

## The Processes of Memory, Forgetting, and Transfer and Their Implications in the Learning and Learning Process: A Literature Review

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### ABSTRACT

The issue of transfer of learning that emerges in the context of education cannot be separated from the problem of remembering and forgetting in learning. Teachers must genuinely anticipate these issues. Each student has unique traits, and they are all unique both physically and psychologically. The goal of this study is to investigate memory, forgetting, and transfer issues in the learning and learning process. It is implied that a teacher shouldn't apply a generalization to all students. A teacher needs to know how to relate to and comprehend his students. However, in practice, teachers have not given this issue their full focus in classrooms. Because teachers play such a crucial role in the entire teaching and learning process, improving the quality of teachers in the teaching and learning process is one of the efforts being made to improve the quality of education. Thus, the topics of memory, forgetting, and learning transfer will be covered in this study.

*Keywords: Memory, Forget, Transfer, Learning*



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### INTRODUCTION

Education is essentially a deliberate attempt to maximize pupils' human resources by supporting and assisting their academic endeavors (Kooli & Abadli, 2022). Professional educators are required in this situation to support pupils in achieving their learning objectives (Numonjonov, 2020). Teachers, in particular, need to have a wide range of necessary psychological understanding to carry out their vocation (Travers & Cooper, 2018).

It is important to keep in mind that every person has unique qualities and distinctions, both physically and psychologically (Hardy et al., 2018). It is implied that a teacher shouldn't apply a generalization to all students (Vahdat & Mazareian, 2020). A teacher needs to know how to relate to and comprehend his students. The teacher needs to have a solid understanding of memory and forgetting, which are common experiences for children.

The occurrences, challenges, and issues surrounding memory and forgetting in the context of learning are numerous. While most individuals only have a basic understanding of these concepts, their various applications and variants continue to be fraught with difficulty (Sampath et al., 2021).

As a result, educators cannot foresee memory and forgetting issues that pupils may experience (Bjork & Bjork, 2020). Utilizing the right learning objectives will result in something beneficial. The issue of "learning transfer" cannot be isolated from students' capacity to apply specific learning results to other learning contexts. As a result of its

ability to improve scientific knowledge of "cognitive structures," learning transfer is considered as having "strategic value" in education and training (Muskat & Zehrer, 2017).

Therefore, several measures must be taken to minimize forgetting after engaging in learning activities. Remember is the opposite of forgetting; if we remember something, it means we don't forget it, and the reverse is true if we don't.

## **METHODS**

The type of research used to study individual differences: learning styles, personality, and temperament, and their implications for learning review is a systematic literature review (SLR). Literature research methods to identify, review, evaluate and interpret all available research. (Leukel et al., 2022). The method of structured review and identification of journals follows a defined procedure for each process. Information is collected by reading literature related to the topic being discussed. Data sources, especially literature, can be in the form of books, scientific articles, research journals, research reports, seminar papers, and other forms related to this research. The resulting data source is an indexed journal published in the Google Scholar database.

## **RESULTS**

### **3.1 Memory in Learning and Learning**

#### **A. Meaning of Memory**

Memory or often called memory is a function of cognition that involves the brain in retrieving information. Memory will be studied in greater depth in cognitive psychology and neuroscience. In general, experts view memory as a relationship between experience and the past. What has been remembered is something that has been experienced, has been perceived, and this has been entered into his soul and stored, then at one time, the incident was brought back into consciousness. Memory is the ability to receive and enter (learning), store (retention) and bring back what has been experienced (remembering). Memory is the storage of information over time. Educational psychologists study how information is initially stored or encoded into memory, how information is stored after it has been encoded, and how information is retrieved or retrieved for specific purposes at a later time. The main part of this memory is focused on encoding, storing, and recalling. For memory to function, children must retrieve information, store or convey it, and then retrieve it for a specific purpose at a later date (Santrock, 2008). In simple terms, Irwanto (1999) defines memory as the ability to store information so that it can be used again in the future. Galotti (2004) defines memory as a cognitive process consisting of a series of processes, namely storage, retention, and information gathering. As a process, memory exhibits a dynamic mechanism associated with storing, retaining, and retrieving information about past experiences. Santrock (2008) defines memory as the retention of information that has been received through the stages of encoding, storage, and retrieval. This study uses the definition of memory according to Santrock, namely, information originating from the environment and this information will be processed through the stages of coding, storage, and recall so that the incoming information is not wasted.

## **B. Types of Memory**

Atkinson et al (1991) developed a stage of memory known as the Three-Stage Model of Memory which divides human memory into 3 main components, namely: 1) Sensory Memory, which is the process of storing memories through sensory nerves that last for a short time. Information obtained through the five senses (sight, touch, smell, hearing, and taste) can only last for 1 or 2 seconds. This statement is supported by Rathus (2007), who states that the first information we receive from the environment and is obtained through the five senses can only last 1 second. Information received by the sense of sight can only last a quarter of a second; 2) Short Term Memory, a process of temporarily storing memories. Short-term memory is also called working memory because the stored information is only retained as long as the information is still needed. If the information is not repeated within 30 seconds, then the information in short-term memory will disappear 3) Long Term memory A relatively permanent process of storing information (Santrock, 2008). Reed (2004) divides long-term memory into 3 types, namely: a) Procedural Memory, Memory of learned actions, skills, and operations, for example, the individual knows how to ride a bicycle even though he has not cycled for a long time. b) Semantic Memory, Memory that contains general knowledge about the meaning of something, for example, the individual knows the meaning of the word "fly". c) Episodic Memory, Memory of specific events and experiences, knowing when and where these events or experiences occurred, for example, the individual knows when and where he got married even though the incident has passed 20 years.

## **C. Remembering Stages**

Santrock (2008) states that there are 3 stages in the process of remembering, namely: 1) Coding, which is the process of converting information into certain symbols or waves that are by the rankings in the organism, among others; a) Coding in Sensory Memory. When you see something or your ears hear something, information from the senses will be converted into neural impulses and sent to certain parts of the brain. This process takes place in a fraction of a second; b) Coding in Short-Term Memory. Information that enters through the senses and is stored in sensory memory can be considered raw material in great abundance. The large number will be selected according to several ways in process control (control processes); c) Coding in Long Term Memory. Coding in long-term memory is divided into 2, namely declarative memory and procedural memory. Declarative memory is further divided into two, namely semantic memory and episodic memory; 2) Storage, information that has been changed will be maintained at the storage stage. Storage is a process of precipitating or storing information received in a certain place. This storage already includes the categorization of information so that the place where the information is stored is by category; and 3) Retrieval is a process of recalling, which is a process of searching for and finding information stored in memory to be reused when needed.

## **D. Process of Entering Information into the Human Memory System**

Information from outside first enters sensory memory, this sensory memory is very easily lost because of its small capacity. The senses that work to capture a lot of information will result in forgetfulness. Information that is considered relevant and important for individuals will be forwarded and entered into short-term memory. Short-term memory also has its capacity, which is about 30 seconds (Santrock, 2008) and if information that is considered relevant and important for this individual is not repeated then the information can be lost, or the information is forgotten. Information that manages to enter short-term memory will be forwarded to long-term memory, long-term memory is a relatively permanent repository of information (Lahey, 2003).

## **3.2 Forgetting in Learning Meaning**

### **A. Meaning of Forgetting**

Forgetting is the loss of the ability to recall or reproduce what we have previously learned. In simple terms, Syah (1999) define forgetting as the inability to recognize or remember something that has been learned or experienced. Forgetting is a very popular term in society. Every time someone must forget something, whether it's about events in the past or something that will be done (Syah, 1999). Forgetting is a very popular term in society. From day to day and even every time, there must be certain people who forget something, whether it's about events or events in the past or something that will be done, maybe also something that has just been done. Phenomena can happen to anyone, regardless of whether that person is a child, teenager, parent, teacher, official, professor, farmer, and so on (Djamarah, 2008).

The question of remembering and forgetting is usually also shown with only one meaning, namely retention because the two things are only looking at the same thing from a different perspective. Things that are remembered are things that are not forgotten, and things that are forgotten are things that are not remembered (Suryabrata, 2006). Forgetting is an event that cannot produce our responses, while our memory is healthy. Some interpret forgetting as a symptom in which information that has been stored cannot be retrieved for use (Irwanto, 2002). Syah (1999) in his book entitled educational psychology defines forgetting as a simple loss of the ability to recall or reproduce what we have previously learned. Syah (1999) define forgetting as the inability to recognize or remember something that has been experienced or learned, thus forgetting is not an event of loss of information and knowledge items from our minds.

### **B. Factors Causing Forgetting**

Several factors cause someone to forget. According to Shah, these factors are as follows: 1) Forgetting due to changes in environmental conditions, such as between studying at school and studying/recalling outside school; 2) Forgetting because of changes in attitudes and interests; 3) Forgetting due to changes in the nerves of the brain, and 4) Forgetting due to information corruption before entering memory. In addition, the causes of forgetting according to Winkel (1989); Djaramah (2002), namely: 1) Woodworth's view. The symptom of forgetting is caused by traces of memory that are not used so that over time they will be erased; 2) View of interference. Forgetting is caused by interference from information that has just entered memory against information that has been stored for a long time so that it seems as if the old information is shifted and then it is more difficult to remember; 3) Patterned views. There are certain reasons for everyone to judge something. Unpleasant events will be more easily erased and forgotten than pleasant ones.

### **C. How to Reduce Forgetting**

According to Winkel (1989); Djaramah (2002), how to reduce forgetting is as follows: 1) There is a strong motivation to learn (especially motivation that comes from within oneself); 2) Get the students' attention so that they are interested in the material being taught so that the material is easier to remember; 3) Students need to process the material properly and immediately; 4) Files that are stored in long-term memory so that they are updated by digging them out of memory, processing them again, and putting them back into memory; 5) The teacher gives directed questions so that students succeed in extracting information from their memory.

### **3.3 Transfer in Learning and Learning**

#### **A. Definition of Transfers**

Transfer in language which is commonly called the transfer of learning implies the transfer of skills learned from one situation to another (Reber 1988). Events of transfer of influence (transfer) as mentioned above generally or almost always have an impact, both positive and negative on the activities and learning outcomes of other subject matter or skills. Thus, transfers can be divided into two categories, namely positive transfers and negative transfers. According to the Theory of Identical Elements developed by E.L. Thorndike, positive transfer usually occurs when there are elements in common between the old material and the new material. For example, a student who has mastered mathematics will easily study statistics.

#### **B. Variety of Learning Transfers**

Syah (1999) by quoting the opinion of Robert M. Gagne put forward four kinds of learning transfer, namely: 1) Positive transfer is a transfer that has a good effect on further learning activities. Positive transfer can occur in a student if the teacher helps to learn in certain situations that make it easier for the student to learn in other situations; 2) Negative transfers are transfers that have a bad effect on further learning activities. Negative transfer can be experienced by a student if he learns in certain situations that have a detrimental effect on the skills/knowledge learned in other situations. Thus the influence of the skills or knowledge possessed by the students themselves has nothing to do with the difficulties faced by these students when learning other knowledge or skills; 3) Vertical transfers are transfers that have a good effect on learning activities and higher knowledge/skills. Vertical transfer can occur in a student if the lessons learned in certain situations help the student master higher or more complex knowledge/skills. For example, an elementary school student who has mastered the principles of addition and subtraction when he is in grade II will easily learn multiplication when he is in grade III. In this regard, mastery of class II material is a prerequisite for studying class III subject matter, and; 4) Lateral transfer arrangements are transfers that have a good effect on learning activities of equivalent knowledge/skills. Lateral transfer (to the side) can occur in a student if he can use the material he has learned to learn material of the same complexity in other situations. It can also be said that student learning outcomes can not only be used in a life context that is as complex as learning but can also be used in a more complex and competitive life context.

#### **C. Factors Affecting Transfer of Learning**

Factors that can influence the emergence of transfer of learning are as follows: 1) Level of Intelligence and attitude, these factors come from students and revolve around basic capacity issues (basic abilities), attitudes, students' interests, and so on. Basic capacity or basic ability is to help the emergence of transfer of learning. Clever children tend to have high transfers, and conversely, less intelligent children tend to have low (minimal) transfers. Because it can not retain any information that has been obtained in sufficient quantities. Besides that, the transfer does not occur automatically but occurs on purpose. Therefore, a deliberate attitude and effort in this direction will help transfer occur. This means that what is learned by students, can be used and practiced by the circumstances, where he is. Likewise, the teacher's attitude and students' efforts to carry out learning actions also affect the amount of learning; 2) The teacher's method of teaching. This factor comes from the teacher and revolves around mastery of preparation, visual aids, selection of materials, and so on. With the same material but different results, caused by differences

in the use of teaching methods. The results of using the discussion method will be different from those using the lecture method and will also be different from the results of using the question-and-answer method.

The relationship between one subject and another becomes an intermediary that can lead to transfer in learning. One subject that can be mastered can be used as a basis for mastering other relevant subjects, both the rules and principles. Mastery of Indonesian language subjects, for example, can be used to study English subjects, and vice versa. Mastery of certain letter-making skills can be transferred to certain other skills, can be transferred to other skills that are still within the scope of writing letters, and so on.

## CONCLUSIONS

Memory is information coded and recalled. Memory is something that forms human identity from other living things. Memory gives humans points of reference to the past, and predictions of the future. Forgetting is a very popular term in society. From day to day and even every time, there must be certain people who forget something, whether it's about events or events in the past or something that will be done, maybe also something that has just been done. And one more thing that is important in the world of education, namely: the transfer of learning. Transfer of learning is a phrase consisting of words, namely transfer and learn. The transfer is taken from English, namely "transfer" which means replacement, handover, and transfer. Learning is known as a series of physical and mental activities to obtain a change in behavior as a result of individual experiences in interaction with their environment which involves cognitive, affective, and psychomotor.

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