

FORGETTING: IMPLICATION FOR TEACHING AND LEARNING SITUATIONS

Ijanaku, M.O.

Abstract

This paper discussed the importance of memory in understanding and retaining new information, solving problems and remembering the past. Memory is an indication that learning has persisted overtime, capable of being recalled for use when in need. And when memory fails, forgetting sets in. forgetting is the loss of ability to retrieve learned materials from either the short-term memory or long-term memory. Some of the causes of forgetting are; decay and interference, memory distortion and brain damage. One of the implications of forgetting in teaching and learning processes is that teachers should have good knowledge of meta-cognition and teach students about it. This will help students develop their meta-cognition abilities and to learn to use strategies or plan for accomplishing learning goals effectively.

Introduction

Memory is essential in understanding and retaining new information, solving problems, planning for the future or remembering the past. Although its indispensability is often taken for granted until when it fails, when one is unable to retrieve information he needs at a particular moment, for instance, during examination.

Memory is our cognitive system (or systems), which is responsible for encoding, storing and retrieving information. A crucial aspect of memory is forgetting.

Forgetting

According to Gleitman (1996), the word forgetting is employed as a blanket term whenever memory fails. Child (1997), sees forgetting as the loss of ability to retrieve from either the Short-Term Memory or the Long-Term Memory. He further explains that, Forgotten does not necessarily mean gone forever, since the particular memory one is unable to retrieve at a particular moment, could return sometimes later.

Elliott (2000), defined forgetting as the loss of previously acquired material from memory. He opined that, it is a normal process and does not refer to an abnormal loss of memory, occasioned by aging, shock or brain injury.

Forgetting is the loss of ability to recall or recognize material that had been previously learned. The material is not immediately available when one tries to remember it. This loss of material or forgetting can either be total or partial, permanent or temporary, depending on the stage at which it took place, (Olasehinde - Williams, 2002).

However, forgetting simply means the loss of information from memory or inability to retrieve information from memory. Information or material can be lost from the memory stores in different ways. If a person does not quickly attend to the information in Sensory Memory. It would be lost and retrieval would be impossible. However, if the information is well rehearsed, it will be passed to the working memory and it is retained there. The information is further transferred to the long-term memory, if more attention and rehearsal is given to it. For materials or information in the short term memory and long term memory to be lost or irretrievable at a particular moment is a puzzle. This is the reason, psychologists tried to find out, by carrying out researches and postulating theories of forgetting.

Theories of Forgetting

The following are various postulated theories of forgetting, indicating sources or causes of forgetting.

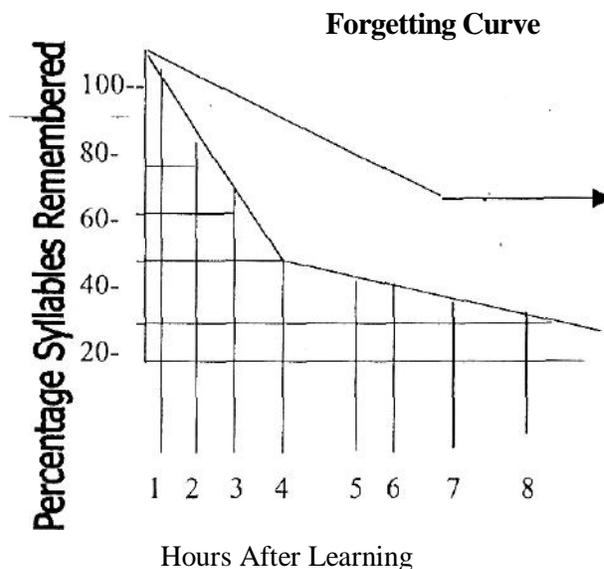
1. Decay Theory
2. Interference Theory
3. Memory Distortion
4. Retrieval Inhibition Or Retrieval failure Theory
5. Change Of Retrieval Cues
6. Motivated Or Repressed Forgetting

7. Brain Damage

Decay Theory

This is the earliest view of forgetting, that information in the Long Term Memory fades or decays with the passage of time (Baron, 2003). Decay theory means, memories gradually disappear with time. Some physiologists believe that, this is caused by some chemicals, which bring about some metabolic changes in the storage system. This brings with it the decay and finally, disappearance of memory traces, (Child, 1997).

Studies, however, indicate that the amount of forgetting is not simply a function of how much time has elapsed. That is, Retention Interval, but rather what happens during that period of time is crucial. For instance, Gleitman (1997), noticed that activities occurring between time of learning and testing also influence memory. This is because, the percentage of non-sense syllables, their subjects remembered decreased faster when they were awake than when they were asleep. In addition, in the geography class, students who are taught the topic "the vegetations of Nigeria" and they j later rehearsed, given tutorials, or assignments would perform better in the test that follows than the controlled group.



Adapted from Gletman (1997)

This forgetting curve shows that an hour after learning, most students can remember more than 90% of what they have learnt, whereas only 20% of the materials learnt can be remembered after 8 hours of learning.

Other studies indicated more interesting findings that recall sometime improves over time. That is, when people are given two successive tests, they almost always remember some material on the second test that they had forgotten on the first. This is known as reminiscences, which is difficult to account for by decay theory. Since the subjects ought to forget more of the material on the second test, because more time would have lapsed (Baron, 2003).

Therefore whenever teachers teach their subjects, students should be encouraged to explain what has been learnt to one-another or be told to repeat all the experiences during preparatory class for example in geography and chemistry.

The effect of the above contrasting view is that, psychologists reject the notion that forgetting stems from passive decay of memories over time (Baron, 2003). However, Cowan (1995), reports that the idea that decay causes forgetting from Short Term Memory is still current, but that it does not work for Long Term Memory. Interference Theory

Interference refers to the obstruction of recall that memories sometimes cause for one another (Roediger et al, 1999). According to interference theory, a forgotten memory is neither lost nor damaged, but it is only misplaced among a number of other memories that interfere with the recovery of the one that was sought (Gleitman, 1996). Schunk (1996), pointed out that forgetting results from interference, in which, there is loss of information because something else learned either before or after, detracts from the learning.

Interference is thought to be the most problematic of all sources of memory loss. It arises when materials being retrieved from the memory have similar, but unidentical features. For instance, if a student has learnt a song very well and not long after, he also learnt another song with a similar tune but different words. Therefore, in trying to sing the first song some words of the second song may come up, or in trying to sing the second song some words of the first song may come up, these are interferences.

Types of Interference

There are two basic types of interference, they are:

1. Retroactive interference, also called retroactive inhibition.
2. Proactive interference, also called proactive inhibition.

Retroactive Interference

This happens, when new learning interferes with the retrieval of old learning. For instance, in a typical study, a control group learned some rote material, such as a list of nonsense syllables (List A) while the experimental group learned the same list A, and another list B during the retention interval. Both groups were later tested on list A, after the same retention interval. The experimental group recalled less than the control group, because the interpolated list (B) interfered with (or inhibited) the recall of list A (Gleitman, 1996). Retroactive Inhibition Experiment

	Initial period	Retention Interval	Test period
Control Group	Learns List A	-	Recalls List A
Experimental Group	Learns List A	Learns List B	Recalls List A

Proactive Interference

Here, interference works in a forward (Proactive) direction, as older learning interferes with the capacity or ability to retrieve more recently learned material (Spencer, 1996).

Underwood (1957), exemplified proactive interference in an experiment. In which the experimental group studied lists A and B, while control group studied only list B. after retention interval, both were tested on list B and experimental group did worse on the recall test.

Proactive Inhibition Experiment

	Initial period		Retention Interval	Test period
Control Group		Learns List B	-	Recalls List A
Experimental Group	Learns List A	Learns List B	-	Recalls List A

As much as possible, learning of synonymous materials must be distinguished to bring out the similarities and differences, to avoid the confusions of interference.

Memory Distortion

This theory offers that information entered or store into the memory is often altered in various ways over time and these alterations can reduce its accuracy and change its meaning (Baron, 2003).

This is because; sometimes traces made by a new material in the brain may not decay altogether. Its long-term disuse may, however, lead to distortion of the trace. So that the material stored may not be retrieved exactly, as it was stored in the memory. Hence, what is retrieved becomes different from what was stored, (Olasehinde - Williams, 2002). Baron (2003), points out that changes that happen to information stored in memory, can take many forms, but most falls under two major types, they are;

- (i) Memory distortion, which refers to alterations in what is retained and later recalled,
- (ii) Memory construction, which refers to the addition of information that was not actually present. These could be seen in the

following studies.

About sixty years ago some experiments on memory distortion were carried out by Frederic Bartlett, a British psychologist. His subjects were asked to reproduce stories taken from the folklore of other countries. So that their content and structure were rather strange to Western ears. The reproduction showed many

changes from the original. Some parts were subtracted; others were over elaborated, while others were additions that were completely new (Gleitman, 1996). Furthermore, when the geography students commit to memory the names of the rivers of Nigeria, they will expect themselves to reproduce it when necessary. But when they learn the names of the rivers of Africa as a whole, their would be subtractions and or additions during the reproduction because of the distortions in the memory.

Baron (2003), shows that distortion in memory can also occur in response to false or misleading information provided by others. That is, if someone else's comment suggests a fact or detail that is not present in an individual's memories, he may add that fact or detail (Loftus, 1992, cited in Baron, 2003).

For instance, in Bartlett's study, of stories taken from the folklore of other countries the subjects built a new story upon the memorial ruins of the original. But the memorial reconstruction was generally more consonant with the cultural conceptions of the subjects that with the story they had actually heard. For example, the distortion in the stories is as a result of subjects cultures and their understanding of the folklores. Students should be allowed to use their own ideas of creativity in any lesson learnt by them.

Another important cause of distortion in memory is motives. People often distort their memories in order to bring them in line with whatever goals, they are currently seeking. For instance, if an individual likes a person, he wants to remember positive information about him or her and vice versa. In addition, students whose family occupation is fishing will develop much interest when a topic on fishing is discussed in the class.

Memories can also be distorted through confusions concerning the source of information in memory. This is called Source Monitoring, it is the process of identifying the origins of specific memories. That is the information is retrieved from the memory, but there is forgetting in form of distortion concerning the source of the information. For instance, one may recall the quotation 'Quitters never win', but attribute it to someone who did not say it. Or remember he read it in one specific book when he actually read it in another (Baron, 2003). And to many geography students, studying landforms are confusing because one can exchange the name of one landform for another for example self or bachan

Retrieval Inhibition or Retrieval Failure Theory

The basic assumption here is that, forgetting is caused by inability to access information that is represented in memory. This theory views the act of retrieval itself, as the cause of forgetting, not of the information that the person recalled but of other related ones that he did not try to recall. Most students of History tend to forget the chocks and balances of the system of administration in Oyo Empire because of the modern day democratic bottleneck administrative structures of the Local Government Areas, States and the Federal Government in Nigeria, because the cue of remembering (he former is not available.

That is when an individual attempts to remember information in the memory, he recalls the items he seeks but at the same time generated inhibition of other related items that he do not try to remember. As a result, these other unretrieved items become more difficult to remember in the future (Baron, 2003).

Change of Retrieval Cues

This theory is a further alternative to forgetting. It argues that memorial success or failure is primarily determined by the retrieval cues present at the time of recall. A change in retrieval cues can disrupt remembering. Certain memories acquired in a particular locality may be difficult to retrieve in another. This is because such is not relevant in the new locality. In the study of geography, a student tends to understand and gives it a meaning and remembers much of what he was taught but if he goes to read pure Education at the Tertiary Institution, he tends to forget several names in geography, because his attention and concentration or retrieval cues is not on geography but on education. Thus, some authors appealed to the retrieval cue hypothesis or cue alteration to explain the phenomenon of childhood amnesia. The fact that most people cannot recall events of their very early childhood, which could be, because the appropriate retrieval context is absent from the adults' environment.

Since learning takes place by integrating new materials into existing ones in an organized way, to remember, we often have to search our memory with the help of cues that point the way to the desired material (Olasehinde- Williams, 2002).

When appropriate cue is missing, the 'Tip of the Tongue' may occur, because trying to pluck a memory from the huge storage in the brain needs some guidance or cue. This explains while it is easier to recognize than recall information. Because in recognizing something, what is provided acts as cue to finding

the remaining part of the information.

Motivated or Repressed Forgetting

Spencer (1996), defined repression as conscious process of burying unpleasant memories, to protect the ego. However, common contemporary definition of repression is (hat, it involves both conscious and unconscious process of forgetting traumatic experiences. Repressed or motivated forgetting refers to an individual's deliberate effort not to remember an information or event. That is, the material or event is not recalled because one chooses to forget it. This is to protect one from the pain, unpleasantness, guilt or anxiety such a memory could produce. Hence, forgetting here is intentional and not due to interference or distortion (Olasehindc - Williams 2002). A student who has failed geomorphology three times in the tertiary institution, and therefore could not study geography in the university will repress the memory of his inability to study geography.

Brain Damage

Various kinds of damage to the brain can cause drastic defects in memory or disordered memories (Gleitman, 1996). This is because injury to the brain, if severe, can cause a disruption of the proper level of chemical required in the formation of memories (McGaugh, 1974, cited in Eggen and Kauchak (1999). When the stock to the brain is great, it can dislodge most of the memory work that is going on at the time of injury, erasing part of the memory for immediate and sometimes past information. One possibility is that damage to some .brain structures, prevent consolidation of memories that is memories are formed but are not converted to a lasting state (Squire, 1995, cited" in Baron, 2003).

Another is Baron (2003), Amnesia is loss of memory stemming from accidents that damage the brain or from, illness, injury, drug-abuse, operations performed to treat medical disorders of other causes. Two major types exist, they are;

Retrograde Amnesia: This refers to loss of memory of events that occurred prior to an amnesia inducing events. This could be for days, weeks, months or years. People forget things that happened to them in the past.

Anterograde Amnesia: This deals with memory lapses of events following the period of amnesia . inducing event, because of inability to store information in the Long Term Memory. Amnesia is also displayed by people who suffer from Korsakoff s syndrome, a disease that afflicts long-term alcoholics who have also has an impaired diet, resulting in thiamine deficiency. They display a strange array of symptoms, such as having hallucinations, repeating questions after they have being told the-answer- and repeating the same story over and over. Students who suffer from any. form of illness will not adjust to learning. Thus, such illnesses or diseases make them to forget whatever materials they have learnt. Hence teachers owe it a duty to cater for the health needs of each student for effective learning.

All forms of memories arc disturbed and even worse is the fact that, victims are often aware, that they are losing their memories and experiencing other effects of this illness (Baron, 2003).

Implications of Forgetting In Teaching/Learning Situation

1. Forgetting is a very real part of people's everyday lives and an important, factor in school learning. It could influence student's academic achievements promotion or placement. Hence, measures or strategies that will reduce forgetting and enhance remembering should be embraced.

We have seen that, interference is a function of similarity of tasks A and B and their closeness in time. To reduce, interference therefore, closely related ideas should be taught together. For example, adjective and adverb phrases, longitude and latitude, map reduction and enlargement. Their relationship in terms of similarities and differences should be highlighted and emphasized. This will take care of areas that can easily be confused (Eggen and Kauchak, 1999).

3. Teachers have a primary responsibility of facilitating students memory by paying close attention to all variables that affect memory. Teachers should therefore organize his lecturers to proceed from known to the unknown.
4. Faulty encoding could lead lo forgetting, so teachers should ask questions about the topics taught to ascertain, that learners encoded the right thing.
5. Teachers should have good knowledge of meta-cognition as well as teach students about it. This will help students develop their meta-cognitive abilities and to learn to use strategies or plans for accomplishing learning goals effectively when teaching some topics in geography

- real objects or improvised materials should be used to make students understand.
6. Some students do not realized that they can influence the learning process. Hence, learners need to know that if they pay more attention to important information and ignores distractions, they would learn better.
 7. Appropriate cues should be used to aid learner's understanding and recall of learning materials, such as assignments, projects and tutorials.
 8. Students should be given adequate rest after school learning, to consolidate learning materials and to help in future retrieval of such material. Meaningful and purposeful material, relevant to students need ad age should be preferred as they tends to be more memorable than meaningless and irrelevant ones.
 9. Students should be allowed and encouraged to participate actively during learning.

Conclusion

Although occasional failures of memories have significant effects in various spheres of life. For instance, it could lead to failure in an examination or misunderstanding in interpersonal relation; Yet, it might actually be preferable to having a perfect memory. Consider, for instance, the case of a man who had total recall After reading passages of the Divine Comedy in Italian, a language he did not speak, he was able to repeat them from memory some 15 years later. He could memorize lists of fifty unrelated words and recall them at will more than a decade later. He" could even repeat the same list of words backward, if asked (Feldman, 1997).

The problem this skill presented is that his memory became a jumble of lists of words, numbers and names. When he tried to relax, his mind was filled with images. Reading became difficult because every word evoked a flood of thoughts from the past that interfered with his ability to understand what he was reading.

Intact memories, though with occasional failures might be preferable to the above. Yet conscious effort to minimize such failure could be done through encoding strategies, such as, interest, mental imagery, verbalization and organization. Storage strategies, like making learning materials meaningful, over learning and consolidation theory (or rest) could also be used.

References

- Baron, A.R. (2003). *Psychology*. New Delhi: Prentice - Hall.
- Child .D. (1997). *Psychology and the teacher* (^ edition). London: Continuum, the Tower Building. Cowan,
- W, M. (1995). *The development of the brain*. Scientific America
- Dennis .C. (1997) *Psychology and the teacher*. London: Holt, Rinehart and Winston. Eggen, P
- and Kauchak, D, (1999). *Educational psychology*. New Jersey: Prentice - Hall.
- Elliot, N.S.; Kratochwill, R.J.; Cook, L.J. and Travers, F.J, (2000). *Educational psychology*. Boston: McGraw Hill.
- Feldman, S.R. (1997). *Essential of Understanding Psychology*. New York: McGraw-Hill.
- Gleitman, H. (1996). *Basic Psychology*. New York:~W.W. Norton Company
- Jenkins, J.G, and Dallenback, K.M. (1924). *Obliviscence during sleep and waking*. *American Journal of Psychology*. Vol35, 605-612.
- Olasehinde - Williams, F.A.O. (2002). *Memory*. In Jimoh, S.A. (2002). *Psychology of learning*. Ilorin: INDEMAC (Nig. Ltd.) Publishers.

Roediger, H.L; Capaldi E.D, Paris S.G; Polivy, J. and Herman, C.P. (1996). *Psychology*. Los Angeles; West Publishing Company.

Schunk, R, (1996). *Infants, amnesia and dissociable memory systems*. New York: Plenum Press.

Spencer, A.R. (1996). *Psychology in the new millennium*. Fort Worth: Harcourt Brace College Publishers.

Minami, H. and Dallenbach, K.M. (1946). *The effect of activity upon learning and retention in the cockroach*. *American Journal of Psychology*. 59. 1-58.