



The Effectiveness of Mnemonic Device Techniques in Improving Long-Term Memory in Learning in Elementary Schools: A Literature Review

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ARTICLE INFO	ABSTRACT
<p>Article history: Received 10 May 2023 Received in revised form 15 May 2023 Accepted 14 June 2023 Available online 30 June 2023</p> <p>Keywords : Mnemonic device, Long Term Memory, Effective Learning, Elementary School Students</p>	<p><i>In a variety of disciplines taught in elementary schools, which frequently need substantial memorizing, the use of mnemonic device techniques has shown to be helpful in facilitating learning and strengthening long-term memory. This study intends to investigate how well various mnemonic device techniques and their theoretical foundations work to improve long-term memory. A literature review methodology was used to create the accumulated findings by analyzing pertinent study results, journal articles, and literature reviews that covered the studied designs. The results of this study show that mnemonic device strategies can help primary school pupils improve their long-term memory. A variety of techniques are included in the mnemonic device techniques, including (1) rhyme, (2) abbreviations, (3) peg word system, (4) loci method, and (5) keyword system. Students can maximize their brains' encoding and retrieval processes, which will boost memory retention, by using the proper mnemonic strategy during the learning process. This helps students remember and retain the information they have learnt. In conclusion, using mnemonic device approaches in primary school instruction can greatly aid pupils in developing long-term memory. As they provide useful tools to aid the learning process and improve students' memory of crucial knowledge, educators and practitioners are encouraged to incorporate these strategies into their teaching practices. The use of mnemonic techniques by students can help them overcome the difficulties associated with memorization and improve their overall learning outcomes.</i></p>

1. INTRODUCTION

The acquisition of proficiency in multiple mnemonic strategies is highly advantageous for students. In academic settings, students are often required to commit certain concepts to memory within each respective subject. The ability of students to memorize is contingent upon several factors, including the duration of the concept, the degree of comprehension achieved by the students, and the methodologies employed. Comprehension is the primary determinant of student memorization. A proficient comprehension of the subject matter enables individuals to establish connections between newly acquired information and previously assimilated knowledge (e.g. Gianistika, 2020; Tri Pudji Astuti, 2019). The practice of utilizing a thorough comprehension of newly acquired information for the purpose of memorization is infrequently observed. Utilizing mnemonic devices is an effective approach for retaining recently acquired concepts.

The application of mnemonic devices is a valuable tool in facilitating the acquisition of factual information, particularly in the domains of social sciences and pedagogy. Mnemonics refer to a set of strategies or methodologies that aim to enhance memory retention by utilizing literary devices such as poems, auditory cues, acronyms, acrostics, or visual aids. Several mnemonic devices that can be utilized, such as the Loci method, Mark-word system, Keyword method, Linking method, Acronyms, Acrostics, and Rhymes and jingles (e.g. Areni et al., 2019; Lubin & Polloway, 2016; Mostafa & El Midany, 2017). The primary aims of mnemonic devices are twofold: firstly, to facilitate the retention of information pertaining to a specific location, individual, date, or other relevant concept by establishing connections and associations with related or proximate events; and secondly, to streamline the retrieval of previously acquired knowledge, thereby enabling its prompt recall as necessary. The process of transferring information from short-term memory to long-term memory can be achieved through various effective methods.

The retention of information in short-term memory is susceptible to decay or forgetting. This is attributed to the fact that the left hemisphere of the brain is solely responsible for the process of remembering. The brain is bifurcated into two physiological hemispheres, each of which is specialized in distinct cognitive functions (Molnar-Szakacs & Uddin, 2023). The following are distinctions between these cognitive processes.

Table 1. Functions of the Two Right and Left Brains

OTAK KIRI	OTAK KANAN
ANALITIS / AKADEMIS	KREATIF
Logika	Irama
Kata-kata	Musik
Angka	Gambar
Matematis	Imajinasi
Berpikir urutan	Konseptual
Rutinitas/Pengulangan	Berpikir Acak
Detail	Intuisi
Terorganisasi	Global/Menyeluruh
<i>STM (Short Term Memory)</i>	<i>LTM (Long Term Memory)</i>

The optimal functioning of the human brain is contingent upon achieving a balance between the left and right hemispheres (e.g. Leisman et al., 2022; Sollmann et al., 2017). This

represents the fundamental element of our exceptional memory capacity. Typically, individuals, particularly those residing in Indonesia, exhibit a preference for utilizing their left hemisphere predominantly, particularly in the context of memory recall. The aforementioned statement aligns with the findings of a study conducted at the Habibie Center, which revealed that merely three percent of individuals in Indonesia engage in right-brain activities. Consequently, the memory retention capacity tends to be weak or short-term, as per the characteristics of the left hemisphere, as illustrated in the aforementioned table. Utilizing mnemonic devices to engage the right hemisphere of the brain has been shown to facilitate the retention of information in long-term memory. This approach to memory recall involves activating the right brain, resulting in the storage of information in long-term memory, thereby facilitating ease of retrieval.

Numerous research endeavors are currently underway to explore novel techniques for enhancing long-term memory. This is a noteworthy observation as the utilization of a straightforward approach enables students to comprehend the concept with minimal exertion. The utilization of mnemonic devices is among the various techniques available. The mnemonic technique aims to condense the information or reduce the duration required for an individual to commit it to memory. The authors' research aims to investigate the efficacy of the mnemonic device technique in enhancing the long-term memory of primary school pupils.

2. METHOD

The present research employs a literature review approach to ascertain the efficacy of the mnemonic device strategy in enhancing the retention of information among primary school pupils over an extended period. The methodology employed for studying literature encompasses a comprehensive analysis of written works, including literature reviews, theoretical reviews, theoretical foundations, and literature-based investigations. The process of conducting a literature review is widely regarded as a rigorous, transparent, and replicable approach to discerning, assessing, and amalgamating scholarly literature and the perspectives of scholars.

This study employs the literature review methodology, which comprises four distinct stages. The initial phase under consideration pertains to topic selection, wherein the subject of interest is the efficacy of the mnemonic device approach in enhancing the enduring retention of information among primary school pupils. The subsequent phase involves the process of scrutinizing and handpicking pertinent articles, which is executed by drawing upon theories expounded in academic journals, scientific articles, and literature reviews that are germane to the research subject matter. The third phase of the research process involves the analysis and synthesis of literature, wherein the researcher scrutinizes the outcomes presented in the chosen articles. The final stage of the review process involves the compilation of the reviewed findings by the researcher.

To enhance this research methodology, various factors can be taken into account. It is imperative to ensure a methodical and comprehensive approach to the selection of articles. Furthermore, it is imperative to prioritize the caliber and originality of the chosen articles to ensure that the literature review encompasses the most recent scholarship. Moreover, during the examination and amalgamation of the scholarly works, the investigator may opt for a more systematic methodology, such as employing a particular framework or classifications of discoveries, to arrange the outcomes in a more methodical fashion. In the process of

compiling the outcomes of the analysis, scholars should prioritize the use of lucid, succinct, and methodical exposition to facilitate comprehension of the scrutinized discoveries by the audience. By taking into consideration these factors, a systematic and informative investigation can be conducted on the efficacy of mnemonic device techniques in enhancing the long-term memory of primary school pupils through the utilization of literature study methodology.

3. RESULTS AND DISCUSSIONS

The implementation of learning is subject to various factors that can impact the effectiveness of learning patterns and strategies, ultimately determining whether the desired learning outcomes are achieved. The factors that impact learning outcomes encompass various elements. Firstly, there is the raw input, which includes the conditions and capacities of students, such as their basic abilities, special talents, motivation, interests, maturity, readiness, attitudes, and habits. Secondly, there is the instrumental input, which refers to the infrastructure supporting learning, including teachers, methods and techniques employed, media used, learning materials and resources provided, as well as the design of learning programs. Thirdly, the environmental input encompasses the situational and contextual aspects of the learning environment. Lastly, the expected output refers to the normative formulation of what students should achieve as a result of engaging in the learning process (Nuzulia et al., 2020).

The effectiveness of mnemonic device techniques in enhancing the learning outcomes of elementary school students is further underscored by the practical implementation of mnemonic techniques in the curriculum. Mnemonic techniques can be seen as a cognitive system that aids in the retention of information, allowing individuals to remember desired content more effectively. The retention and recall of subject matter are facilitated by the effective encoding and storage of information in memory. Consequently, when the material is to be retrieved, the process is simplified as one only needs to access the mnemonic module and retrieve the associated memory codes. Information is stored in memory in a manner that facilitates easy retrieval. This is achieved by encoding the information into mnemonic modules, which consist of memory codes. When the information needs to be recalled, the mnemonic module is accessed, and the memory codes are retrieved, making the process of recalling the information straightforward (e.g. Areni et al., 2019; Esposito, 2016; Lubin & Polloway, 2016).

The application of mnemonic techniques in learning that is used during is the core of the process of understanding (encoding) and the process (storage) when someone learns or remembers an information obtained so that the material or information can be remembered properly, the mechanism of remembering in four stages, namely: 1) Registration, 2) Encoding, 3) Storage and 4) Retrieval. Whatever the principle of the mnemonic technique used, the technique is processed in human working memory (e.g. Esposito, 2016; Sollmann et al., 2017). Working memory and long term memory have a complementary relationship, both functionally and structurally (Soemer, 2016). Working memory allows us to be active “doing” and manipulating information while performing everyday tasks. Two of the four components of working memory are the Phonological loop and the Visuospatial sketchpad. Those are the parts that actively manage information to perform mnemonics.

Of the many principles of mnemonic techniques that have been described, meaning is an effective technique for recalling information in long-term memory. Meaningful events are

stored for a long time in memory. So if it is related to learning, students are expected to interpret what they want to learn, so that it is easy and durable to be stored in long term memory. This prevents forgetfulness when storing information.

The occurrence of forgetting can be attributed to two primary factors, specifically encoding failure and retrieval failure. Maximizing encoding and retrieval failures can be achieved through the utilization of an encoding process that aligns with the principles of long-term memory. The faculty of imagination enables individuals to perceive and comprehend information in a more expansive manner, thereby fostering a heightened capacity for creative interpretation. The cognitive faculty of imagination is facilitated by the cognitive process of linking novel information with preexisting knowledge. The organization facilitates the categorization of information, thereby enhancing its structure and facilitating its retention. The utilization of repetition has the potential to enhance the transmission of information, thereby facilitating its transfer to long-term memory. Repetition is a beneficial strategy for individuals to enhance their retention of information and reinforce the connections between concepts. Mnemonic techniques facilitate the establishment of cognitive connections, thereby enhancing the retrieval of information from long-term memory (e.g. Esposito, 2016; Guo, 2016).

The inability to recall information can be influenced by abnormalities occurring at one or multiple stages within the cognitive process of memory retention. The utilization of mnemonic techniques facilitates the cognitive process of memorization, thereby enhancing the acquisition of knowledge and proficiency in the learning process. The analysis undertaken on the utilization of mnemonic techniques in the learning of elementary school students yielded the finding that the implementation of mnemonic techniques proved to be an influential external factor, significantly impacting students' learning outcomes, as evidenced by the obtained research results (e.g. Esposito, 2016; Salim & Suryanto, 2017). There is a growing recognition that the utilization of mnemonic techniques, which facilitate independent learning and enhance elementary school students' proficiency in rote material, presents an alternative instructional approach for educators to diversify their teaching and learning methodologies.

4. CONCLUSION AND SUGGESTION

The article examines the efficacy of mnemonic device strategies in augmenting the retention of information in elementary school students over an extended period of time. The present study undertook a comprehensive literature review to examine pertinent scholarly investigations, academic articles, and literature reviews pertaining to mnemonic strategies and their influence on enhancing memory. The results suggest that the utilization of mnemonic device strategies, including rhyme, abbreviations, peg word system, loci method, and keyword system, can have a substantial positive impact on the long-term memory of elementary school students. Through the utilization of suitable mnemonic strategies during the process of learning, students have the ability to enhance the encoding and retrieval mechanisms of their cognitive faculties, thereby resulting in enhanced memory retention. These strategies facilitate the process of memory consolidation and knowledge retention among students. Therefore, the integration of mnemonic device strategies in primary school pedagogy yields significant advantages in the enhancement of students' long-term memory formation. The article concludes by suggesting that educators and practitioners should incorporate mnemonic techniques into their instructional methodologies. By engaging in this

practice, educators can offer valuable resources that support the process of learning and improve students' retention of crucial information. The utilization of mnemonic device techniques has the potential to assist students in overcoming the difficulties associated with memorization, thereby enhancing their overall learning outcomes.

ACKNOWLEDGMENTS

Thanks to all those who have helped in the preparation of this article.

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