Course Design and Content Organization

A Psychological Perspective

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Effectiveness of Learning Material

The effectiveness of a learning material is guided by three primary factors:

- Comprehension
- Retention
- Recollection

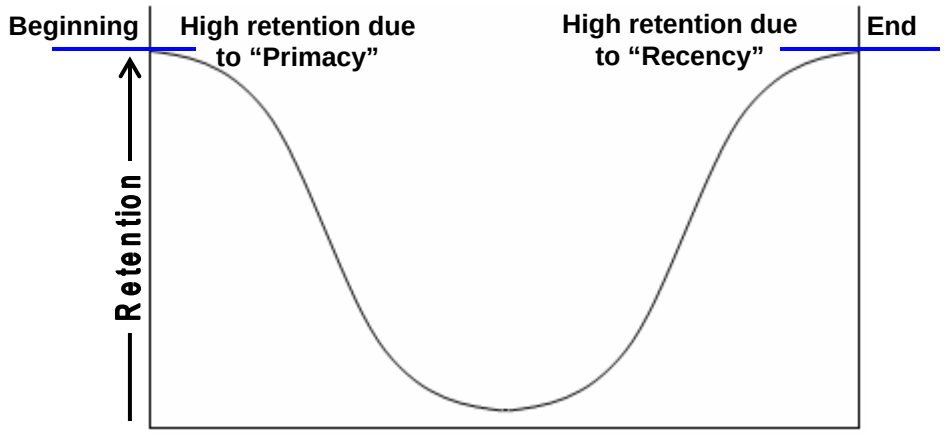
Comprehension of the content is governed by factors such as presentation, relevance, and difficulty level of the content. The comprehension of the content is the effectiveness of the content itself.

On the other hand, retention and recollection are governed, partly by the effectiveness of the structure of the learning material and partly by the individual memory of the learner.

While a lot of effort is spent on designing an effective structure of the course, individual memory is seemingly the more untouched and somehow neglected aspect of our efforts to develop effective learning solutions. There is a need to add a psychological perspective of memory and retention/recollection to the way we design learning solutions.

Psychological Perspective of Learning

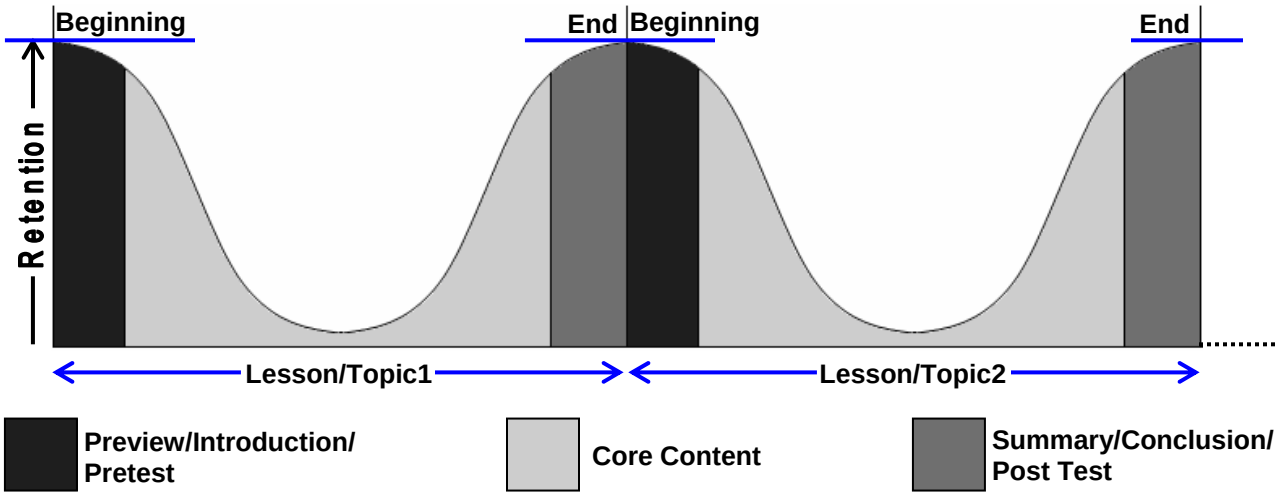
Several psychoanalytical studies have been conducted in the past to understand the process of learning and retention. One such study, the Serial Position Effect Theory, attempts to describe the phenomenon of retention and decay of memory. The study postulates the effects of “primacy” and “recency” on the retention of information in the memory and similar patterns are observed across all samples of the test population. The theory states that the information presented first and the information presented most recently are more likely to be retained in the memory than the information presented in between. The study was conducted by presenting a list of 30 words to the participants who were asked to memorize the words in the list. After a reasonable learning time, participants were asked to recall the words in the list. The results showed that the participants were best able to recall the words at the beginning and the end of the list. The words in the middle of the list were mostly forgotten by the participants. On further analysis, it was found that the Short Term Memory of the participants, which is responsible for immediate learning and recall of information, retained 7 ± 2 words from the beginning and the end of the list. The study concluded that retention is maximum at the beginning, tends to diminish in the middle, and again reaches a high towards the end. Graphically, this phenomenon can be represented by the following waveform:



Other studies on learning patterns have also conclusively proved that learning is affected to a great extent by the ability to retain information in Short Term Memory and the transfer of information from Short Term Memory to Long Term Memory. Moreover, repetition of information facilitates retention by transferring information from Short Term Memory to Long Term Memory.

Typical Course Designs versus the Psychological Perspective

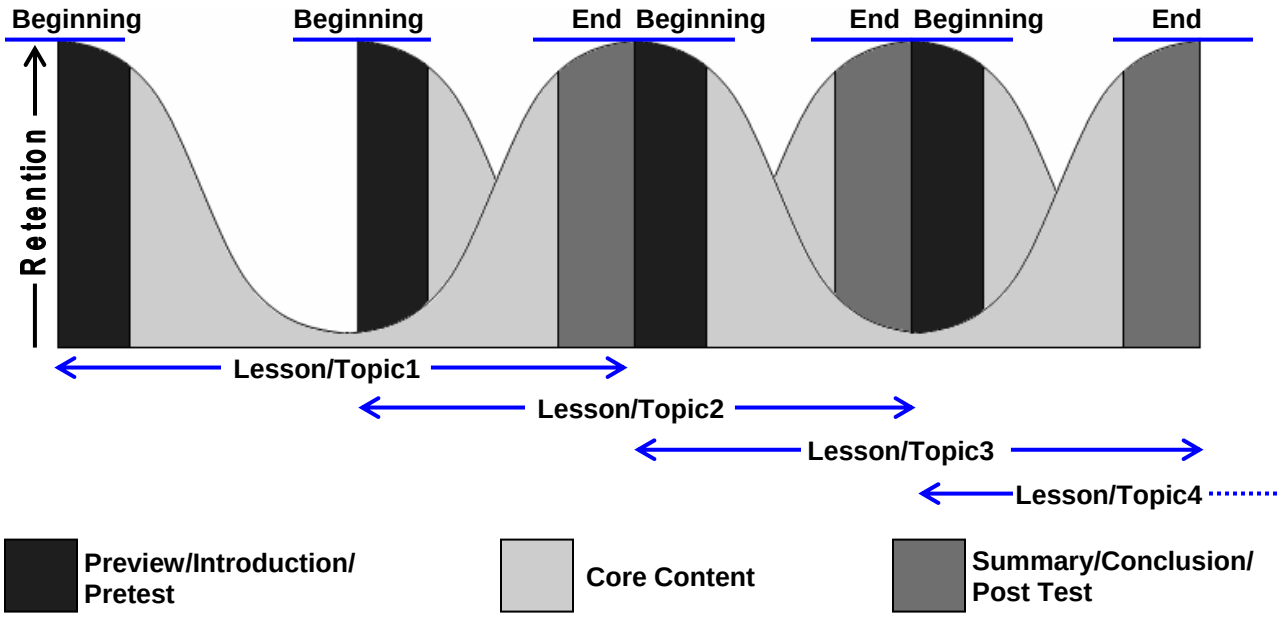
In the light of the above psychoanalytical studies, let's look at the way we typically design courses. The commonly used techniques of designing courses, such as Summary/Preview structure of courses, avoiding repetitive content, putting all the related information together, and so on, overlook the psychological barriers of learning and retaining information, as discussed above. What the learner will learn in a learning unit and what the learner learnt in a learning unit is emphasized at the beginning (Preview) and at the end (Summary). The core content always comes somewhere in the middle of the lesson or topic. Moreover, the effort to include all the related information about a topic in one lesson or module results in large sized lessons and topics. Overlapping content and repetition of content is also diligently avoided and removed. This approach can be depicted by the following waveform:



The core content loses focus somewhere in the middle. Moreover, while the studies indicate that repetition facilitates learning by the transfer of information from Short Term Memory to Long Term Memory, repetitive content is consciously avoided in the courses. An alignment of approach is required between the typical course designing strategies and the psychological perspective of memory and learning.

In any form, a learning material will always be subject to the phenomenon of "primacy" and "recency". Content that appears at the beginning and at the end of a learning entity is better retained than the content in the middle. The courses should be designed in a way that minimizes this phenomenon. A possible solution is to have a design that generates overlapping learning waveforms.

Looking at the learning waveform shown above, it is evident that the retention (and hence learning) is minimized towards the middle of a learning entity. To counter this effect, the learning curve needs to be pulled up at the middle. This can be achieved by designing the courses in such a way so that every new learning unit starts somewhere from the middle of the previous learning unit. In this case, the learning waveform will look somewhat like this:



This approach however has another challenge. A lot of repetition will be required if each new learning unit begins somewhere from the middle of the previous learning unit. Consequently, the course size will increase significantly. However, it should be remembered that repetitive content can also be advantageous because it facilitates retention. In effect, this approach has an inherent conflict.

Bringing the Psychological Perspective to Course Design

Human brain has the innate ability to create logical connections between related parts to draw the bigger picture (derived from *Gestalt Theory*). A possible solution that can address our problem is to design learning units in the form of knowledge objects. These knowledge objects should be small enough to avoid the effects of "primacy" and "recency", and big enough to encapsulate a stable and standalone content that is not repetitive across other knowledge objects. The focus should also be on providing the opportunity for the learner to create logical connections between these knowledge objects. This can be achieved by organizing the main content in small and very focused knowledge objects that are although independent but not isolated from the main content. Driven by the overall goal of the content, this approach leads the learner to a reasonable prediction of the learning that can be derived by going through the knowledge objects. However, it becomes important to verify the learners' progress and predicted learning during the transitions from one learning object to the other. This can be achieved by having interesting and engaging practice scenarios at critical intervals, which typically would be during the transitions between knowledge objects. These scenarios act as the connecting thread across the course and can bridge the gap between the knowledge objects. The scenarios can be direct or indirect and should be designed such that the responses to the given scenarios are derived from the previous as well as the current knowledge object. This kind of approach will not only enforce repetition of the content (only in the learners' mind), thus enhancing retention, but also encourage the learners to think creatively and make/express meaningful connections between the knowledge objects. It should also be emphasized here that, for any course to be successful, learners' engagement is more critical than learners' ability.

Future Trends

It is also apt at this point to discuss how technological advancements will drive the way we need to design courses. Communication devices are becoming more and more powerful and mobile. The rapid transition from desktop computers to laptops and palmtops and ever-increasing features of devices like PDAs and mobile phones are precursor to the technology that will facilitate hosting of courses on hand-held communication devices. The very fact that the communication devices are becoming smaller in size is indicative of the shrinking screen space for the content. This calls for an alignment of content organization/presentation with the technological advancements. Lesser screen size, bandwidth issues, and memory requirements for hosting and storage of content will be some of the critical issues that will have to be accounted for during content creation and presentation. However, it is encouraging to understand that the limitations that arise due to the shrinking screen space of the new communication devices – that is, the reduced space for the amount of content per screen – can be aligned with the solution suggested in the light of the psychological perspective of learning discussed above. That is, these studies indicate that the learning content should be organized in small and standalone

(but not isolated) knowledge objects, which make the content more suitable for retention, less liable to the effects of "primacy" and "recency", and encourage active engagement of the learners' mind, thus promoting overall learning. At the same time, new communication devices have (and will have) lesser than usual screen space, which will enforce the learning content that will appear on them to be in the form of small and standalone knowledge objects. To make the content suitably accessible and optimized for effective learning for the newer and smaller communication devices, learning units will have to be aggressively downsized and rearranged to make small and standalone (yet logically interdependent) knowledge objects that instigate the innate ability of the human mind to build connectivity across learning units and think actively to draw the learning.

About the Author

Atul Singh is a Technical Writer and Instructional Designer with about six years of experience in the field of technical documentation and development of training courses (CBT/WBT and ILT) for a wide variety of audiences. Presently, he is working as a Lead Technical Writer with Atrenta India Pvt. Ltd. He can be contacted at atul_sing@yahoo.com.

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