3)**
*"Sebenarnya sih kalau secara spesifik, pakai power point. Terus, pernah juga pakai canva. Itu doang sih."*
**(Teacher 4)**

Figure 1 shows the teachers' perception of the use of digital mind map software, which was divided into 10 statements.

Statement number 1 indicates that half of the respondents (5 teachers) had used digital mind maps quite often while the other half (5 teachers) used digital mind maps several times in the classroom to teach English.

Statement 2 revealed that 50% of respondents showed the urgency to teach their students how to use and create digital mind maps to study English materials. The other half taught their students how to utilize a digital mind map in the classroom to study English materials, but not always explicitly. See the teachers' statements below.

*"Saya juga ngajarin ke anaknya. Kan biasanya mereka nanti presentasi, gitu. Jadi, laporan dulu ke saya. Dia bikin, saya ajarin nih secara keseluruhan. Nah terus setelah itu bikin kelompok. Setelah bikin kelompok, baru mereka menyetor ke saya. Misalkan minggu ini grupnya siapa, nanti kita siapkan itunya (digital mind map). Tapi mereka belum punya laptop, jadi pakai punya saya laptopnya."*
**(Teacher 1)**

*"Ya. Praktek (membuat digital mind map) di kelas."*
**(Teacher 7)**

Statement 3 indicates that 40% of them explained their digital mind map to their students as a model while the rest 60% explained it in general.

All teachers involved the use of a digital mind map for reading material in English lessons and asked their students to make one. Here were the teachers' statements.

*"Kebanyakan saya buat reading, membaca. Kalau menulis kan saya biasanya pakai poin-poin gitu kan. Sama writing. Kalau yang lainnya saya biasanya pakai ini (cara) sendiri gitu."*
**(Teacher 1)**
*"Membaca sih ya, karena sekarang kan online ya sekolahnya. Jadi saya share dulu materinya, anak-anak pelajari dulu, kadang ada google meet, nah baru disitu kita jelaskan."*
**(Teacher 9)**



Figure 1. Teacher's Perception on the Use of Digital Mind Map Software
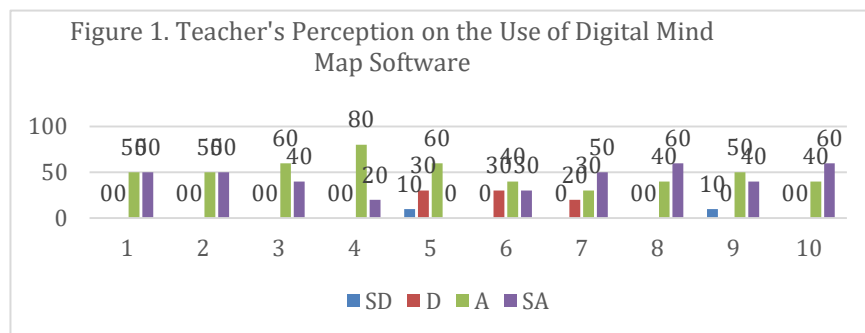
The use of digital mind maps for listening materials was claimed by 60% of respondents, while the rest 40% did not. For speaking, 70% have used digital mind maps while 30% did not. Below are the respondents' statements during the interview sessions.

*"Ya. Siswa saya minta untuk membuat digital mind map tadi saat pembelajaran speaking. Karena ya sekarang kurikulum 2013 siswa diminta untuk lebih banyak berkomunikasi, jadi banyak ungkapannya."*
**(Teacher 3)**
*"Ya. Menulis dan Berbicara (presentasi)."*
**(Teacher 7)**

*"Belum pernah (menggunakan digital mind map untuk kegiatan speaking)."*
**(Teacher 8)**

80% of respondents encouraged their students to create a digital mind map for writing materials in English lessons while 20% of them did not, as shown below.

*"Oh, kalau Ibu sepertinya menulis. Mereka kan nanti bikin peta konsepnya dari sana, terus udah dapat peta konsepnya, kemudian mereka bisa bercerita, gitu, dari peta konsep yang mereka bikin. Larinya nanti kan karena mereka sudah tau peta konsepnya apa gitu kan, nanti mereka bisa menceritakan kembali dari peta konsepnya itu. Nanti Ibu larikan mereka ke telling the story, kalau misalnya tentang teks report gitu kan. Misalnya buah-buahan, kan macam-macam, terus buah ini vitamin apa aja yang ada di dalam buah itu kan beda-beda, nah seperti itu. Jadi bisa melaporkan ke guru, gitu."*
**(Teacher 2)**

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*"Sebelum pembelajaran daring saya pernah menginstruksikan siswa kls 9 untuk membuat digital mind map berupa menulis."*
**(Teacher 10)**

All respondents agreed (though on different levels) that using a digital mind map is more practical than using pen and paper to make a mind map. 90% of them found that digital mind map provides more space than

using pen and paper to create mind maps. 100% believed (though on different levels) that digital mind maps save a lot of time because the software makes work done way faster.

Figure 2 shows the teachers' perception of the use of digital mind maps in English learning, which were divided into 13 questions.



Figure 2. Teacher's Perception on the Use of Digital Mind Maps in English Learning
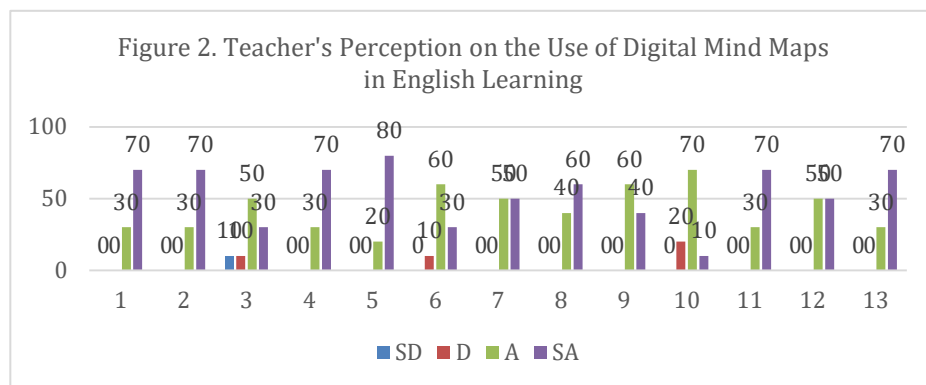
All respondents believed that digital mind maps help students learn English. See the interview results below.

*"Yes. Insyaallah sangat membantu, karena mereka jadi tau poin-poinnya. Terus, kan udah termasuk contoh-contohnya. Malah, terkadang mereka bisa lebih mengeksplor gitu. Jadi 'Oh, bagus ya Nak'. Diluar dugaan gitu. Saya ngajarinnya cuma biasa, ternyata ya namanya anak kan suka ngotak-ngatik gitu, lebih bagus dia. Bentuknya, segala macamnya ternyata lebih bagus. Terus mereka lebih ngerti jadinya dengan menggunakan itu."*
**(Teacher 1)**

*"Kalau misalkan membantu, iya sangat membantu. Cuma ga semua materi bisa menggunakan mind map ini. Jadi ketika kita pakai mind map, mereka secara runtut sejak dari awal. Misalkan saya comparative degree, comparative degree itu ada berapa,*

*ada tiga, gitu kan. Nah apa saja, kemudian pemakaiannya bagaimana, gitu. Itu otomatis mereka ketika itu dalam satu pembahasan, mereka jauh lebih gampang dalam mengingatnya juga gitu kan. Karena ada perbandingan disitu. Oh yang ini kayak gini, yang kedua kayak gini, yang ketiga kayak gini. Ada penambahan apa, ada perubahan apa, berbeda ketika kita kasih per-materi, satu-satu gitu mungkin mereka juga gampang lupa. Tiga sekaligus diberikan, itu jauh lebih efektif gitu, mereka jauh lebih bisa mengingatnya."*
**(Teacher 9)**

Respondents stated that digital mind maps can help the students connect ideas in reading (100%) and in listening (80%). See the interview results below.

*"Nah kalau mendengarkan kan jarang. Paling kalau dulu jaman di*

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*kelas, saya masih konvensional. Bawa recorder sendiri. Paling kayak teks sama grammar focusnya aja."*
**(Teacher 5)**

All respondents agreed that digital mind maps can help the students organize ideas for writing and speaking in a structured way. 90% of respondents believed that students can learn all English materials (reading, listening, speaking, writing, vocabulary, and grammar) by creating a digital mind map. All respondents believed that digital mind maps can improve the students' reading skills, writing skills, speaking skills, vocabulary mastery, grammar mastery, and communication skills, as also stated in the interview.

*"Kemampuan reading. Karena dia menarik dengan memakai media digital."*
**(Teacher 8)**

*"Kemampuan menulis dan berbicara."*
**(Teacher 7)**

*"Kemampuan berbicara ya. Dan mungkin juga kosakata, karena secara tidak langsung mereka juga menambah kosakata saat mereka belajar."*
**(Teacher 3)**

*"Membaca dan tata bahasa lah, bisa meningkat dengan itu. Karena pola kalimatnya mereka jadi paham gitu kan, jadi untuk membuat kalimat jauh lebih mudah."*
**(Teacher 9)**

On the other hand, 80 % of them (as shown in statement 10) believed that digital mind maps can improve the students' listening skills, implying that mind mapping gave less impact on the students listening learning output, compared to it did to other skills and knowledge.

In brief, teachers perceived that the digital mind map tools help them in teaching and their students in learning English in the classroom. They agreed that digital mind maps can facilitate students in comprehending the lesson because it is easier for students to remember important points that have been conveyed by the teachers. In fact, a teacher claimed that a digital mind map makes students more interested in understanding the subject matter because they can express all the ideas they have. The findings above are aligned with Buzan's (2009) claim that mind mapping helps users recall things better, take better notes, come up with brilliant ideas, organize their thoughts, and have more fun while learning.

The mentioned claims above became even more beneficial during the online sessions in the pandemic situation. Not only did it help material delivery and understanding in various genres in terms of reading, listening, speaking, writing, vocabulary, and grammar, but it was also valuable to help students connect their ideas, affecting their higher critical thinking, creativity, effective communication skills, ICT literacy, and other 21$^{st}$-century skills.

However, not all teachers asked their students to make a digital mind map which was mostly caused by the unavailability of compatible gadgets and limited access to the internet. The respondents also admitted that not all students submitted the mind mapping assignments.

**CONCLUSION**
To conclude, the teacher respondents have a positive perception of the use

of digital mind maps in English learning. It helps them facilitate students in remembering the important points and comprehending the lesson more easily. It also boosts the students' interest in the materials and willingness to express all the ideas they have. It also fits the materials in any genres, skills, and language focus. Thus, digital mind mapping in English lessons has shown promising perception for continuous use in the future learning process. Despite the challenges from the gadgets, internet connection, and ICT skills, digital mind maps are practical and accessible at ease.

Due to the study limitation, it is recommended that future researchers conduct further studies on a digital mind map at various levels or in a more specified text, skill, or language focus, involving more respondents, so that more valid results can be obtained.

Last but not least, English teachers are encouraged to try including digital mind mapping materials, activities, and tasks for better ICT literacy.

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