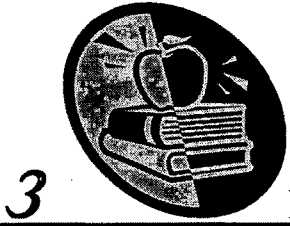


MODULE 3

INFORMATION PROCESSING SKILL

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INFORMATION PROCESSING SKILL

3.1 LEARNING OBJECTIVES:

As you learn through this module, you will be able to:

- Know how the brain processes information
- Use three different strategies to process information while you read
- Use KWL strategy to improve your reading comprehension
- Learn how to fully absorb information using SQ3R Technique
- Learn to speed read a text
- Learn in a way that suits you by knowing the various learning style

3.2 INTRODUCTION

The following module presents a simplified explanation of how the brain deals with information using the Information Processing Model and shows various techniques to improve your information processing skill. Further in this chapter you will be introduced to some skills for comprehension and speed reading which are very important for improving your reading skill which is an important aspect of information processing. The mastery of these skills with regular practice will not only improve the quality of your learning but will also help you learn quickly with ease.

3.3 THE INFORMATION PROCESSING MODEL

To understand the benefits of using various techniques to improve learning, it is important to know how our brain processes the information it gets from its surrounding and ultimately stores it in the long term memory. This can be explained in a simplified manner using the Information processing model. According to this model there are mainly three types of memory which are as follows:

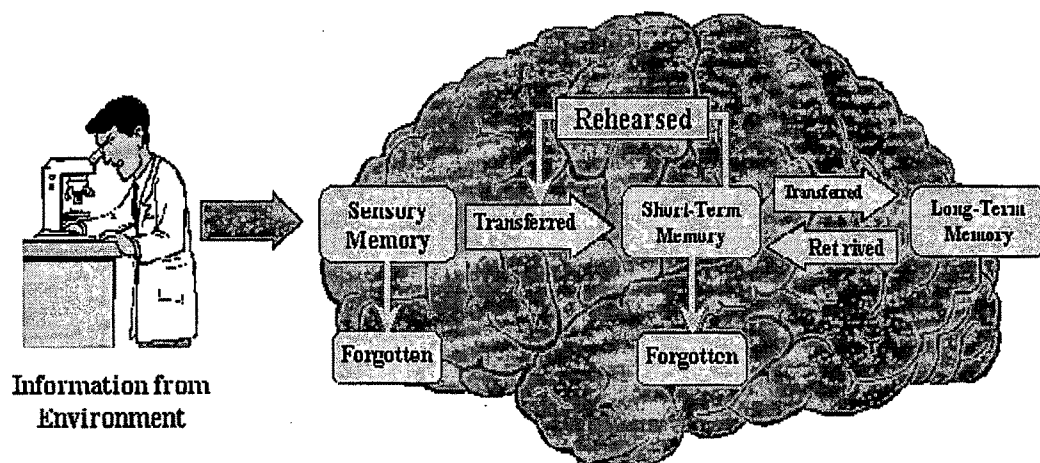
- Sensory Memory
- Short Term Memory
- Long Term Memory

Sensory Memory

Information from the environment enters our brain and reaches the sensory memory through our five senses viz. sight, hearing, smell, touch and taste. The sensory memory filters this information in just milliseconds using our past experience to determine the data's degree of importance. If the data signals are found unimportant they are dropped out of the processing system while the remaining information enters short term memory.

Short Term Memory

Short Term Memory is a place where conscious processing of information takes place. The information processing model represents it as a place of limited capacity where we can build, take apart, or rework ideas for eventual storage somewhere else. Information in the short term memory can come from the sensory memories or be retrieved from long term memory. According to this model, without a conscious effort to work with the recently received information we forget 82% of the information within 24 hours and almost all of it within a few days. The advantage of this process is that it helps us to avoid being overloaded with too much irrelevant information. The disadvantage is that the short term memory may also discard important information thinking that it is irrelevant.



Source: <http://nwlink.com/~Donclark/hrd/learning/memory.html>

Long Term Memory

Information having strong emotional impact and information that we want to remember are usually transferred from our short term memory to our Long term memory. This is how we remember many of our childhood memories and whatever we learn in school or college. Long term memory contains tremendous amount of

information that was acquired through years and years of formal or informal education.

3.4 TRANSFER OF INFORMATION FROM SHORT TERM MEMORY TO LONG TERM MEMORY

According to the Information processing theory information is most easily transferred to long term memory if there is a strong emotional association or if it is strange or unique, or if the information is associated with some of our critical needs.

The other way to transfer information to long term memory is to repeat information so that slowly and gradually it is transferred to long term memory. This implies that if we do not revise enough times much of our hard work will be wasted.

(3-3) TEST YOURSELF

- Q.1. Name the three types of memory according to the information processing model.
- Q.2. Information in the short term memory can come from the _____ or be retrieved from _____ memory.
- Q.3. Which type of information is most easily transferred to the long term memory?
-

3.5 READING INVENTORY

Most of the information processing is done through reading which is a complex activity. Like most other learned activity reading is an integration of a number of important skills. To become more aware of your present reading habits and attitude answer the following questions. There are no "right" or "wrong" answers. There is no score. The inventory is meant to increase your awareness.

A. Your reading habits

1. In general, how well do you think you read?
-- Very well ---Well ---Average ---Poorly ---Very poorly
2. How fast do you think you read?
---Very fast ---Fast ---Average ---Slowly ---Very slowly
3. How according to you is your vocabulary in English?
---Excellent ---Good ---Poor

B. Problems you may face in Reading

	Often	Sometimes	Rarely
1. Do you often have to reread material in order to understand it?	-----	-----	-----
2. Do you find it hard to concentrate?	-----	-----	-----
3. Do you have difficulty in recalling to mind what you have read, after a week?	-----	-----	-----
4. Do you feel worried after you have read, whether you have got all the main points?	-----	-----	-----

C. How much reading do you do?

	Hours per week
1. Newspapers	-----
2. Magazines	-----
3. Journals	-----
4. Fiction	-----
5. Non fiction	-----

D. Your attitude towards reading

1. Do you enjoy reading? -----
2. What type of reading do you like and what type do you dislike?

3. Did you enjoy any particular book in the last few months?

4. Are you an active reader? That is, do you make notes, read critically, look up unfamiliar words or facts.

5. In general, do you think reading is important to you? How do you propose to better your reading ability?

Adapted from: Lewis, H (1985). *How to study*, Gujrat Sahitya Prakashan, India.

The section that follows will show you how to use three different strategies to read intelligently.

3.6 STRATEGIES FOR IMPROVING YOUR READING SKILL

Strategy 1: *Knowing what you want to know*

Before starting to read a book or long article that is connected with your studies the first thing to ask yourself is:

1. Why you are reading the text?

Reasons for reading:

- a) to get a general idea of what a particular subject is all about
- b) to pass time
- c) to keep up-to-date with what is happening in the world
- d) to find some information that might be useful for an essay
- e) because the book is on the course booklist

2. What do you want to know after reading it?

Once you know the answers to the above two questions, you can examine the text to see whether it is going to move you towards this goal. An easy way of doing this is to look at the introduction and the chapter headings. The introduction should let you know whom the book is targeted at, and what it seeks to achieve. Chapter heading will give you an overall view of the structure of the subject. Ask yourself whether the book meets your needs. Ask yourself if it assumes too much or too little knowledge. If the book isn't ideal, would it be better to find a better one?

Strategy 2: *Knowing how deeply to study the material*

a. If you only need the shallowest knowledge of the subject, you can **skim** the material. Here you read only chapter headings, introductions and summaries.

b. If you need a moderate level of information on a subject, then you can **scan** the text. Here you read the chapter introductions and summaries in detail. You may then speed read the contents of the chapters, picking out and understanding key words and concepts. At this level of looking at the document it is worth paying attention to diagrams and graphs.

c. Only when you need detailed knowledge of a subject it is worth **studying** the text. Here it is best to skim the material first to get an overview of the subject. This gives you an understanding of its structure, into which you can fit the detail gained from a

full, receptive reading of the material. SQ3R is a good technique for getting a deep understanding of a text. You shall learn about this technique in a later section of this module.

Strategy 3: Active reading

When you are reading a document in detail, it often helps if you **highlight**, **underline** and annotate it as you go on. This emphasizes information in your mind, and helps you to review important points later. Doing this also helps to keep your mind focused on the material and stops its wandering. Often pointing the fingers to the words being read establishes a smooth rhythmical habit. The reader is not restricted to the use of his forefinger as a visual aid and can use to advantage a pen or a pencil. The visual aid will make the reading speed faster.

In the next section we shall learn about two techniques viz. KWL technique and SQ3R technique for improving your reading comprehension.

(3-6) TEST YOURSELF

- Q.1. Name the three strategies for improving your reading skill.
- Q.2. When you read only chapter headings, introductions and summaries you _____ the material.
- Q.3. What does scanning a text imply?

- Q.4. While reading you may use your _____ or a _____ as a visual aid to make the reading faster and establish a smooth rhythmical habit.

3.7 KWL strategy

KWL is a learning strategy which is particularly useful for improving your reading comprehension. It is very useful when you are reading to learn a topic. This technique ties together your prior knowledge, your desire to learn more, and the conclusions of your learning.

The acronym KWL stands for the three sequential techniques you may use while reading a text or a book.

K----- Know, W----- Want to know, L----- Learned

How to use the tool?

- 1. Draw a KWL chart as shown below.

KWL		
What I Know	What I Want to Know	What I Learned

- 2. In the first column list everything you know about the topic of study.
- 3. In the second column list everything you want to know about the topic.
- 4. After you finish reading or studying the topic list what you have learned about the topic in the third column.
- 5. Now check the W column and see which questions were answered and which were left unanswered.
- 6. Revisit the K column to see if you had any misconceptions about the topic.

Activity

Now that you have learned the KWL strategy, select one topic in your course for which you will use this strategy.

- 1. What is the title of the chapter?
- 2. Draw a KWL chart as shown below.

K What I Know	W What I want to know	L What I Learned

3. Before starting to read, write the things you already know about the topic in the K column.
4. Now, write the things you wish to know about the topic after reading the chapter in the W column. Raise questions that you would like answered as you learn about the topic.
5. Read the chapter and take notes of things you learn in the L column.
6. Are there any questions in the W column which were left unanswered? (Yes/No).
7. If yes, which were the questions left unanswered?
 Q.1 -----
 Q.2 -----
 Q.3 -----
8. Re-read the text and find answers to the above questions?
9. Were there any misconceptions about the topic? (Yes/No)
10. If so, describe in one or two sentences the misconceptions you had about the topic.

(3-7) TEST YOURSELF

- Q.1. What does the acronym KWL stand for?
- Q.2. Before starting to read, write the things you already know about the topic in the _____ column.
- Q.3. Read the chapter and take notes of things you learn in the _____ column.

3.8 SQ3R STRATEGY

The acronym SQ3R stands for five sequential techniques you may use while reading a text or a book.

S ----- Survey, Q ----- Question, R1 ----- Read, R2 ----- Recall, R3 ----- Review

SQ3R is a useful technique for fully absorbing written or printed information. By using SQ3R method actively you can read a text and get the maximum benefit from your reading time.

How to use the tool?

1. **Survey** : This step helps you gather the information necessary to focus on the chapter and formulate questions for yourself as you read the chapter. Scan the contents, introduction, chapter introductions and chapter summaries to pick up a shallow overview of the text. Read each boldface heading and subheading. This helps you create a framework for the chapter in your mind before you begin to read. This provides a structure for the thoughts and details to come. Review any graphics. (charts, maps, diagrams, pictures, and other visual aids.) Review any reading aids in the chapter. This includes italics, chapter objectives, definitions and study questions at the end of the chapter.
2. **Question** : Turn boldface headings into one or more questions and write down your question on the left third of a piece of paper. Make a note of any questions on the subject that come to mind, or particularly interest you following your survey. Perhaps scan the documents again to see if any stand out. These questions can be considered almost as study goals- understanding the answers can help you to structure the information in your mind.
3. **Read** : Now read the document. Reading the section fills in the information around the mental structures you have been building by surveying the chapter and developing questions about the section. Read through useful sections and detail, taking care to understand all the points that are relevant. As you read the section, look for the answers to your questions and jot them down, in your own words, on the right two-thirds of your piece of paper. It can also help to take notes in **mind map** format which has been explained in detail in module 4.
4. **Recall** : At the end of each section of the chapter recall what you have read. Look at the question(s) you wrote down before you read the section. Cover your answers with a piece of paper and see if you can answer the questions from memory. When you can answer your question(s) about this section, go back to step two, "question." Develop and write down your question(s) for this section, read the section and then recite again. Proceed through the chapter repeating these three steps.

5. **Review** : Once you have run through the exercise of recalling the information, you can move on to the stage of reviewing it. This review can be by rereading the document, by expanding your notes, or by discussing the material with colleagues. A particularly effective method of reviewing information is to have to teach it to someone else.

Activity

Now that you've learned about SQ3R, survey, question, read, recall and review, the next step is to incorporate this into your study strategies. Select one paper for which you will use SQ3R to read every chapter.

Survey the chapter

1. What is the title of the chapter?
.....
2. Is there a chapter summary at the beginning or end of the chapter? (Yes/No)
3. On what page(s) is the summary located? _____ Read any summary information.
4. List the main subheadings in this chapter.
 - (i)
 - (ii)
 - (iii)
 - (iv)
 - (v)
 - (vi)
 - (vii)
5. Are there any graphs, charts, or pictures? (Yes/No)
6. If so, describe one or two of the following:
Graphs:-----
Charts:-----
Pictures:-----
7. Are there study questions listed at the end of the chapter? Read any study questions Listed.
8. Are there key vocabulary words listed at the end of the chapter? Read any key vocabulary words listed

9. Describe in one or two brief sentences what this chapter will be about.

Question yourself about the chapter

Turn the major subheadings that you listed above into questions. Use who, What, Where, When, Why, and How when writing your questions.

- 1. _____
- 2. _____
- 3. _____
- 4. _____
- 5. _____
- 6. _____
- 7. _____

Read each chapter subheading one at a time and then

Recite/Recall the answers to each question you asked.

Answer all questions using one or two sentences.

- 1. _____
- 2. _____
- 3. _____
- 4. _____
- 5. _____
- 6. _____
- 7. _____

Review the entire chapter by going back to your questions and answers.

Combine the information by writing the heading, questions, and answers in outline form.

(3-8) TEST YOURSELF

Q.1. What does the acronym SQ3R stand for?

Q.2. While surveying the text which points should be kept in mind?

Another important skill you need to master to improve your information processing skill is to speed read a text. In the following section we shall learn some techniques to increase your reading speed.

3.9 SPEED READING

Speed reading is a collection of reading methods which attempt to increase rates of reading without greatly reducing comprehension or retention. The reading rate of an average student is calculated to be about 230 words per minute (w.p.m). Experts say that it is physiologically possible to read about 10,000 w.p.m. However, we consider a person who reads at the rate of 600 w.p.m. an excellent reader! By increasing your reading speed you can save time and use this extra time to revise the content. Speed reading not only saves time but also improves your comprehension since reading at a high rate keeps you mentally alert.

In this section we shall learn one of the methods to increase your reading speed, but before that let us go through some tips that could greatly enhance your reading speed.

Tips for increasing your reading speed:

1. Practice

As we all know practice makes a man perfect. Similarly, one of the most obvious speed reading technique is to practice reading as much as you can.

2. Time Yourself

It is useful to know your speed at the start, so time yourself reading a favourite passage or article in a newspaper using a stopwatch. You can also find out your reading speed using various tests available on the internet. Some of the websites offering such tests are www.speedreading.com, www.readingsoft.com, <http://mindbluff.com/askread.htm#7>. You may also find your reading speed using the method mention in the next section of this module.

3. Avoid distractions

Get rid of all kinds of distraction while you practice speed reading. Try to focus on what you read without any interruptions.

4. Make it a habit NOT to re-read

One of the best speed reading tips is to train yourself not to re-read the same material. Many people read and re-read the same words over and over again to make sure that they understand the real meaning. This is a real waste of time. To stop this habit you can use a piece of plain paper or card to cover the lines you have read. You may also run a pointer along the line as you read. This could be a finger, or a pen or pencil.

5. Eliminate sub-vocalization

While reading many people sub vocalize or silently pronounce the words. Whether you actually move your lips or say the words in your head its important to stop as it slows you down.

How do you rate your reading speed?

The average reading speed is around 230 words per minute (wpm). If your reading speed is between

- 0 – 150 wpm you are a slow reader.
- 150 – 230 wpm you are a below average reader.
- 230 – 350 wpm you are an average reader.
- 350 – 500 wpm you are a fast reader
- 500 – 800 wpm you are an excellent reader.
- > 800 wpm you are a skim reader since studies show that comprehension drops off sharply at speeds greater than 800 wpm for almost all readers.

Finding out your reading speed

To find out your present reading rate follow the following steps:

1. Select a book you would normally read provided it has no dialogue in it. Count the number of words each page contains, approximately. You need not count each word on every line, but select a few 'representative' lines and take the average number of words each contains. Then count the number of lines each page contains; multiply this total number with the number of words per line, to obtain the approximate number of words per page.
2. Keep a stop watch at hand. Place a marker against the line you start from, and another on line that totals 500 words.
3. Set the watch and start reading at your normal rate. When you reach the second marker, stop the watch. Then calculate your speed:

$$500 / \text{no. of minutes} = \text{speed in words per minute}$$

Activity

Find out your reading speed by using the above method or online by using the online tests.

What is your current reading speed?

3.10 The finger technique – to improve your reading speed

Now we shall learn the finger technique to improve reading speed. Use this technique for all your reading during the training period. The goal of this technique is to train your mind and eyes to read faster and faster, so do not try to understand everything that you read. It is enough to understand 70% or 80% only. What is important is to move your finger fast and see or read the words as your finger moves under a line.

How to use the technique?

1. Open any chapter in a textbook.
2. Keep the book upside down to make sure your mind does not try to understand anything that is written.
3. Now move your finger under the lines of print and try to see words just above your finger as the finger moves.
4. Move your finger as fast as you can from left to right under each line of print.
5. Use this technique for 5 minutes while moving your finger smoothly and rapidly with a sense of urgency and seeing the words above the finger.
6. After 5 minutes cover your eyes with your palms so that you relax your eyes and give them some rest. Do this for 2 minutes.
7. Now, keep the book upright so that as you can move your finger you can see the words, read, and understand them.
8. Take care not to move your lips or speak aloud as you read.
9. use this technique and read for 5 minutes.
10. Again take a 2 minute break to give rest to your eyes.
11. Repeat steps 2-6.
12. Repeat steps 7-10.
13. Now test your reading speed again.

Activity

Use the above technique and find out your new reading speed?

What was your old reading speed?

Everyone almost doubles their reading speed after using the finger technique.

Use the above technique for at least three weeks before you really start to become a speed reader for life.

Adapted from: Bapna, R. *Mind Power Study technique*. Mind power research institute, India.

In the next section of the module we shall try to understand the different learning styles and find out your learning style.

(3-10) TEST YOURSELF

Q.1. The reading rate of an average student is _____ (w.p.m) while that of an excellent reader is _____ (w.p.m).

Q.2. Which are the two habits that slows down your reading speed?

Q.3. What is the goal of the finger technique?

3.11 LEARNING STYLES

A learning style is a person's "characteristic strengths and preferences in the ways they take in and process information." In simple words, learning styles are different ways of learning. Your preferred styles guide the way you learn. They also change the way you internally represent experiences, the way you recall information and even the words you choose. We explore more of these features in the following sections:

Once you know your own natural learning preference, you can work on expanding the way you learn, so that you can learn in other ways, not just in your preferred style. And by understanding learning styles, you can learn to create an environment in which everyone can learn from you, not just those who use preferred style.

Felder and Silverman's Index of Learning Styles

One of the most widely used models of learning styles is the Index of Learning Styles developed by Richard Felder and Linda Silverman in the late 1980s. According to this model (which Felder revised in 2002) there are four dimensions of

learning styles. Think of these dimensions as a continuum with one learning preference on the far left and the other on the far right.

Sensory	_____	Intuitive
Visual	_____	Verbal
Active	_____	Reflective
Sequential	_____	Global

Sensory learners prefer concrete, practical, and procedural information. They look for the facts.

Intuitive learners prefer conceptual, innovative and theoretical information. They look for the meaning.

Visual learners prefer graphs, pictures, and diagrams. They look for visual representations of information.

Verbal learners prefer to hear or read information. They look for explanation with words.

Active learners prefer to manipulate objects, do physical experiments and learn by trying. They enjoy working in groups to figure out problems.

Reflective learners prefer to think things through, to evaluate options, and learn by analysis. They enjoy figuring out a problem on their own.

Sequential learners prefer to have information presented linearly and in an orderly manner. They put together the details in order to understand the big picture emerges.

Global learners prefer a holistic and systematic approach. They see the big picture first and then fill in the details.

Once you know where your preferences lie on each of these dimensions, you can begin to stretch beyond those preferences and develop a more balanced approach to learning. Not only will you improve your learning effectiveness, you will open yourself up to many different ways of perceiving the world.

Balance is the key. You don't want to get too far on any one side of the learning dimensions. When you do that you limit your ability to take in new information and make sense of it quickly, accurately and effectively.

(3-11) TEST YOURSELF

- Q.1. _____ prefer to manipulate objects, do physical experiments and learn by trying.
- Q.2. _____ prefer to think things through, to evaluate options, and learn by analysis.
- Q.3. _____ prefer concrete, practical, and procedural information for learning.

3.12 SUMMING UP:

According to the information processing model there are mainly three types of memory which are as follows:

- **Sensory Memory**

Whatever we see, hear, smell, feel or taste gets filtered through our sensory memory which in just milliseconds uses our past experience and determines the data's degree of importance.

- **Short Term Memory**

Short Term Memory is a place where conscious processing of information takes place. The information processing model represents it as a place of limited capacity where we can build, take apart, or rework ideas for eventual storage somewhere else.

- **Long Term Memory**

Long term memory contains tremendous amount of information that was acquired through years and years of formal or informal education. Information having strong emotional impact and information that we want to remember are usually transferred from our short term memory to our Long term memory.

Most of the information processing while learning is done through reading which is a very complex activity. Two strategies that are important for improving your reading comprehension include the KWL strategy and the SQ3R strategy. The KWL technique ties together your prior knowledge, your desire to learn more, and the conclusions of your learning, while by using the SQ3R method actively you can read a text and get the maximum benefit from your reading time. Speed reading is a collection of reading methods which attempt to increase rates of reading without greatly reducing comprehension or retention. The reading rate of an average student is calculated to be about 230 words per minute (w.p.m). By using the finger technique you can increase your reading speed.

A learning style is a person's "characteristic strengths and preferences in the ways they take in and process information." According to *Felder and Silverman's Index of Learning Style*, there are four dimensions of learning styles. Think of these dimensions as a continuum with one learning preference on the far left and the other on the far right.

Sensory	_____	Intuitive
Visual	_____	Verbal

Active	_____	Reflective
Sequential	_____	Global

3.13 REFLECTIONS

1. Think about what you have learned in this unit. Write about it here.

.....

.....

.....

.....

.....

2. How will this make you a better student?

[illegible]

3. How will this make you a better teacher?

[illegible]

ANSWER KEY

3-3.

Ans.1. Sensory Memory, Short Term Memory, Long Term Memory

Ans.2. sensory memory, long term memory

Ans.3. Information which has a strong emotional association or is strange or unique, or is associated with some of our critical needs or is repeated several times are transferred easily to long term memory.

3-6.

Ans.1. knowing what you want to know, knowing how deeply to study the material, active reading

Ans.2. skim

Ans.3. Scanning implies reading the chapter introductions and summaries in detail, and then speed reading the contents of the chapters. At this level of looking at the document it is worth paying attention to diagrams and graphs.

Ans.4. forefinger, pen/pencil

3-7.

Ans.1. K---Know, W---Want to know, L---Learned

Ans.2 K

Ans.3. L

3-8.

Ans.1. S---survey, Q---Question, R---read, R---recall, R---review.

Ans.2. While surveying the text one should scan the contents, introduction, chapter introductions and chapter summaries to pick up a shallow overview of the text. Read each boldface heading and subheading. Review any graphics. (charts, maps, diagrams, pictures, and other visual aids.) Review any reading aids in the chapter. This includes italics, chapter objectives, definitions and study questions at the end of the chapter.

3-9.

Ans.1. 230, 600

Ans.2. Re-reading a text or sub-vocalisation reduces reading speed.

Ans.3. The goal of the finger technique is to increase your reading speed.

3-11.

Ans.1. Active learners

Ans.2. Reflective learners

Ans.3. Sensory learners

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