CHAPTER – II

READING COMPREHENSION AND MULTIMEDIA
CHAPTER-II

Reading Comprehension and Multimedia

2.0. Introduction

Reading is a complex skill which involves more than the ability to recognize, and derive the meaning of individual words, sentences, and larger linguistic units such as phrases and clauses. It starts with decoding a linguistic surface representation encoded by the writer, and ends with a meaning which the reader constructs mentally. Thus reading can be viewed as an active decoding process of “building up a meaning from a text, from the smallest textual units at the ‘bottom’ (letters and words) to large units at the top” (Carrell et al., 1988). With this explanation it is apt to discuss the various views and theories regarding reading.

However, for Walpole (1998) the text and the context together produce meaning. It emphasizes the importance of contextual features in comprehending a text. The scholar says that comprehension is “building understanding both of a particular text and of the more global concepts around which it is built”. Pertaining to this view, the researcher is interested to know how the reader can bring meaning to the text, and at this stage a glance at the views and theories of reading, draws one’s attention on the importance of background knowledge, and concludes the chapter with an account on the use of multimedia which provides the contextual features to arrive at the meaning, and thereby direct the reader in one’s reading comprehension.
2.1. Views on the Theories of Reading

A brief research in reading brings to light that reading theories have had their shifts and transitions. The traditional view focuses on the printed form of a text, and moves to the cognitive view that enhances the role of background knowledge in addition to what appears on the printed page. Ultimately, it culminates in the metacognitive view, which defines the control readers executing their ability to understand a text.

2.1.1. The Traditional View

In the traditional view of reading, Dole et al., (1991) presents that beginners in reading acquire a set of hierarchically ordered sub-skills that sequentially build towards comprehension ability. Having mastered these skills, readers are viewed as experts who can comprehend what they read. In this view, the reading process is conceptualized as learning words, one at a time, and memorizing the meanings would lead to successful comprehension of the sentences. Therefore, reading came to be explained as a linear process, where the reader first accesses the words, and by gaining word meanings, constructs the meaning of the text. Here, meaning is seen as residing entirely in the text, and the reader has to reproduce the meaning.

Complementing this view, Nunan (1991) informs that reading is basically a matter of decoding a series of written symbols into their aural equivalents in the search for arriving at a meaning in the text. Linguists refer to this process as the ‘bottom-up’ view of reading. The view that reading involves associating written words with their speech equivalents, which in turn is linked with meaning, is also believed in the Behaviourist psychology.
Hence, this view of reading relies more on the formal features of the language, mainly words and structures, and ignores the fact that besides the knowledge of linguistic features, background knowledge is also necessary for comprehension to take place. To counteract this over-reliance on form in the traditional view of reading, the cognitive view was introduced.

2.1.2. The Cognitive View

In reaction to the traditional view the cognitivists uphold the idea that readers are active and constructive, and not passive in their interaction with the text. To confirm this, the cognitivist explains the interplay of schema relevant to grasp the information in the text, and has mentioned that the schema theory of reading fits within the cognitively based view of reading. Rumelhart (1977) has described schemata as ‘building blocks of cognition’ which are used, in the process of interpreting sensory data, in retrieving information from memory, in organising goals and subgoals, in allocating resources, and in guiding the flow of the processing system. Rumelhart has also stated that if the learner’s schemata are incomplete, and do not provide an understanding of the incoming data from the text, one will have problems in processing and understanding the text. Hence, for successful comprehension to occur, the reader must be familiar with the text type and its contents, and should be capable of activating the relevant mental structures to comprehend the message.

Cognitively based views of reading comprehension emphasize the interactive nature of reading, and the constructive nature of comprehension. Dole et al., (1991) have stated that, besides knowledge brought to bear on the reading process, a set of flexible, adaptable strategies are used to make sense of a text, and to monitor ongoing
understanding. The strategies needed to read literally or comprehend the message conveyed are discussed later in this chapter.

2.1.3. The Metacognitive View

Having seen the importance of schema in the process of reading comprehension, researchers agree that mental processes do vary from one individual to another, and that these processes are influenced by a number of factors internal and external to the individual. According to them, the reason why the reading process breaks down for some readers is that they think they understand a passage but at the same time they are aware that some understanding is missing in certain parts. In contemporary terms, during such reading process, the readers are not activating their metacognition. Metacognition is the process of “thinking about or knowledge about the learning process.” (O'Malley and Chamot, 1990). For example, good readers use metacognition i.e. engage themselves in planful thinking, flexible strategies and the process of self monitoring. They think about the topic, and are always conscious about their own understanding as they go on reading.

Sara Cotterwall (1991) highlights the definition of metacognition by Brown, Armbruster and Baker (1986) “metacognition as one’s understanding of any cognitive process. In the context of reading it refers first to the knowledge of strategies for understanding written texts and secondly control of these strategies”. In this context, Block (1992) has gone even further to define the control readers executing their ability to understand a text. Block refers to this control as metacognition. Hence, metacognition involves thinking about what one is doing while reading.

Klein et al., (1991), a metacognitivist, has stated that strategic readers attempt the following while reading to regulate and modify a particular cognitive activity. These
strategies consist of: identifying the purpose of reading before reading, identifying the form or type of the text before reading, thinking about the general character, and features of the form or type of the text, projecting the author’s purpose for writing the text (while reading it), choosing, scanning, or reading in detail, making continuous predictions about what will occur next based on information obtained earlier, and conclusions obtained within the previous stages. These interactive variables operate simultaneously, and enable the reader to reconstruct the textual meaning in his own words by paying attention to the subsystems of the text. Thus reading in this view is essentially an encoding and decoding process. The writer encodes the thoughts as language is, and transforms the thoughts into linguistic representation which when received by the reader are decoded into thoughts.

Having observed the various views on the process of reading, the theories related to reading comprehension are discussed subsequently.

2.2. Theories of Reading Comprehension

Reading is a process in which the reader uses information to decide among alternatives, whereas comprehension is thought to be a process of reduction of uncertainty. The process of comprehension occurs only when the reader is able to eliminate some or all of the alternative meanings conveyed by the visual information. Hence, “reading comprehension includes the correct association of meanings with word symbols, the evaluation of meanings which are suggested in context, the selection of the correct meaning, the organization of ideas as they are read, the retention of these ideas, and their use in some present or future activity” (Yoakam, 1951). Reading is seen as an
active process, and is similar to the acquisition of a skill. In the process of acquisition of any skill, a learner begins at the cognitive phase, and as his skill increases the learner moves on to the associative phase, and finally reaches the autonomous phase. As the researcher's concern is with the skill of reading comprehension, a discussion follows on how information is processed through reading in the cognitive paradigm.

Gunning (1996) outlines three main theories of reading comprehension. These theories are Schema Theory, Mental Models, and Proposition Theory. The Schema Theory expresses in plain words that all meaningful knowledge acquired through life long experience is stored in the memory of a learner's previous or background knowledge in the form of units called schemata. The Mental Model brings forth a mental image of the message while reading, and helps learners to reconstruct a more accurate picture, while the Proposition Theory describes the complete reading process, from recognizing words until constructing a representation of the meaning of the text.

2.2.1. Schema Theory

Gunning (1996) defines a schema as the organized knowledge that one already has about people, places, things, and events. According to the Schema Theory, there is an interaction between the reader's own knowledge and the text, which results in comprehension. Knowledge already gained through prior experience is stored as knowledge structures called schemata. Each knowledge structure exists as an object, idea or event as well as a set of attributes, which links it to other knowledge structures. Further each schema is "filed" and stored in an individual compartment. While attempting to comprehend reading material, readers relate this new information to the existing information they have compartmentalized in their minds, as 'files' for future
use. Schema Theory informs, one’s reading comprehension may vary depending on how extensive their ‘files’ are created in the mind.

The Schema Theory, at present is one of the dominant theories of text comprehension. Because of the breadth of knowledge encapsulated in a schema, it is an ideal instrument to use in understanding a text. In order to comprehend what one has read, the learner has to relate the information in the text to the knowledge stored in the schemata of the learner’s mind. In Figure 2.1 the process of reading and comprehension is conceptualized as being executed by a series of stages that include extracting physical features of letters, encoding words, and accessing the lexicon, assigning roles and so on. In this diagram, the major stages of reading are shown in the left column, while the more permanent cognitive structures, and processes are shown in the boxes in the middle and right side of the diagram.
Fig 2.1 A Schematic Diagram of the Major Processes and Structures in Reading Comprehension by Solso (2005)
2.2.2. Mental Model Theory

Another major theory about reading comprehension is the Mental Model. This model can be thought of as a movie created in one’s mind, based on the reading content. Gunning (1996), gives a detailed description of this process, stating that a Mental Model is constructed most often when a learner reads fiction. The reader focuses on the main character, and creates a mental model of the circumstances in which the character finds oneself. Thus a visual representation is obtained, and this enables the mental model to reconstruct or update the new circumstances as the situation changes, but the items important to the main character are kept in the foreground. This model helps the learners to reconstruct a more accurate picture.

This theory can be seen as similar to the cognitive approach which views learning a language as an individual psycholinguistic act. From this perspective, language learners construct a mental model of a language system, based not on habit formation but rather on innate cognitive knowledge through interaction with comprehensible, meaningful language.

2.2.3. Proposition Theory

According to this theory, the reader while reading, constructs a main idea or macrostructure as one processes the text. These main ideas are then organized in a hierarchical manner to form a network or list of propositions, thus forming a propositional representation of the text, and provide the meaning of any word (Gunning, 1996). If the text is coherent, all nodes of the network are connected to each other leading to a situational representation, which describes the complete reading process, from recognizing words until constructing a representation of the meaning in the text.
This theory suggests that semantic memory consists of a vast network of concepts which are composed of units and properties, and are linked by a series of associated bonds and related concepts.

Figure 2.2 shows a model of semantic processing. The ellipses stand for concepts and the lines are associations. The strength of an association between concepts is indicated by the length of the connecting lines. In order to recall the concept red, the mind has to consider these various concepts, and associate it with the relevant matter to arrive at an understanding.
Fig 2.2 A Model of Semantic Processing by Collins and Loftus (1975)
It is interesting to note that the three theories are intertwined. Each one supports the other. In order to form a mental model in one's mind, one must have a schema of that topic already stored and according to the Proposition Theory, the learners form a mental model in their mind while forming the macrostructure or the main idea.

Schemata, therefore, can be considered as the key units of the comprehension process. Most of the mental processing is involved in finding the right schema that account for the incoming information. Hence a schema not only accounts for what is directly perceived but also of unseen features, and helps the learner to arrive at the comprehension process through inference as well.

Forming a schema is the most basic comprehension tool used by learners. As they become more advanced, they can build on their base of schemas, and create mental models throughout their reading by making use of the knowledge structures present in the mind.

Complementing the theories of reading comprehension, models of reading explain the manner as to how the text is processed at the linguistic, and conceptual level by the reader to attain complete comprehension. Given below are the models of reading.

2.3. Models of Reading

Another major approach to understanding the reading process is to describe it using metaphors. The most common metaphors for describing the reading process, which starts from the recognition of letters and then words, phrases, sentences and units are
Bottom-up processing, Top-down processing, Interactive processing, Interactive compensatory processing model and Compensatory - encoding process model.

2.3.1. Bottom up Processing Model

This model views reading as a 'linear processing'. Readers engage in a decoding process in order to reconstruct the writer's intended meaning by recognizing the printed letters and words, and building up meaning from the smallest unit at the 'bottom' (letters and words) to larger units at the 'top' (phrases, clauses, sentences etc.) (Carrell et al., 1988). The reader remains a passive recipient of information, and conforms to the writer's norms. Only one meaning is elicited by the reader from the text-the writer's intended meaning.

According to this model, information processing occurs in a series of discrete stages where each stage transforms the input into the next by adding information. While the writer encodes, the reader decodes in order to extract the ideal meaning from the text. This model places primary emphasis on textual decoding.

2.3.2. Top-down Processing Model

Goodman (1967) implies that this processing model, considers the reader to be an expert in sampling 'strategies' and skilled at 'hypothesis testing' and as one, who is able to combine meaning, and reduce the difficulties in the text. In this model importance is given to the meaning of the text. Meaning is arrived by predicting, and inferring the underlying meanings of words and sentences. According to this model meaning is accessed by activating prior semantic, syntactic and discourse knowledge. The clauses and sentences generate an idea in the reader's mind. These ideas in turn give rise to a prediction about what follows. The more the reader is able to guess the meaning of the
text, the better will be the comprehension. The discourse features help the reader create a mental picture of the structure of the text. The predictions are made by the background knowledge or schema of the reader. Thus, the construction of meaning is partly based on the text, and partly based on the prior knowledge of the content of the text.

2.3.3. Interactive Processing Model

Widdowson (1979) defines it as “an interaction between the writer and the reader, mediated through the text”. Alderson and Urquhart (1984) inform that reading involves two necessary elements: a reader and a text besides a third element: the writer. The text is processed by the reader through interaction and hence, reading is interactive. This interaction depends on how much knowledge the reader brings to the text, and how much one wishes to extract from it. For this interaction to be successful the reader and the writer must share the same code, and have shared assumptions about the world-knowledge, attitudes, values and beliefs. This model combines the ‘top-down’ and ‘bottom-up’ strategies for getting the meaning from the text by drawing upon one’s knowledge of the world, and infers meaning of the unknown word or phrase. It also explains the reading process as continuous, and simultaneous interaction between the text at the lexical, syntactic and semantic levels, and the reader with the background knowledge and purpose of reading. Hence the reader and the text contribute equally towards comprehension in this model. This model is viewed as a more acceptable approach of the way one accesses the meaning of a written text. It is when the reader is able to interpret the meaning of a text that the reader has achieved the reading efficiency. Figure 2.3 shows how meaning is constructed through interaction between the text, the reader and the context.
2.3.4. Interactive Compensatory Processing Model

Stanovich (1980) developed the interactive compensatory processing model to explain the contribution of the text and the readers. If the content of the text is unfamiliar, then the reader becomes text dependant, and if the reader is unfamiliar with the content (bottom up process) then also, the reader becomes text dependant. But, if the reader is familiar with the content, then the reader contributes more (top down process) towards the comprehension of the text. This model assumes that "a deficit in any knowledge source results in heavier reliance on the other knowledge source regardless of their level in processing hierarchy" (Stanovich, 1980). This model also states that the reader and the text should contribute for effective comprehension. As reading is not a linear process, both the text and the reader contribute towards meaning construction.
2.3.5. Compensatory – encoding Process Model

Walczyk (2000) has proposed the compensatory encoding process model giving insight on how, when and why automatic and control process interact under different task conditions. While Stanovich’s interactive compensatory processing model describes the reading process at the beginner’s level, Walczyk’s model is applicable to advanced level readers. The model explains the process of reading related to advanced readers who are aware of the strategies to overcome the problems while reading. The reader uses either or both controlled (slow attention demanding activities) or automatic (quick effortless minimal attention drawing activities) processes to overcome the problems while reading. As mentioned earlier, the readers are always conscious about their own understanding as they go on reading, and make use of their metacognitive skills.

Summing up these models, one could realize that in Bottom up processing, the reader is able to decode the text alone, whereas in Top-down processing the reader uses the background knowledge to understand the message decoded from the text. In Interactive processing, the readers use both the processes to comprehend the implicit as well as the explicit message encoded in the text. When the reader finds difficulty in comprehending the message, it leads to a dependence on the text. Therefore, the reader uses the Compensatory processing in the beginning, and then utilizes the various metacognitive strategies to overcome the comprehension process through the Compensatory-encoding process.

From the above discussion, it could be stated that the reading processing models are based on experiments in which variables vary from group to group, different ages and skills, and also on different dimensions of the text. In this sense every model has its own
limitations in terms of scope and focus. A number of theories about reading exist in which different parts of the reading process are described: recognizing letters and words, syntactic parsing of sentences, understanding the meaning of words and sentences, and incorporating the meaning of the text in the presence of other current knowledge about the same topic.

With a view of the various theories of reading and comprehension, the tools or strategies necessary to help the learners process the act of reading are discussed in the following section.

2.4. Reading Comprehension Strategies

Strategies are functions employed by the learner to help in the acquisition, storage, retrieval and use of information. These are specific actions taken by the learner to make learning easier, faster and more self directed to new situations. Increasing learners’ reading comprehension strategies is an important aspect of any teaching programme, as they are tools that learners can use to help determine the meaning of what they read. Teaching comprehension as a strategic process enables readers to make connections and move beyond literal recall. Towards this concept, Colley (1987) describes three possible outcomes from comprehension process:

- First, the reader’s comprehension of the text will correspond exactly to the author’s intended meaning.
- Secondly, the reader may construct a satisfactory personal meaning. A psychological or phenomenological interpretation of the text that differs from the authorial intention.
- And finally, the reader may totally fail to comprehend the text and construct the interpretation of it.

For any reading programme, an important tool is the reading strategy. These strategies enable the reader to access the input, make it comprehensible, and use it later when required. Hence reading strategies are of significance for any teacher as they reveal the different ways by which individual readers comprehend the text.

2.4.1. Strategies to Improve Reading Comprehension

According to Gunning (1996) a strategy is an individual’s approach to a task. There are four main types of comprehension strategies, which include Preparational, Organisational, Elaboration and Monitoring. These strategies could be used by the learners to improve the text or reading comprehension.

2.4.1.1. Preparational

Preparational strategies are those that activate prior knowledge about a particular topic. This method is used to get learners thinking about the topic they are about to work on. It is much easier to retain knowledge about a subject when the learner is familiar with the content. Gunning identifies predicting as a type of Preparational strategy to preview the parts of the text to be read. The portions of text, which are helpful in previewing, can either be pictures, titles, or the cover of the book. Using the prior knowledge of the subject the learners can think or guess the events to be followed.

2.4.1.2. Organisational

Organisational strategies are those that help in selecting important details, and building relationships from them. These strategies include: identifying the main idea and topic sentences, classifying information, deciding which information is relevant,
sequencing and summarizing. Each of these strategies is complex, and methods for improving them need to be taught starting from the basic ideas, and gradually getting on to more difficult ones. Summarizing, in particular, has been identified as a difficult skill to develop.

2.4.1.3. Elaboration

Elaboration is an additional processing of the text, used by the reader to increase one's comprehension. It involves forming connections between the text and the reader's background knowledge of the subject. Making inferences, picturing images, and asking questions are a few examples of elaboration strategies.

Huffman (1998) identifies 'K-W-L' as an elaboration strategy, which connects background knowledge of the topic to be addressed. 'K-W-L' is an acronym for the three steps of the procedure: describing what one Knows, what one Wants to know, and what one Learned. The reader uses the first two steps before reading the text, to assess background information, and the third step is used later to make the connections.

2.4.1.4. Monitoring

Monitoring enables the reader to be aware of one's own mental process while reading. It is an advanced technique that involves a great deal of independent thinking. It occurs when a reader is aware of the inability to understand what was just read. Hence, the act of monitoring allows the reader to go back, and find a way to gain understanding of the topic. Monitoring is also an awareness to use the three other types of reading comprehension strategies.

The four types of strategies discussed so far can be seen as rather independent of each other. Readers will be able to apply the most complex strategy only when they have
knowledge of the comparatively simple strategies. While viewing the different strategies, Preparational strategies occur before the actual reading takes place, and are incorporated in the Schema Theory, whereas the Organisational strategies take place during and after the text is read. In fact these strategies are based on both the Mental Model Theory and the Proposition Theory. As for the Elaboration strategies, it can take place before, during and after reading, and therefore, are dependent on all three major comprehension theories. Finally, Monitoring strategies are the most complex, where all nodes of the network have to be connected to each other leading to a situational representation. These strategies take place as the reading is in process.

2.4.2. Strategies to Read for Meaning

Effective reading implies an understanding and an interpretation of the language patterns. The meaning of a sentence depends on the manner, in which the reader is able to master the skills of relating to the various words that form a logical sequence in a sentence.

Teacher's comprehension corner offers six strategies that learners could use to 'Read for Meaning' such as: making connections, questioning, visualising, inferring, determining importance and synthesizing.

Strategy -1: Making Connections

In this strategy, the learners connect their background knowledge to the text they are reading. Readers comprehend better when they actively think about, and apply their knowledge of the book's topic, their own experiences, and the world around them. Stephanie and Anne (2000) in their book 'Strategies that Work' state that "When
children understand how to connect the text they read to their lives, they begin to make connections between what they read and the larger world. This nudges them into thinking about bigger, more expansive issues beyond their universe of home, school and neighbourhood.”

**Strategy -2: Questioning**

Through the use of questioning, learners understand the text on a deeper level because questions clarify confusion, and stimulate further interest in a topic. “Through questioning, learners are able to create a mental image about content and concepts before, during and after reading by: constructing meaning, enhancing meaning, finding answers, solving problems, finding specific information, acquiring a body of information, discovering new information, propelling research efforts and clarifying confusion” Stephanie and Anne (2000).

**Strategy -3: Visualising**

With this strategy, learners create mind pictures and visualizations when they read. Readers use the text material and their own prior knowledge to create one’s own mental pictures of what is happening in the text. “Visualising personalizes reading, keeps us engaged and often prevents us from abandoning a book.” Stephanie and Anne (2000).

**Strategy -4: Inferring**

Learners use this strategy to make inferences about the text they are reading in order to interpret meaning and develop deeper understanding. Readers comprehend better when they make connections, and construct their own knowledge (using prior experiences, visualising, predicting and synthesizing) to interpret the ‘big idea.’ It is like a mental dialogue between the author and the learner.
Strategy -5: Determining Importance

When learners read nonfiction they have to decide and remember important incidents from the material they read. The purpose of this strategy is to teach learners to discriminate the ‘must know’ information from the less important details in a text. “When learners read and understand nonfiction, they build a background for the topic and acquire new knowledge. The ability to identify essential ideas, and salient information is a prerequisite to developing insight.” Stephanie and Anne (2000).

Strategy -6: Synthesizing

Using this strategy learners weave together the information they have read, and their own ideas into new complete thoughts. Readers comprehend better when they sift through information to make sense of it and to act upon it - such as judging or evaluating the author’s purpose to form a new idea, opinion, or perspective. This is the highest and most complex form of comprehension. Figure 2.4 shows the manner, in which the sub strategies interact with the concept to arrive at the process of comprehension.
2.4.3. Strategies to Find Main Ideas

The ability to identify the main idea is necessary for interpretation, and understanding of what is written. It is based on an accurate comprehension of the word, the phrase and the sentence. 'REDW' is a good strategy used to find the main idea in each paragraph, and to comprehend the information contained in a reading assignment. Each of the letters in 'REDW' stands for a step in the strategy.

Read

In this strategy the learners read the entire paragraph to get an idea of what the paragraph is about. It helps to whisper the words as one reads or to form a picture in
one’s mind of what one is reading. Once a general idea of the paragraph is formed, it leads to the next step.

Examine

The learners examine each sentence in the paragraph to identify the important words that breathe meaning into the sentence. It helps them to ignore the words that are not needed, and enables them to write on a sheet of paper only those words that lend meaning to the sentence.

Decide

The learners then reread the related words or phrases written for each sentence in the paragraph. These words form the main idea of the paragraph. They then choose the sentence which contains the words that best describe the main idea of the paragraph, and write it down as the topic sentence. The other words written relate to the supporting details for the main idea.

Write

Finally they write the main idea for each paragraph in the notebook. This will provide a written record of the most important ideas, and enable them to comprehend the passage.

The learners can identify the main idea of a sentence by first underlining the key words, then identify the key sentence in a paragraph, and finally make an inference from a series of sentences as to what the basic idea is.

In the above mentioned strategies, prior knowledge is viewed as an advantage to the reading comprehension process. It is important to note that the prior knowledge of the reader is already in an organized form (schemas). It is only up to the reader to recall,
and organize the new text information and integrate it with the prior knowledge. When learners activate their prior or background knowledge in comprehending the texts, they not only find the texts easier to understand but also remember them better. Thus “comprehension process is one in which a reader makes sense in the light of his background knowledge” (Alderson and Urquart, 1984).

2.5. The Role of Prior or Background Knowledge in Reading

The current view of reading comprehension strategies has shifted the focus from the simple process of lifting the message from a text to that of an active complex process. Consequently the reader draws information from several sources concurrently to construct a representation of the message in the text.

Researchers like Hornsby, Sukarna and Parry (1986) and Maria (1990) show that prior knowledge plays an important role in reading comprehension. They have indicated that comprehension is a process and product, which involves reader’s prior knowledge, and experience in understanding the text. As mentioned earlier the actual comprehension occurs during the process of reading a text. Hence, successful reading comprehension is viewed as the process whereby the readers actively interact with the cues provided by the author, and one’s prior knowledge to infer the author’s intended meaning. With this explanation, the next issue is to ascertain how prior or background knowledge helps to form the schema necessary to comprehend the text. Figure 2.5 shows the manner in which information is processed in the mind with the help of background knowledge.
The boxes in the model refer to short term (or working) and long term memory stores. The arrows refer to processes, including selecting information to pay attention to (i.e. arrow from input to short term memory) organising incoming information in short term memory (i.e. arrow from short term to short term memory) and integrating prior knowledge from long term memory with incoming information (i.e. arrow from long term memory to short term memory).
2.5.1. Prior or Background Knowledge in the Form of Schema

It is to be noted that this prior knowledge or knowledge of the world which the reader brings to the topic of the text does not exist exclusively in a factual form but as 'interpretations', which come from various sources like the family, the community, the school and the cultural milieu. This combination of hard facts and interpretations is what the cognitive psychologist call as 'schema'. These “schemata are mental representations used during perception, and comprehension that evolves as a result of this schemata process combine to form a whole which is greater than the sum of the parts” Flynn(2002). Therefore, as readers peruse, they incorporate new knowledge into the previously existing schema or create a new schema to accommodate it. This fusion of old and new data leads to comprehending the message. “By evaluating what you read and associating what you already know with information you are acquiring, you will read with more understanding and you will remember better what you read” (Parker, 1959-cited in Alderson and Urquhart, 1984).

Several studies have shown the beneficial effect of prior knowledge on reading comprehension. Jimenez, Garcia and Pearson (1996) have investigated the positive effects of prior knowledge on second language reading comprehension. Further, McBride-Byrne (2002) has also claimed “accessing prior knowledge in a most advantageous learning model can result in enhancing the learner's acquisition of literacy”. Hence, comprehension process is one in which a reader makes sense of a text in the light of his background knowledge. Not only does lack of knowledge about a topic impede comprehension, but the extent of knowledge influences the quality of understanding that a reader can construct.
2.5.2. Importance of Knowledge in Comprehension

'Knowledge means the storage, the integration and group of information in memory’ Solso (2005). The simple generalisation in this context would be, the greater the knowledge of a reader, the better the comprehension of the text. One way to account for this generalisation is that knowledge can be viewed as an organized collection of information. These pieces of information are transformed into neurological structures, and meaningful symbols labeled as internal representations of knowledge in the mind. When combined with contextual information these provide the basis for comprehension (i.e. experiences lead to information). New information gathered through reading can be assimilated more when existing cognitive structures and information already exist. Conversely, insufficient knowledge limits comprehension because the reader must develop some structure of knowledge about the material as well as encode the information being read. Hence, knowledge will enable the reader to posit a good schema which in turn will direct the reader’s comprehension of the text material. Consequently, it appears that a strong relationship exists between reading performance and prior knowledge. Figure 2.6 explains the process of comprehension- the internal representation of knowledge in the mind with the contextual information results in comprehension.
2.5.3. Cultural Knowledge as Reader's Experience

As already mentioned, comprehension is a process as well as a product, which involves reader's prior knowledge and experience in understanding the text. Second language learners may lack exposure to the cultural background of the native speakers, fail to experience the situation in the play.

In this context, Fries (1945, 1963) cited in Alderson and Urquhart (1984) was the first American linguist to incorporate cultural background knowledge into a description of meaning. In his analysis, Fries has highlighted three levels of meaning: lexical, grammatical and socio-cultural. Comprehension of the total meaning of the sentence occurs only when the linguistic meaning of the sentence is fitted into a social framework of organized information. The importance of a social cultural level in a passage can be
seen in the story of 'Rip Van Winkle'. The archaic use of the term 'Tory' after the absence of twenty years can be attributed to the fact that its cultural meaning had changed from 'good citizen' to 'enemy of the new government'. Fries argues that readers have missed the meaning of the story if they do not understand the reaction of the group to Rip's words. This type of reading will lead to interference at the denotative level, and learners must have a complete understanding of the background information if there is to be a complete comprehension of the text. Reading comprehension would seem to be easier when the cultural background is familiar, and the learners can draw on cultural information in the decoding process.

Hence, many things seem to enter into comprehension: the learner's grasp of the subject matter of the reading, their understanding of the cultural content implicitly or explicitly expressed, and their ability to cope with the grammatical structures in the passage. It appears that a strong relationship exists between reading performance and prior knowledge.

Learners who fail to construct meaning through dynamic interaction (transaction) among the reader's existing knowledge, the information suggested by the written language, and the context of the written situation need to be provided with extra comprehensible input. Rivers and Temperley (1978) cited in Alderson and Urquhart (1984), emphasise providing background information, and supporting reading selections with illustrations as ways of adding new meaning to the text. Further, the activation of prior or relevant knowledge using multimedia aids, such as visual advance organizers, is also a way of supporting the process of integrating newly acquired knowledge with an existing mental model. In the following section the manner in which the printed words
are decoded, and the visual input needed to decode the abstract printed words into concrete mental visuals for comprehension to take place are analysed.

2.6. The Role of Multimedia in Reading Comprehension

Multimedia instructional environments are widely recognized to hold great potential for improving the way that people learn (Sweller, 1999; van Merrienboer, 1997). In this environment, learners are exposed to material in verbal (such as on-screen text or narration) as well as pictorial form (including static materials such as photos or illustrations, and dynamic materials such as video or animation). Although verbal forms of presentation have long dominated education, there is encouraging evidence that the learner's understanding can be enhanced by the addition of visual forms of presentation (Sweller, 1999).

Taking a learner-centered approach, a recall of the historical perspective of multimedia, and a comprehension of how and when visual or animation affect learning and comprehension, will enhance its value.

2.6.1. Historical Perspective of Multimedia Technology and Language Learning

From a historical perspective, an understanding of the use of technology in a second or foreign language (L2) has changed considerably in the last several decades. Virtually every type of language teaching has had its own technologies to support it. Language teachers who followed the grammar-translation method (in which the teacher explained grammatical rules, and learners performed translations) relied on one of the most ubiquitous technologies - the blackboard as a perfect vehicle for the one-way transmission of information. The blackboard was later supplemented by the overhead
projector, another excellent medium for the teacher-dominated classroom, as well as by early computer software programmes which provided what were known as "drill-and-practice" in the use of grammatical exercises.

Later, the audio-tape became the perfect medium for the audiolingual method (which emphasized learning through oral repetition). By the late 1970s, the audiolingual method fell into disrepute, as the repetitive drills focused only on language form and ignored the communicative meaning.

The 1980s and 1990s saw a shift towards communicative language teaching, which emphasizes learner engagement in authentic, meaningful interaction. Within this general communicative trend, one can note two distinct perspectives, the cognitive approach and sociocognitive approach, both of which have their implications in terms of how best to integrate technology into the classroom.

Cognitive approaches to communicative language teaching are based on the view that learning a language is an individual psycholinguistic act. From this perspective, language learners construct a mental model of a language system, based not on habit formation but rather on innate cognitive knowledge in interaction with comprehensible, meaningful language. Whereas, sociocognitive approaches, in contrast to cognitive approaches, emphasize the social aspect of language acquisition; learning a language is viewed as a process of apprenticeship or socialization into particular discourse communities (Schieffelin and Ochs, 1986; Gee, 1996). From this perspective, learners need to be given maximum opportunity for authentic social interaction, not only to provide comprehensible input, but also to give learners practice in the kinds of communication they will later engage in outside the classroom. In this area, the Internet
is a powerful tool for assisting a sociocognitive approach to language teaching. The internet with the use of a computer facilitates opportunities for interaction within the classroom. This approach is called the computer assisted classroom.

The advantage of using computers with audio-visual aids in language teaching can be effectively employed in the classroom to provide comprehensible input for text comprehension. Such aids provide the learner a deeper, near life like experience of the language within a whole context. Facial expressions, gestures, postures are all sources of aids to comprehensible input. Thus, "Video in instruction is considered potentially capable of developing a wide range of linguistic and semi linguistic skills, for example highlighting language functions, pinpointing non verbal signals, showing the relationship between linguistic and paralinguistic features" (MacKnight 1983).

In this context, the immediate focus is on the potential of multimedia as an educational tool, and as comprehensible input for comprehension. The issues of interest are:

- Visuals promote learning and comprehension.
- Learners comprehend more from visuals or animation than from other modes of presentation.
- Media can provide the sufficient input to comprehend the text.
- The process of comprehension of text differs from the comprehension of pictures, and the combination of pictures and text affect comprehension.

2.6.2. Media as Comprehensible Input

As discussed briefly in the preceding section, the process of text comprehension involves first the construction of a mental representation of the text’s linguistic surface
structure, then the construction of a propositional representation of the semantics of the text, and eventually the construction of a mental model of the subject matter described in the text with the help of existing cognitive schemata (Carrell, 1984b; Schnotz and Grzondziel, 1996, Van Dijk and Kintsch, 1983). Figure 2.7 shows the various functions of multimedia which help to provide the necessary comprehensible input for text comprehension.

**Fig 2.7 Functions of Multimedia Aids for Text Comprehension by Chun and Plass (1997)**

According to Krashen’s input hypothesis, language can be acquired through understanding messages or by receiving comprehensible input. One can understand language with the help of the context, which as stated earlier includes extra linguistic information, knowledge of the world and the previous acquired language. Therefore, there is an immediate research need to answer the question of how the teacher can ensure
comprehensibility so that the learners can infer meanings for linguistic messages in the second language.

As an answer to the above asked question, the researcher uses the view of Krashen, (1989). According to this view, one of the means of providing sufficient comprehensible input for language comprehension in the classroom is the use of the image or visual element as well as other realia. To justify why visuals can be effective for learning, Schnotz, (1993) argues that the construction of a mental model of subject matter is qualitatively different in learning from text and learning from images. The linguist argues that “graphics, like mental models, possess also inherent structural properties used for their representational functions, which is not the case with text”. Consequently, while the construction of a mental model from text requires the construction of propositional representations, which then have to be integrated into the mental model, the use of images “provide the possibility of a relatively direct construction of a mental model”, since they, like mental models, employ analogies to represent the subject matter. In other words, text comprehension requires an indirect transformation between the symbolic representation of the text and the analog mental model, while the comprehension of an image requires establishing an analogy between the picture and the corresponding mental model. The pictures help in selecting the information, organizing the information into coherent mental propositions, and finally help in integrating the propositions into a mental model. At each stage the visuals function as aids to comprehend the text.

The present study which looks into the effect of multimedia environment to comprehend the plays of Shakespeare, uses the view of Plass et al., (1998) who speculate
that “learners engage in three major processes—selecting, organizing, and integrating—when they are presented with visual and verbal information such as illustrations and text...according to generative theory, meaningful learning is enhanced when a learner can construct and coordinate visual and verbal representations of the same material” Plass et al., (1998). Mayer and Sims (1994) also claim that multimedia software should help learners construct referential connections between two forms of mental representations, the verbal representational system and the visual. These referential connections are more easily built when both verbal and visual materials are presented contiguously.

2.6.3. Multimedia and Text Comprehension

Mayer (1984) names three types of aids for text comprehension: (a) aids for selecting information, (b) aids for building internal connections, and (c) aids for building external connections. Aids for selecting information serve mainly to focus the reader’s attention on certain aspects of the target information, and thus improve the chance that this information is processed. Aids for building internal representations are designed to support the reader’s building of internal connections among the units of information presented, that is, organising the presented information around coherent explanations based on cognitive schemata. The third type of aids for text comprehension, i.e. aids for building external connections, are designed to help the reader build connections between the ideas in the text, and to integrate the information with existing relevant knowledge. These aids support the construction and extension of the mental model based on the propositional representations.
Complementing the aids for text comprehension, the integration of new information into the existing mental model can be supported with a concrete advance organiser (Ausubel, 1960; Mayer, 1984). This advance organiser could be presented either as a text or as a video. Although the cognitive processes involved in comprehending the text are qualitatively different from those involved in comprehending the video, the function of the concrete advance organiser as support for the integration of information into the mental model remains unchanged, irrespective of the presentation mode. Hence, the aids for text comprehension could be presented in textual form, in visual form, in auditory form, or in any combination of these presentation modes. Visual information, on the other hand, is an analogous representation of information that can be directly mapped onto the mental model by establishing an analogy between the visual information and the corresponding mental model (Gentner, 1983; Schnotz and Grzondziel, 1996).

The model in Figure 2.8 views text comprehension as the process of transforming a symbolic representation of information into a propositional representation, and then, based on cognitive schemata, into an analog mental model thus revealing that Text comprehension can be improved by instruction in multimedia environments.
Hence, video programmes can be effective as classroom materials or tools in teaching, as they have all the elements necessary to make input comprehensible. It is for the language teacher to exploit such materials in a manner that will encourage a learner to utilise his linguistic knowledge, and his background knowledge to comprehend better
the meaning and its message. In this context it is apt to view a few theories of multimedia learning.

2.6.3.1. Cognitive Flexibility Theory

As an alternative to the use of information processing theories a few Computer Assisted Language Learning (CALL) researchers have been influenced by cognitive psychology, and have adapted certain models to the context of Second Language Learning (SLL) in a multimedia environment.

In Cognitive Flexibility Theory (Spiro and Jehng, 1990; Spiro et al., 1992) believe that examining a concept from more than one perspective increases comprehension of the concept itself, and also the ability to transfer that understanding to other domains. This means that presenting material in a variety of forms is likely to have a positive effect on learning as well as comprehension. Multiple representations are the primary aspect of this theory, and implementing multiple teaching strategies in a learning environment supports this theory. Coming to an image or idea from several directions reinforces both the new idea, and the concept found in the text, because the link forms a new bond between the two otherwise unconnected concepts. Similarly, traditional teaching, aided with a multimedia link, forms bonds to increase comprehension. Besides prior knowledge, visual representations also aid comprehension.

2.6.3.2. Cognitive Theory of Multimedia Learning

Meaningful learning occurs when learners mentally construct coherent knowledge representations (Mayer, 1996). The cognitive theory of multimedia learning is based on three assumptions suggested by cognitive research: (1) dual-channel assumption – the idea that humans have separate channels for processing visual or
pictorial representations and auditory or verbal representations (Baddeley, 1998; Paivio, 1986), (2) limited capacity assumption – the idea that only a few pieces of information can be actively processed at any one time in each channel (Baddeley, 1998; Sweller, 1999), and (3) active processing – the idea that meaningful learning occurs when the learner engages in cognitive processes such as selecting relevant material, organising it into a coherent representation, and integrating it with existing knowledge (cited in Mayer and Moreno, 2002).

According to Mayer and Moreno’s (2003) Cognitive Theory of Multimedia Learning (CTML), meaningful learning is active studying in which the learner possesses, and uses a variety of cognitive processes to make sense out of the presented information. The major cognitive processes that lead to meaningful learning include selecting relevant information, organising that information into coherent representations, and integrating these representations with existing knowledge. This assumption supports a dualcode hypothesis according to which teaching learners about a causal system in both verbal (i.e., a description in printed words) and nonverbal codes (i.e., a set of graphics depicting the system), results in stronger encoding than teaching them with a verbal or nonverbal code alone.

Figure 2.9 summarises the cognitive theory of multimedia learning. Narration enters via the ears, so the learner selects some of the words for further processing in the verbal channel, organises the words into a cause-and-effect chain, and integrates it with the visual material and prior knowledge. Animation enters via the eyes, so the learner selects some of the images for further processing in the visual channel, organises the images into a cause-and-effect chain, and integrates it with the verbal material and prior
knowledge. According to this theory, the cognitive process of integrating is most likely to occur when the learner has corresponding pictorial, and verbal representations in the working memory at the same time. Instructional conditions that promote these processes are most likely to result in meaningful learning. Therefore, this theory predicts that multimedia presentations (such as narrated animation) are more likely to lead to meaningful learning than single-medium presentations.
Fig. 2.9 A Cognitive Theory of Multimedia Learning by Mayer and Rosano (2002)
2.6.3.3. Generative Theory of Multimedia Learning

Mayer (1997) in his ‘Generative theory of multimedia learning’ has informed that when “learners select relevant visual and verbal information from what is presented, organise the pieces of information into coherent visual and verbal mental representations, and integrate these newly constructed visual and verbal representations with others” they attain a meaningful comprehension. The pictorial information provides a basis for interpreting the words and the phrases in the passage. i.e. when one reads the passage in the context of appropriate pictures it becomes clear by providing concrete referents, and the theme centres around a unique problem of communication.

2.6.3.4. Symbol Systems Theory

Salomon (1977) in the ‘Symbol system’ states that each medium is capable of conveying content via certain inherent symbols. Salomon also suggests that “television requires less mental processing than reading and that the meanings secured from viewing television tend to be less elaborative than those secured from reading (i.e., different levels of processing are involved). However, the meaning extracted from a given medium depends upon the learner”. The linguist also argues that schema plays a major role in determining the manner in which messages are perceived, and later interpreted to form the mental image. Complementing the schema, media can help in creating the new schema which affects the subsequent cognitive processing. In this context, human language is seen as an interaction between the symbol system and the mind.

The symbol systems theory developed by Salomon is intended to explain the effects of media on learning. “To summarise, the symbol systems of media affect the acquisition of knowledge in a number of ways. First, they highlight different aspects of
content. Second, they vary with respect to ease of recoding. Third, specific coding elements can save the learner from difficult mental elaborations by overtly supplanting or short-circuiting specific elaboration. Fourth, symbol systems differ with respect to how much processing they demand or allow. Fifth, symbol systems differ with respect to the kinds of mental processes they call on for recoding and elaboration”. (Salomon 1977) Thus, symbol systems partly determine the amount of knowledge from specific kinds of messages.

Further, Salomon (1979) suggests that combinations of four elements that determine a medium’s qualities are: the technology; a particular content domain; the situation where it is used and specific symbol systems. These combinations are an attempt to match the learner’s needs, and characteristics with the medium’s attributes, and content domain. Salomon views the film as a “whole message unit that communicates through orchestration and compounding within symbol systems and multiple- symbol-systems episodes”.

To conclude, the above mentioned theories substantiate that learners learn more deeply from animation and narration than from narration alone. The theoretical rationale behind these theories is that learners are able to build better mental connections between corresponding words and pictures when both are presented (i.e., animation and narration) than when only one is presented (i.e., narration), and the learner must mentally create the other. The advantages that promote learner’s understanding can be seen in the following principles. (Mayer and Moreno, 2002)
Spatial Contiguity Principle

This principle states that learners learn more deeply when an on-screen text is presented next to the portion of the animation that it describes than when an on-screen text is presented far from the corresponding action in the animation. The theoretical rationale is that learners are able to build better mental connections between corresponding words and pictures when they are near each other on the screen. In contrast, when they are not near to each other, learners must waste limited cognitive capacity in searching for the portion of the animation that corresponds to the presented text.

Temporal Contiguity Principle

In this principle, learners learn more deeply when corresponding portions of the narration and animation are presented at the same time than when they are separated in time. The theoretical rationale is that learners are able to make better mental connections when corresponding words and pictures are in working memory at the same time.

Coherence Principle

According to this principle, learners learn more deeply from animation and narration when extraneous words, sounds (including music), and video are excluded rather than when included. The theoretical rationale is that learners may attend to the irrelevant material, and therefore have less cognitive resource available for building mental connections between relevant portions of the narration and animation.

The visual element, therefore enables the learner to experience authentic language, aid comprehension, and retain the concepts by contextualizing language. For example, in the play ‘Othello’, Iago takes revenge on Othello, who was the General of
the Army. Iago plans with Roderigo, another Venetian to execute the plan. The sequence of events in which Iago exploits Roderigo as a bait to trap Othello could be imagined, and appreciated more with the visuals, as the utterances are rather vague, and dense to comprehend as second language learners. Hence, it is not only the visual element but the network of interactions between verbal and non-verbal components that leads the readers to full comprehension of the situation. This duplication makes the linguistic elements more meaningful, and the message clear to the learners. Further, Authentic video programmes can immerse the language learner into the social and cultural life of the native speaker; because the language used is the real language i.e. the colloquial language used by the native speaker in his day to day affairs.

Further, it acknowledges that reading is not confined to traditional print materials but extends to the texts learners encounter daily, including the nonlinear, interactive, dynamic, and visually complex materials conveyed via audiovisual media (Alexander and Jetton, 2003).

Knowledge of the various issues discussed informs that reading is a complex activity. Reading any material, be it a newspaper, a magazine or a text, the goal of any reading process should lead to comprehension. This comprehension could be made easier, and comfortable with the help of visuals, animation or illustration. Hence, this study advocates the use of visuals as a complement to the process of comprehension.

Multimedia offers teachers access to various forms of interactive educational material for teaching. As a result, learners can now interact with the diverse forms in multimedia, and properly structure their schemata of conceptual knowledge. The important aspect of integrating multimedia successfully into a content area depends on the manner,
the teacher incorporates its use into the overall design. Therefore, a discussion of multimedia software for language learning and teaching as drill and practice, tutorials, games, simulations, discovery learning and problem solving (Abdi Kazeroni, 2002) are highlighted from the perspective of the type of software, the role supported by the respective software, and its conception in the second language teaching-learning situation.

Table No: 2.1 shows the software categorisation for language learning and teaching.

### Table 2.1. Software Categorisation for Language Learning and Teaching

<table>
<thead>
<tr>
<th>Ser. No:</th>
<th>Type of software</th>
<th>Supposed role</th>
<th>Conceptions of second language learning</th>
<th>Conceptions of second language teaching</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tutorials</td>
<td>Tutorials introduce new content to be learnt in a very organised, and linear manner. Content is fixed and cannot be modified.</td>
<td>Generally speaking, learning is seen to be linear and cumulative. Linearity is assumed to present language as a succession of rules or items to be learnt through practice while avoiding 'deviant' forms, and consequently by passing interlanguage development. Learning is decomposed into small chunks. It must be noted that CD-ROMs with hyper-navigation possibility follow the same assumptions.</td>
<td>Teaching is based very sequentially. Teaching is only efficient if: a) there is a progression in difficulty; b) it can be organised in 'one thing at a time' manner.</td>
</tr>
<tr>
<td>2</td>
<td>Exercises ('drill and practice')</td>
<td>Exercises help revision and 'mastery' of language while very often 'avoiding' error.</td>
<td>Learning is supposed to be linear and error must be avoided. Learning is only efficient if: a) the content is split into small chunks, question-response, and evaluation, b) it respects the order in which the content is presented.</td>
<td>Content must be thought in predetermined stages. An order of difficulty must be established. The learner must proceed from simple to complex concepts.</td>
</tr>
<tr>
<td>3</td>
<td>Games</td>
<td>This category can be divided into categories: a) Games for native speakers that are used as authentic documents for L2 learners; b) Games designed for L2 learners with competitive elements.</td>
<td>'Fun' is seen to be a vital factor in learning an L2 for two main reasons. 1. Games are assumed to reduce anxiety. 2. Concentrating on finishing the game is deemed to be sufficient for learning to occur. Learning can only take place implicitly.</td>
<td>Teachers must create a relaxing atmosphere in which games and 'fun' activities are the key to success.</td>
</tr>
<tr>
<td>4</td>
<td>Strategic training</td>
<td>The aim is to show how learning can become more efficient.</td>
<td>Strategies and learning processes are transferable from one individual to another, and thus can be reproduced. It is sufficient to observe 'good language learners', and pass on their strategies to other L2 learners.</td>
<td>Teaching is based on the assumption that L2 learning strategies and processes can be reproduced. Teaching should create the conditions so that learning strategies are acquired.</td>
</tr>
<tr>
<td>5</td>
<td>Discovery</td>
<td>The learner is exposed to situations/context from which language rules are inferred. The learner must consciously get involved. The learner must formulate hypotheses that will be tested, and then either confirmed or rejected. Reflections on the part of the learners play a significant role. Learning can take place explicitly.</td>
<td>Teaching is only efficient if the learner is an active participant in a heuristic process. The teacher's role is to enable learners to discover language rules on their own.</td>
<td></td>
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<tr>
<td>6</td>
<td>Simulation</td>
<td>Simulation programmes: 1. offer the learner the possibility to engage in decision making; 2. focus learner's attention on task completion. Learning is seen to be efficient if learners engage in activities that encourage them to 'interpret' language. Learners must transform input into comprehensible input with the help of context so as to solve a problem. Learning can be organised explicitly or implicitly.</td>
<td>The teacher should be able to organise input so that learners (individuals or group) can comprehend it, and solve problems.</td>
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<tr>
<td></td>
<td>Concordan cers</td>
<td>These tools provide huge text-based data bases enabling the learner to see language in context.</td>
<td>The learner must formulate, test and confirm or reject hypotheses at word level, or sometimes at the structure level. Learning is explicit.</td>
<td>The objective of teaching is to provide the learners with a tool enabling them to discover the L2.</td>
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<tr>
<td>8</td>
<td>Authoring systems</td>
<td>Authoring systems are intended to be easy-to-use tools that help the teacher to create a variety of the above mentioned learning activities.</td>
<td>The conception of L2 learning depends on the creator’s decision.</td>
<td>The concept of teaching which is very much ‘normative’ depends on limited activities.</td>
</tr>
<tr>
<td>9</td>
<td>Online chats</td>
<td>Learners can engage in text or audio communication either in a synchronous or asynchronous mode.</td>
<td>Learning is efficient if it is organised around verbal, and social interaction between at least two interlocutors. This would mean that there is ‘negotiation of meaning’, that input has become comprehensible, and that there is output.</td>
<td>The priority of the teacher is to give learners the possibility to engage in verbal and social interaction. Teaching must be organised around a task to be completed.</td>
</tr>
</tbody>
</table>

In this context software programmes are used as tools to deliver instruction effectively, and efficiently for language learning and comprehension.

2.7. Conclusion

In the beginning of this chapter, it has been mentioned that getting meaning from printed words involves a two-step process: First, the printed words must be decoded; second, the decoded words must be comprehended. Reading is an act of communication in which information is transferred from a transmitter to a receiver. It (reading) is not a
passive activity-the reader must make an active contribution if one is to acquire the available information. To create an awareness of this process, the various views on reading, the theories of reading, and the models of reading were discussed. This is followed with an explanation of the strategies needed to aid the instructors in their teaching process and the background knowledge, as pre-requisite criteria for comprehension. The absence of this background in the reader's mind can be complemented with the role of multimedia, as proposed by the various theories of multimedia, and finally, the advantages of a multimedia environment are discussed as principles to an enhancement of reading comprehension. The following chapter deals with the Review of related literature.