CHAPTER 2

PERSPECTIVES ON THE EXISTING SITUATION

2.0 Introduction

This chapter contains three major sections dealing with

(a) a description of the existing lecture situation at the college level;

(b) the lecture based mode of instruction - a formal analysis, processes involved in understanding speech and an examination of the extent to which these are applicable to the classroom situation; and learning strategies explained;

(c) review of research in the area.

The sub-sections that follow discuss

(a)  i. higher education and the medium of instruction;
     ii. the roles of teacher and student in the existing classroom situation;
     iii. the mode of presentation - lecture;
     iv. higher education and a student-centred approach;
     v. communication in the lecture context;

(b)  i. stages in information processing;
     ii. general listening and listening to lectures, similarities and differences;
iii. other psychological factors involved in information processing;
iv. comprehension and the relevance and use of learning strategies;
v. abilities involved in comprehension of lectures; and

(c) previous research in the area.

2.1 Higher education and the medium of instruction - English

As the study deals with students receiving college education, it is necessary here to discuss the question of the medium of instruction. Both at the postgraduate and undergraduate levels English is still used as one of the mediums of instruction in teaching different subjects. English is used for imparting input, i.e. subject-specific information. In a situation where students are exposed to lectures in English during most of their college hours, a capacity for comprehension and acquisition of information is essential. The low proficiency level in English of those students coming from regional medium backgrounds is an issue to be considered seriously.

To trace the history of English as the medium of college instruction, from 1917 to 1947, English was the sole medium of instruction at all levels. It was only from 1947 onwards that there were considerations for regional medium of instruction though most of the college level instruction was through
English. This created problems for students going in for higher education from regional medium backgrounds. According to Gokak (1964) the main problem in higher education in India is that of a transfer to the English medium in the Pre-University year. The result, he stated, is a deterioration in the quality of higher education.

However, according to the Kunzru Commission report (in Gokak, 1964), since most university people were of the view that "the change from English to an Indian language as the medium of instruction at the university stage should not be unduly hastened", "English will continue as medium of higher instruction so long as the modern Indian languages are not well-equipped to replace it" (Gokak, 1964). Even when English is replaced by a regional language as the medium of instruction at the college level, English will continue to be studied as a second language for many years to come. According to the Report of the Study Group on the Study of English in India (1967), supplementary reading in English is essential for University students in order to be proficient in their special subjects.

2.2 Teaching English at the college level

Coming to teaching of English at the college level, it is doubtful whether teaching the language skills as a conscious aim was ever the focus. According to the report titled 'Syllabus Reform in English' (1976-77),
"some features of the situation which cause concern are -

(a) the teaching at the degree level remains substantially unaltered,

(b) there seems to be some confusion about the nature and purpose of teaching at the degree level."

The teaching of English at the college level presents a different set of problems especially with those students coming with very little knowledge of English.

"Much time has to be devoted to repairing the damage done or in building the foundations that are necessary for the minimum essential use of this language at the undergraduate and postgraduate stages."

(Report of the Study Group, 1971)

The teaching of English in colleges "will have to emphasize expression as much as comprehension" (Gokak, 1964),

"The skills of communication, oral as well as written, both expressive and receptive will continue to be at a premium, and teaching will have to try to impart a certain minimal competence in these skills."

(Syllabus Reform in English, 1976-77)

2.3 The profiles - teacher and student

It is necessary to briefly describe the roles of the teacher and student in the typical classroom at the college
level. The Report of the Education Commission (1964-66) states that most of the teaching has been dominated by an outdated syllabus. Therefore undue importance is placed on selective cramming. According to the report, the situation is further aggravated by the great amount of time that both students and teachers spend in formal classroom contacts leaving very little time for independent study by the students and lecture preparation by the teachers. Most of the teachers at the undergraduate level are proficient in their own subjects but are not adequately trained in the teaching of these subjects. Most often they do not seem to have problems with the language, but very often their presentations are disorganized and difficult to understand. As pointed out in the Radhakrishnan Report (1948-49), the primary responsibilities of the teacher are to (a) arouse interest in the student and (b) stimulate the spirit of enquiry and of criticism. These responsibilities do not seem to be accepted by the teachers at the college level. Firstly, teachers do not seem to be given much attention to how much of what is presented in different subjects is being acquired by the students. The pressure of completing the syllabus most often rushes them through their courses. Secondly, they do not seem to be aware of any strategies that students could be asked to make use of in comprehending lectures. They are concerned only with the presentations of factual information related to their subjects and expect students to acquire as much information as
possible from the lectures. Thirdly, teachers hardly encourage student participation or interaction of any sort in the classroom. In the existing situation it is difficult for the students to learn or acquire as much as they ought to form instruction.

As the undergraduate level, English to most of them is the medium of instruction for imparting subject information. The extent to which they comprehend the information presented is not known. Generally the students are passive listeners.

According to the Report of the Education Commission (1964-66), the students at the tertiary level are generally ill-prepared for serious academic work as they have little experience of independent study, learning being mainly a matter of mechanical memorisation. Their main duty is to attend un-interesting lectures delivered in English which they do not understand adequately, states the report.

2.4 The lecture-based mode of instruction - a formal analysis

Some of the facts and impressions relating to the tertiary level instruction were summarized above. Since the present study seeks to find suitable training inputs to help students improve their effectiveness, a conceptualization of the learning process is necessary. What is discussed below is admittedly an
idealized representation. However such a theoretical model is necessary to promote a conceptual framework for the study.

2.4.1 The lecture and its purposes

The lecture is the chief mode of presentation at the undergraduate level in colleges and will remain as one for many more years to come. A total change in the presentation mode is not feasible though some modifications in the conventional lecture method are possible. In almost all the disciplines in arts, lecturing is used with slight variations in the lecture style in some of the subjects. In a typical lecture class different subject teachers present information on their topics for about fifty minutes without discussions or interactions of any sort. Students are expected to listen and comprehend.

2.4.2 What a lecture is

Before going on with the different aspects of a lecture, it is necessary to review what educationists have to say about lecturing. Researchers have pointed out that lecturing is probably not on balance as effective as small-group teaching for complex problem-solving or for changing attitudes. But for imparting ideas and information, lecturing is about as effective as other methods of teaching (Bligh, 1972). According to Bligh (1972), the main objective of a lecture is to convey information and not to promote or develop thought or to change
lecture generally contains all the important points related to the topics, prepared for the students. Secondly, a lecture makes information much simpler than some of the texts for the students. As they deal with topics related to students' optional subjects, they are relevant. Also, lectures have the potential of supplying great quantities of information. Finally, listening to lectures involve exposure to long academic discourse on different subjects, which serve to facilitate comprehension.

2.4.4 Types of lectures

Lectures are generally long uninterrupted expository talks on different topics presented by the teacher without referring to a text or notes in class. At the undergraduate level, in most of the arts disciplines, presentation is in the form of a lecture. Explaining, which is a slight variation from a lecture, is also used in some subjects. Different types of lectures are generally discussed when talking about lecturing as the mode of presentation. Three types of lectures identified by Bligh (1972) are:

1. a descriptive lecture, which facilitates clear presentation of facts and is suited to the main functions of regular lectures, i.e., teaching information for surveying an area of knowledge before its study in greater detail. It conforms to the hierarchic form of classification or to a chain of narrative:
2. the problem-centred lecture, where the teacher asks a question or presents a problem and then gives the information, arguments and hypotheses as possible solutions, so that everything that is said focuses on the initial problem. There the student is required to think in order to follow the reasoning. All problem-centred lectures contain a statement of a problem. A necessary condition of success with this method is a clear brief statement of the problem; and

3. the lecture-discussion method which makes students think, forces them to relate the subject to their personal experience, and encourages students to participate in discussions.

Some of the other types mentioned by Brown (1978) are:

1. The classical type, where a lecture is divided into broad sections and sub-sections. Each sub-section contains a key point and a brief summary. This type is the easiest to make notes from and useful for outlining the main features of a topic.

2. The sequential method has a series of linked statements which lead to a conclusion. This type is generally appropriate for historical accounts and to describe the main themes of a work in Literature.

3. The comparative method, in which comparisons of two or more processes, themes, works or ideas are focused on.
4. The thesis method, which begins with an assertion and proceeds to justify it by bringing together a wide range of evidence and argument which may be presented in major sections or in a problem form. This set of categories reveals the underlying structures and purposes of different types of lectures.

As mentioned earlier, explaining is also one of the activities of a teacher. According to Brown (1978) - "explaining is at the heart of teaching in higher education just as its obverse, understanding, is at the heart of learning." Explanations contain many of the elements of lectures and like lectures require preliminary analysis and preparation and careful attention to structure and presentation. The quality of an explanation depends on the degree of understanding it generates in the students. Brown (1978) mentions three main types of explanation, the 'interpretive', the 'descriptive' and the 'reason-giving'. They approximate to the questions 'what', 'how', and 'why'. Interpretative explanations specify the central meaning of a term or statement or they clarify an issue. Descriptive explanations describe processes, structures and procedures. Reason-giving explanations involve principles or generalisations, motives, obligations or values. Very few lectures and explanations in the classrooms at the undergraduate level can be categorized under any of the above mentioned types except
the descriptive lecture, though features of the types given are occasionally present in some lectures.

2.4.5 The micro-skills or abilities involved in comprehending lectures

For an adequate overall understanding of a lecture, the following micro-skills are needed. Students will have to be able to -

(1) identify the topic, its purpose and follow topic development,
(2) follow sequences, comparisons, cause and effect relationships,
(3) identify relationships among units within discourse, e.g., hypotheses.
(4) make inferences from the facts presented, i.e., infer supporting details, relationships, cause-effect and conclusions,
(5) recognize key lexical items related to the topic,
(6) deduce meanings of words from the context,
(7) interpret the information presented,
(8) make comments on the facts presented and express opinions,
(9) understand problems related to the topic,

(10) detect attitude of the speaker on the topic,

(11) recognize markers of cohesion and role of discourse markers in signalling the structure of a lecture and introducing an idea, transition to another idea and concluding an idea,

(12) identify the main points by verbal cues,

(13) identify moves and modes in discourse. Moves will include preambles like um--er, today etc., frames of the sub-topics like now ..., so far ..., key statements, examples and summaries. Modes will include identifying the nature of a lecture, that is, if the lecture is defining, describing, classifying, reporting, comparing etc.,

(14) evaluate, i.e., make judgements of fact or opinion, adequacy and validity, appropriateness and acceptability,

(15) appreciate, i.e., make emotional response to the content, imagery, use of language etc.

The above micro-skills or abilities involved in comprehension could be categorized under three main headings. Firstly, the thinking skills, which covers the logical processes involved and activities related to memory and
concentration. Secondly, the creative skills which include the use of imagination, judgements and recognize relationships that lead to new ideas. Thirdly, the language selection skills which include the nature of the topic, the conventions of the spoken language and of the particular mode and the purpose of the speech.

2.5 **Lecturing and a student-centred approach**

At the college level students listen to lectures and are expected to learn as much as possible from these lectures and from textbooks and reference materials. The teacher mainly presents information through lectures and it is the students who are ultimately responsible for their learning. In this sense we could say that higher education i.e., at the undergraduate and postgraduate levels, has been and is mainly 'learner centred'. Teaching or teacher-centred learning has been mostly associated with primary and secondary education, i.e., at the school level.

In the history of higher education in India, however, a change from lecturing to teaching and to self-instruction and student-centered learning realized in a more meaningful way has often been suggested. But lecturing was and is still being used for imparting knowledge in colleges and universities. Teaching, which involves discussions, student
participation and interaction to some extent was occasionally used by some of the teachers. Today, at the undergraduate level, where lecturing continues to be the main form of presentation, students will have to be given training in the use of strategies that would help them learn more from the lectures. This would perhaps bring in student-centred learning into even lecture-situations.

In an approach that is student-centred, the learner is taken as the starting point for learning activities. "Learning by discovery ensures that a process much more like the widely respected process of scientific inquiry will take place" (Cohen, 1983). For Dewey, the notion of problems is basic. According to him, "thinking begins in what may fairly enough be called a forked-road situation, a situation which is ambiguous, which presents a dilemma, which proposes alternatives." According to Cohen (1983), in a learner oriented approach, the interests and desires of the learner are taken as the central factors in determining the educational process. The approach emphasises learner autonomy and self-direction.

Self-direction according to him applies particularly to the principle that the learner should choose his/her activities and determine the way they should be followed.

As the study basically concerns an attempt to bring about learning in a lecture situation, this section briefly discusses some of the key issues that the study would involve.
2.6 Communication in the lecture context

English, being the medium of instruction at the final year undergraduate level, is mainly used to convey subject-specific information to the students. Therefore, it is used as a tool for communicative purposes, i.e., getting the meaning or message of the information presented across to the students. In the given context, the function of the language is purely an instrumental one.

Communication is by definition a two-sided process: a message cannot be communicated unless there is someone to receive it. In this sense the existing classroom situation at the undergraduate level is communicative to some extent where the information presented through lectures is intended to be communicated to the students. The main purpose of a lecture is essentially to communicate the information to the students. Thus there is a kind of interaction between student and lecture content.

According to Richards (1983), there are five assumptions about the nature of verbal communication. They are:

1. Communication is meaning-based.
2. Communication is conventional.
3. Communication is appropriate.
4. Communication is interactional, and
5. Communication is structured.
The structured aspect of communication can be looked at from two perspectives:

a. Firstly, the macro-perspective, which reveals the differences in rhetorical organisation that reflect different discourse 'genres' like instructions, discussions or tasks;

b. secondly, a micro perspective, showing how some of the processes by which discourse is constructed out of different utterances are reflected in speech.

Coherence in a lecture would be determined by how appropriately the teacher deals with the level of description, the content, the order in which the items are described and the relations between items mentioned in the lecture.

2.7 Processes involved in understanding lecture as speech

'Comprehension' in the context of the study refers to processing information from the spoken discourse, namely lectures. Some of the important aspects of cognition which are involved in the processing of information are memory, retention and recall, perception and attention. Comprehension is best understood as processing information which forms a part of the learner's preliminary intake. Understanding in verbal communication is a construction process, according to
M. Rost (1990). This construction process has relation to 'relevance theory' (Sperber and Wilson, 1982, 1986) which places the main responsibility on the listener for understanding.

Some of the important psychological factors influencing comprehension are motivation, interest, attitude, state of readiness, background knowledge and study habits of the learner. Besides, the other variables involved are

(a) the features of spoken discourse;

(b) the processing strategies; and

(c) the overall perspective of the subject.

2.7.1 Stages in information processing

According to the theory based on Broadbent's (1962) information processing model, the following basic cognitive processing mechanism is involved in comprehension. The listener first takes in raw speech and holds an image of it in short term memory till the bits of information are tied together. An attempt is then made to organise the content into different sections by identifying their content and function. As sections are identified, they are next used to reconstruct propositions, grouping together to form a coherent message. Finally these propositional meanings are held in long term memory with a change in the form from the original. The general pattern is that a listener holds decisions
until he sees what is coming which then permits him to go back over what has been said in order to give it a final form. The listener constantly develops more or less specific anticipations for what will come next, based on the early part of the message. It is these anticipations that help the listener in comprehending further information that come in. Thus the main stages involved in information processing are:

1. initial stages of perception of input;
2. subsequent stages of encoding of the information into long term memory; and
3. series of stages by which learners fully integrate information into their knowledge structure. This process is referred to by Chaudron (1985) as a continuum from preliminary to final intake.

The listener understands a message by selecting information that specifies it as an event and the information that specifies content and meaning. The more information there is the easier this task becomes. The listener chooses what he wants by concentrating on it. This is the kind of selective listening that a listener does most of the time. This sort of selectivity is inherent in the very process of acquiring information. According to Broadbent (1962),
attention behaves very much like a filter. "Some signals are 'passed' for further processing while others are rejected. It is only the attended message that is processed for meaning" (Treisman, 1960). As a learner's capacity for processing information is limited, there is the need for selectivity and focused attention on the message presented. Neisser (1967) has referred to it as focal attention and Broadbent (1962) as the selective system.

2.7.1.1 Auditory processing

In auditory processing, the preliminary phase is followed by an active constructive processing mechanism. This active process is the mechanism of auditory attention according to Neisser. The following diagram will make the processes involved clear.

How the information is processed is shown in a diagram of Broadbent's filter theory (1962).

Table 1

<table>
<thead>
<tr>
<th>Selective</th>
<th>Limited capacity</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input → filter or attention</td>
<td>decision channel</td>
<td>→</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Long term storage</td>
</tr>
</tbody>
</table>
Auditory processing (includes auditory memory). The concept of speech processing memory is similar to auditory memory.

Table 2

<table>
<thead>
<tr>
<th>Short-term memory</th>
<th>to</th>
<th>Long-term memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Holding an image of the speech</td>
<td></td>
<td>Holding propositional meanings</td>
</tr>
</tbody>
</table>

**Processing Mechanisms**

1. Relatively passive
2. Preliminary analysis

Organising what is heard into sections and identifying their content

Active processing mechanism

Sections are used to reconstruct propositions to form a coherent message.

(This probably is the stage when input gets transformed for transfer into long term memory)

Controlled process (initial)
Regulates the flow of information from short term to long term

Automatic process (advanced)
Develops as the learner becomes more familiar with the situation

needs more attention

Top down  Bottom up

attention is eased
Short term

Information seems to decay rapidly if processing strategies for transforming of information for transfer are not used.

Echoic memory (passive) (synthesis that occurs while the input continues)

a) Continuous
b) Composed of sounds
c) Seems to decay rapidly

Processes and functions

1. Rehearse and process information temporarily. Retain information for immediate use and decision making.

2. Compare, retrieve from long term storage for analysis, decision-making.

3. Transform, organise information.

4. Transmit to long term storage to establish learning.

Long term

Information remains with the help of rehearsal

Non-echoic or active verbal memory (synthesis that occurs later)

a) Segmented
b) Composed of speech
c) Can be reviewed through rehearsal

Functions

Store information permanently. Make information available for future use, aid in anticipation, expectancies and perception.
Different aspects or parts of information that are attended to and selected are passed on from short term to long term storage. Before the information is transferred, it probably goes through several processing stages of which two are very important. The first is a relatively passive stage during which some speech units are tentatively identified and the second, an active process which forms meaning out of them (see diagram). It is at this stage that information gets transformed into long term memory store and the transfer is regulated by the controlled processes. Thus short term memory for auditory input is an important component of speech comprehension. Automatic processing develops as the learner becomes more familiar with the situation. Thus controlled processing can be said to lay down the stepping stones for automatic processing as the learner moves to more difficult levels.

As seen in the diagram, during information processing, the information received is first stored in the short-term memory or echoic memory. Since the short-term memory is limited, important information has to be extracted from it by calling up the necessary knowledge from long term storage and applying the necessary interpretive processes on it. Once the active processing mechanism works, there is an organised series of information which must also be stored in the long term memory. This is also referred to as an
active verbal memory. Segmenting, grouping, recording are essentially forms of auditory synthesis. These mechanisms take information out of echoic storage and put it into the system called active verbal memory. The active process in the verbal memory is often called 'rehearsal'. Similar process is seen in the communication model of Carroll and Freedle (1972).

Table 3

Intensive behaviour of the speaker $\rightarrow$ Encoding behaviour of the speaker $\rightarrow$ Message $\downarrow$
Decoding behaviour of hearer

Interpretive behaviour of hearer

Here the decoding behaviour of the hearer is when information is in short term memory and interpretive behaviour is when knowledge from long term memory is also used. The distinction between echoic and active memory is that one is passive, the other active, one is continuous, the other segmented, one seems to drag rapidly, the other can be renewed through rehearsal. Both seem to be basically auditory. Information stored in long term or semantic memory is restricted in a form that is essentially different from the form in which it
was first learned. Most of what goes on in a learning situation is a reorganization of semantic memory.

2.7.1.2 Interaction between the input (speech) and learner's cognitive structure

According to Bartlett (1932) the incoming information is integrated into a learner's existing mental structure but at the same time the new information modifies the organisation of the existing structure. His findings made it clear that when meaningful information is to be remembered, it is the active coding processes that make it possible to select, scan and modify the received information. The precise form taken by such coding operations depends largely on the structure of knowledge and the mental operations possessed by the learner. A similar point is raised by Widdowson (1984) in the context of language acquisition, where he refers to the 'capacity' of the learner, i.e., the learner making his/her knowledge of linguistic rules work by using them in relationship to the situational and linguistic context. The same operation could be applied for acquiring subject knowledge, where the structure of knowledge and mental operations possessed by the learner would help in the act of processing. Comprehension can be facilitated when there is correspondence between the form of the spoken discourse and the cognitive structure of the learner. Comprehension can be aided by the use of relevant, previously learned ideas as a basis for incorporating
new information. New learning depends on how past learning is organised. In Ausubel's (1968) subsumption theory, learning is said to occur as a result of an active integration of new information with students' cognitive structure. According to Ausubel, this process results in "meaningful learning". Thus the main steps involved in comprehension of input according to Brown and Yule (1983) are the following:

1. Comprehension takes place when input and knowledge are matched against each other.

2. The matching process can take its point of departure either in the input or in the learner's knowledge (Bottom-up and Top-down).

3. Comprehension is selective because of the gaps between input and knowledge, and the limited storage capacity of short term memory.

4. The existence of gaps between input and existing knowledge, and the selective operation of the central processor, account for the fact that comprehension is typically partial rather than total, understanding being achieved when the learner arrives at a reasonable interpretation of the input.

There is therefore a strong relationship between comprehension and memory. According to Neisser (1967),
objects and responses are recalled after an elaborate process of reconstruction takes place, which makes use of relevant stored information. He states that reconstruction is based on the information which possibly consists of traces of prior process of construction.

2.8 General listening and listening to lectures -- similarities and differences

The above mentioned processing mechanisms generally apply to all listening situations and so are also relevant in a lecture situation. However, the kind of listening that a learner in a classroom situation does is different from listening in other situations, for example, when listening to a conversation or discussion. This distinction is made by Rost (1990) between transactional discourse, i.e., listening to lectures in different subjects and interactional discourse when listening to a conversation. Before going on to relating the cognitive processes involved in understanding to the learner in the classroom, some of the similarities and differences in listening in these two situations need to be mentioned. The basic processing stages, though normally associated only with listening in situations, different from the listening done by the learner in the classroom, are the same in both situations. The general process which involves the transfer of information from short term to long term memory storage through controlled and automatic processes
applies to both the general listener and the learner in the classroom. A listener decides why she/he is listening i.e., basically the purpose of her/his listening. Secondly he predicts some of the information he/she expects to be included in the input. Thirdly, he/she assesses how much of that information is likely to be new to him/her and how much and what she/he thinks she/he already knows about the subject. Finally, she/he refers back to the first point and decides how much of the message is likely to be relevant to that purpose. This tells him/her what to ignore and what to select.

There are two main differences between the two situations. Firstly, while the listener in conversations or discussions listen to relatively shorter pieces of dialogues, the learner in the classroom listens to extended lectures in different subjects. In a classroom situation, the learner is exposed to long academic discourses. Listening in this situation is bound to make higher demands on a learner's comprehension. But it is also true that the longer the text the more chance there is of the listener's being able to establish a context, as more and more information relevant to the context is added during the discourse (Brown, 1986). In listening involved in a lecture context, there is the principle of meaning operating. Here meaning is created by the listener within a personal knowledge domain (M. Rost, 1990). The listeners background knowledge controls to a great extent what he/she understands of a subject. However such long discourses are intimately
connected to memory. According to Garrod (1986), "all interpretation must occur rapidly while listening to continuous speech." Research has supported the fact that

"the referential significance of an utterance is established during its initial comprehension, and not determined after a more local semantic analysis has been completed."

Garrod, 1986, pp.226-238

This is another problem faced by a listener in the classroom. Memory in natural settings, such as the college classroom acts very differently from memory in a laboratory or other conversational settings. The components generally connected with memory are

(a) tasks, i.e., of recognition and recall;
(b) content, which would include learning, associations and knowledge;
(c) process, i.e., organisation, intake; and
(d) retrieval of information, which would include verbatim gist, word finding and speech processing.

In long term memory, the amount recalled, and the errors in recall, depend largely on factors inherent in the structure organisation of the particular material and in the types of
coding performed on it. Secondly, the kind of content or the nature of the input would have a great influence on the processing of information. The nature of the input, in this case, topics belonging to different subjects, is important and would to a great extent affect a learner's processing of information. Thirdly, in a classroom, learners have limited speaking rights and thus cannot frequently interrupt the lecture when they suspect they are not comprehending.

In a lecture listening situation the initial stages of learning involve the slow development of skills as the learner attempts to automatize the various components of performance. Automaticity occurs when there is the application of appropriate control processes operating at the different information processing stages. If the skills are well acquired and permanent, information processing can be said to be automatic. Automatic processing involves the activation of certain nodes in memory every time appropriate inputs are present. This activation is a learned response that builds up through consistent mapping of the same input to the same pattern of activation. Controlled processing is not a learned response but a temporary activation of nodes in a sequence. This activation is under attentional control of the learner (B. McLaughlin, T. Rosseman and B. McLeod, 1983). Thus acquiring information entails going from the controlled to the automatic mode of operation. McLaughlin refers to
Schneider and Shrieffin's (1977) distinction between 'controlled' and 'automatic' processing. Controlled processing regains active attention, so that only a limited number of features can be controlled at a time. Automatic processing takes place without active control or attention. According to McLaughlin et al (1983), "automatic processes are learned following the earlier use of controlled processes." This is also found in Broadbent's processing model (see Tables 1 and 2).

It is this transition of information from controlled to automatic processing that is central to learning.

The transition is mainly achieved by two processes, one deductive and the other inductive. The first is referred to as top-down process and the second as bottom-up process. These are two basic processes involved in comprehension. Both these processes are sub-types of controlled processing directed at achieving automaticity.

(1) The bottom-up processing refers to the analysis of incoming information, categorising and interpreting that data on the basis of the information presented.

(2) The top-down processing makes use of higher level information, i.e., learner's prior knowledge to help in processing of incoming information.

Comprehension is interpreted as an interaction of these two processes.
2.9 Processes involved in listening to lectures

The general model of information processing which involves automatic processing in case of auditory listening has already been described. In this case the processing is however a general, unconscious, mental processing which would apply to all listening situations. Since the present study specifically deals with listening in a lecture context, which demands a very different set of skills and abilities, it would relate more to the cognitive processes involved in processing information from a typical lecture situation. Therefore a description of the different cognitive abilities involved in such a situation is relevant and necessary.

In listening to academic lectures at the tertiary level or listening to transactional discourse according to Rost (1990), listening involves a construction process which places the sole responsibility of understanding on the listener and his/her intentions. In the given situation listening ability is knowledge based. This means meaning is created by the listener. Within a personal knowledge domain, which includes the listeners background knowledge. This involves personal reinterpretation and reconstruction on the part of the listener. Meaning is created by the use of (a) pragmatic knowledge to estimate a sense of unknown items in order to make predictions about discourse events; (b) procedural
knowledge to perform tasks based on what is understood and (c) remembers and represents discourse meaning for use (Rost, 1990).

A listener's capacity to create meaning while listening to a discourse is similar to what Hodgson (1984) in Marton et al (1984) suggests. Hodgson says that the ability to reconstruct meaning is what a deep-approach is about. In deep approach listeners make use of their knowledge and skills. This would basically involve the intention of the listener, i.e., what is the listener looking for; the process, i.e., ways of achieving what the listener is looking for and the outcome (Marton et al. 1984). These are the components of an integrated whole. It is this deep approach, which is meaning based, that should be developed in the students. Therefore a holistic approach to materials is what is required of the students. To learn to organize the content into a whole is the main problem of learning to learn. Here the approach in a way presupposes a particular intention, a way of thinking about the treatment of the task and an attempt to organize the material (Swensson, 1984, in Marton et al 1984). The experience here is intrinsic, where students perceive learning as something that is bound up with themselves as individuals as against extrinsic experience of relevance (Marton et al 1984).
Understanding therefore in transactional or academic discourse is basically listener oriented and the traces of development can be seen in the listener's performance of some of the inferential processes through the use of certain editing strategies while listening. These editing strategies are -

1. Formulating propositional sense. Egs. - deducing the meaning of unfamiliar lexical items, inferring information not clearly stated, inferring links between two or more propositions etc.

2. Formulating a conceptual framework. Egs. - assigning a 'base conceptual meaning' to the discourse, supplying underlying links in the discourse etc.

(Rost, 1990)

The above stated processes presupposes a style of learning. According to Ramsden (1984) (in Marton et al. 1984) the two main styles of learning associated with the listeners are -

1. Comprehension learning which uses holistic strategies and

2. Operation learning which uses details and logical analysis.

For full understanding of any subject matter in a discourse context, both styles of learning need to be used (Pask, 1984, in Marton et al. 1984).
When looking at the processes involved in listening to lectures, tasks that actually make the listeners go through the stages of processing are important. Listeners attend to the requirements of tasks through different cognitive and learning strategies. In other words the learning strategies involve the use of these tasks. The cognitive strategies are -

1. Context implication (depend on contextual cues to generate links between propositions).

2. Generalization of ambiguous segment (assumes that an ambiguous segment is consistent with what is already known by using a principle of analogy).

3. Selection of inferences (relying on principle of discourse relevance, listeners identify lexical items and give preference to inferences based on these items) (Rost, 1990)

The tasks would however fit into the general framework for learning from a lecture situation. Rost (1990) identifies two types of tasks which relate to the two basic strategies presented in the study. These are the on-line task, which is a while-listening task and the retrospective task which is basically a post-listening task. One of the online tasks is the activity of note-taking, which focus on the procedure or process of learning. Listeners take notes in accordance
with their expectations for the tasks that follow and to compensate for their limitations of memory. Retrospective tasks require thought out responses after listening. These tasks require certain cognitive processes. These are

(1) verbatim representations (necessary for definitions, special terminology etc.);

(2) propositional representations (necessary for presenting gist of the text);

(3) schematic representation (necessary for presenting a text in a formulaic way);

(4) argument representation (necessary for accounting what the speaker is trying to do in the text).

(Rost, 1990)

The different sub-skills of the enacting skills that are so relevant in a lecture context are the following:

(1) selecting main points from information given for use in a task;

(2) recording information to be used in other forms - e.g. note-taking;

(3) identifying clarifications of topics and ideas;
(4) integrating information from text and other sources; and

(5) providing appropriate feedback to speaker.

These enacting skills involve both online and retrospective tasks at different stages of learning.

Table 4
processes involved in listening to lectures

Listener

Has a 'deep approach' to understanding/learning. This involves a holistic view to materials and is the result of 'intrinsic' motivation.

Involves in meaning construction process which is knowledge based. This involves -

- background knowledge
- pragmatic knowledge
- procedural knowledge
- knowledge of discourse meaning.

Uses editing strategies for performance of inferential processes while listening.

Uses cognitive and learning strategies for performing tasks, both while and after listening.

Performs tasks which involves the enacting skills.

On line tasks (while listening)

Retrospective tasks (post-listening)
2.10 Problems in comprehension of lectures as related to the main aspects of learning

The thesis tries to investigate the kinds of problems students have in assimilation of lecture information presented in different subjects. Since most academic lectures are loaded with factual information i.e., are content based, comprehension on the part of the students becomes difficult. Their problems are discussed in relation to -

1. learners' background knowledge on the content or subject matter,

2. manner of lecture presentation which would include the features of spoken discourse related to both subject specific concepts and general features,

3. learners' selective listening,

4. developing appropriate learning strategies in order to make use of lecture information, particularly the strategy of noting,

5. the nature of the content or subject matter.
2.10.1 **Learner's background knowledge**

The ability to understand a lecture is based not only on the learner's linguistic knowledge but also on his general knowledge of the topic and the extent to which that knowledge is used during the processing of input. For the students to comprehend input adequately, it should be comprehensible. Input becomes more comprehensible as students acquire relevant prior knowledge of the topic. Research in the field of adult education has shown that the better the listener is able to use background knowledge about either the content of the topic or the formal structure of a lecture the better he will be able to comprehend, to store in long term memory and to recall the information. The prior experience influences which background knowledge structures or schemata he will use when interpreting lecture information. Three components of background knowledge have been suggested:

1) prior knowledge in the content area of the lecture, i.e., context;

2) prior knowledge that the lecture is about a particular content area, i.e., familiarity; and

3) degree to which the lexical items in the lecture reveal the content area, i.e., the lecture's transparency.

(Carroll, 1984)
It is well known that meaning is not found solely in a lecture being presented; rather, it is constructed out of the interaction between a learner's activated background knowledge and what is in the lecture. If a learner does not use his background knowledge, a significant part of the listening process does not take place and therefore impairs the interpretation of meaning. Background knowledge relevant to the information being presented and awareness of situational and contextual cues leads to inferences which facilitate the process of comprehension. Prior experience and knowledge out of situational and contextual cues are referred to as factual knowledge. In the absence of adequate structural cues in the lecture, it is such factual knowledge that helps a learner comprehend the information presented. Even where there is sufficient structural cues, use of factual knowledge is important. It is easier to attend to a lecture when a learner is familiar with the subject matter. According to Schlesinger (1977), information is generally comprehended by means of the processes of structuring and semantic matching. Structuring is based on structural cues in the utterance, and semantic matching makes use of factual knowledge. Usually there is an interaction between these two processes.
2.10.2 Manner of lecture presentation

The second factor that influences a learner's information processing is the manner of presentation of the lecture. Discourse markers are used to highlight new information and repetition of previously given information. The sequence with which a lecture unfolds as a text and the way the significant features such as introduction, conclusion, etc., are clearly signposted, are important in the process of comprehension. This is what Brown (1986) refers to as external context of the discourse. Besides, the discourse-internal context is also important and should be used efficiently. The discourse-internal context

"must include what the speaker assumes to be common background knowledge about the content, and also include what has been established as shared information in the course of the discourse."

(Brown, 1986, pp.284-302)

2.10.3 Selective listening

Selective listening is especially relevant for a learner in the classroom as he generally listens to subject lectures of fifty minutes duration at a stretch. As a learner has a limited capacity for processing information, he has to be selective in focussing his attention. It is not possible for a learner to focus attention on all that is said by the
teacher. The nature of the subject matter has to be taken into consideration in deciding what to focus on. Selective listening is required when listening to specialized topics and attention has to be focused on certain important aspects of a topic or the theme. Thus the focus of attention would depend on the subject matter and the structure of the lecture.

2.11 Other psychological factors involved in information processing

It has already been noted that some of the factors that affect processing of information in the learner, in a classroom situation, are prior knowledge of the information being presented, and its application to the presented information, the time duration, the presentation of the lecture which include sequencing and the features of spoken discourse, the nature of the subject matter or topic and the use of appropriate learning strategies and activities. Besides these, some of the other major psychological factors that affect a learner's information processing abilities are interest, motivation, attitude, study habits, state of readiness and significance of the message.

Dewey (1933) has defined interest as "a form of self-expressive activity -- that is of growth through acting upon nascent tendencies." Interest is "an outgoing of the self" towards that which lies in the direction of the
organism's development. Interest is very closely linked to memory, especially so when considering the learner in a lecture classroom. It is well known that a student is likely to remember information if it is interesting. In a lecture situation where a student listens to long presentations on specific topics, it is all the more necessary to see that the students find them interesting.

Motivation and cognition are inseparable where remembering and thinking are concerned. A learner ought to be sufficiently motivated to be able to process information efficiently. In the present undergraduate classes, students do not seem to be sufficiently motivated, as most of them lack the drive, have a low level of aspiration for learning, and an inadequate need for achievement, which are some of the important variables involved in motivation. In order to make students more interested in their class work, the present study aims to focus on the content, in this case the subject matter being presented.

Study habits of the students can facilitate information processing to a great extent. In the existing classroom set up, pre-lecture and post-lecture activities can help in comprehension and ultimately in overall learning.
2.12 The role of the learning strategies

Information processing models indicate that information treated only at the short term stage is very likely to be forgotten. The use of appropriate processing strategies facilitates transfer of information from short term to long term memory. Information that does not get beyond the short term memory stage cannot become part of the learner's permanent store of knowledge. Learning is facilitated by the application of cognitive processing strategies at the short term memory stage of processing. In a lecture situation a student recognises the message but may not be able to remember it. This could be because the student is unable to concentrate on the crucial elements of the message long enough to rehearse them before moving on with the information. All his attention is taken up with recognition and identification. This operation is necessary, but it is not a sufficient condition for recall. The input has to be processed for transfer to long-term memory. In such a situation the use of learning strategies, both pre-lecture and during lecture, can help release attention or cognitive capacity for information processing that will transfer information from short term to long term memory storage. The post-lecture activities in class and at home will help in greater retention of information in the long-term memory storage. These activities will involve reviewing, revising, organizing, categorizing and synthesizing information.
As mentioned earlier, information in the long term memory remains with the help of rehearsal and the main function is to make information available for future use. Thus from an information processing perspective, a learner in the classroom is an active participant who constantly selects, transforms and integrates new information into his/her field of knowledge. The important cognitive strategy can be defined as the cognitive process that will facilitate transfer of information to be learned from short term into long term memory. The learning strategy of taking notes in class, would include other sub-strategies like reviewing by paraphrasing, analyzing and synthesizing the information presented. Processing information while it is in the short-term memory store so that it can be transferred to long term memory is crucial to learning. Learners ought to apply different learning strategies for better processing of information, i.e., the organisation of information so that it can be utilised in short term memory and transferred into long term storage. Understanding relations between elements reduces the amount of cognitive effort required to understand isolated bits of information. By dealing with related units of information more efficient processing becomes possible. Practice, rehearsal and familiarity with the materials make comprehension much easier. The taking of notes while decoding information from a lecture can be an important learning strategy.
2.13 Learning strategies - explained and their relevance

The term 'strategies' as they are referred to in the study has already been explained. They are conscious, cognitive steps that learners take to help them acquire information effectively. Learning strategies are those that learners or students employ as part of the process of learning, in this context acquiring appropriate information i.e., they are mental operations that learner uses to facilitate learning. In the context of language acquisition, they relate to "activities in which the learner may engage for the purpose of improving target language competence" (Bialystok, 1983). In the same way learning strategies could be applied to acquire subject specific information. They are different from teaching strategies as the student is able to exercise control over the strategy. "The key to the effectiveness of these strategies is the special kind of mental activity the strategies promote" (O'Malley et al, 1985, 1988). According to O'Malley et al. (1985), a study of the use of learning strategies identified the frequency of strategy use with tasks. One most frequently used strategy was that of note-taking. The frequent use of the strategy, which has the minimum conceptual manipulation, is of interest in that it indicates that students normally do not transform the information they listen to while taking notes. This suggests that they probably do it only at a later stage.
Learning strategies have been divided into two classes by Dansereau (1978), namely, the primary strategies and the support strategies. The primary strategies are used to operate directly on the materials. According to him, a student required to learn material must be able to identify the important, difficult portions of the material, apply techniques to comprehend and retain the material and subsequently recall and use the acquired information. The support strategies are applied to the learner himself; these would include techniques for establishing an appropriate learning attitude. The support strategies allow the primary strategies to flow effectively. Thus the two classes of strategies, the primary and the support, are similar to certain meta-cognitive and cognitive learning strategies, referred to below.

Learning strategies are one of the many other types of strategies that learners use. These consist of both reception and production strategies which involve learners' attempts to use information they have acquired efficiently.

Learning strategies are of two types. They are meta-cognitive strategies and cognitive strategies. These can be conscious or subconscious processes. Some of the meta-cognitive strategies are:
<table>
<thead>
<tr>
<th>Strategies</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Advanced organizers</td>
<td>Making a general preview of the organizing concepts in an anticipated learning activity.</td>
</tr>
<tr>
<td>b) Selective attention</td>
<td>Deciding to attend to specific aspects of the input.</td>
</tr>
<tr>
<td>c) Self-monitoring</td>
<td>Correcting one's speech or performance on a task for accuracy.</td>
</tr>
<tr>
<td>d) Self-evaluation</td>
<td>Checking the outcomes of one's own knowledge of information against an internal measure.</td>
</tr>
</tbody>
</table>

Some of the cognitive strategies are:

<table>
<thead>
<tr>
<th>Strategies</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Resourcing</td>
<td>Using language and subject reference materials.</td>
</tr>
<tr>
<td>b) Grouping</td>
<td>Reordering and labelling the material.</td>
</tr>
<tr>
<td>c) Note-taking</td>
<td>Taking down points from spoken and written materials.</td>
</tr>
<tr>
<td>d) Recombination</td>
<td>Constructing a meaningful sentence by combining known elements in a new way.</td>
</tr>
<tr>
<td>e) Using key words</td>
<td>Remembering a new word by generating easily recalled images of some relationship between the new word.</td>
</tr>
<tr>
<td>f) Contextualization</td>
<td>Placing a word or phrase in a meaningful content sequence.</td>
</tr>
<tr>
<td>g) Elaboration</td>
<td>Relating new information to other concepts.</td>
</tr>
<tr>
<td>h) Transfer</td>
<td>Using previously acquired linguistic and conceptual knowledge to facilitate a new learning task.</td>
</tr>
<tr>
<td>i) Inferencing</td>
<td>Using available information to guess meanings of new items, predict outcomes.</td>
</tr>
</tbody>
</table>
Some of the other possible cognitive strategies would be -

(a) simplification  
(b) commenting  
(c) interpretation  
(d) integration, and  
(e) practising.

Bialystok (1985) points out that

"Learning strategies are not different from learning processes. These two must be explained in terms of the same mental mechanisms -- their difference is rather one of degree."

"It is assumed that learning strategies reflect the ordinary processes of learning that occur whether or not the learner is attending to and deliberately manipulating them."

(Bialystok, 1985, pp.255-262)

The use of strategies then will be a variety of processes that are applied to the task of acquiring information. Therefore -

"learning strategies are activities undertaken by learners, whether consciously or not, that have the effect of promoting the learner's ability either to analyse the linguistic knowledge relevant to the language under study or to improve the control of procedures for selecting and applying knowledge under specific contextual conditions."

(Bialystok, 1985, pp.255-262)
2.14 The strategy of note-taking as an aid to comprehension

In the preceding discussion a number of learning strategies were noted, within the framework of the cognitive processes involved in the acquisition of information. In the present study a distinction is suggested between the common activity of taking down simple notes during lectures, and the more sophisticated strategy of taking (or constructing) selective and structured notes. The focus of the present study is in the latter skilled cognitive process, for which students do not generally have the capability. However, it is agreed that special training can be provided to develop the needed skills in students.

The strategy of taking notes from lectures is essential and considered an integral part in the existing undergraduate classroom situation. In such a situation it is one of the major strategies students most need. Learning from lectures involve listening to and noting down the information presented, and organising, revising and thinking about the information after the lectures. It is mainly acquiring information presented through lectures in different subjects. Therefore the focus has been on the activity and strategy of note-taking from lectures. This would also involve the use of other cognitive strategies like resourcing, grouping, recombination, using key words, contextualization, elaboration
and inferencing to some extent. In order to make use of the notes taken during lectures, the above mentioned strategies would have to be used. The activity of note-taking would then act as a strategy of note-taking. Therefore in the empirical work, the emphasis has been given on the activity and strategy of note-taking which incorporates the other strategies given above. This is similar to what Rost (1990) refers to as on line task, i.e., note-taking while listening and retrospective task which is after listening with a focus on organization of the information/text.

In the present study the activity and strategy of note-taking is part of a procedure for learning. The use of the learning strategies however focus on the process of learning, whereby the learners identify, select and use appropriate strategies for performing different tasks related to subject areas.

2.14.1 Lecture comprehension and note-taking - defined

According to J.B. Carroll and Freedle (1972) - comprehension is the process of apprehending the 'meaning' of a word, of a phrase or idiom of a sentence, or of a longer discourse. T.G. Sticht (1972) says that comprehension may be regarded as a process that contains two stages:

a. apprehension of listening material, and

b. relating that information to a wider context.
Learning (comprehending) by 'listening', is different from "teaching listening" (Huey's developmental model in Carroll and Freedle, 1972) where the emphasis is on teaching meanings of words, concepts, reasoning with the information gained by listening. In comprehending lectures, explicit practice in 'thinking' about material presented orally would be useful. Comprehension here is defined as an active prediction of what will come next as well as the interpretation of the ideas encountered based on prior knowledge and experiences. Students are expected to mainly understand and grasp the overall meaning of the lecture. Understanding will therefore include prediction, translation, i.e., changing something into another form, interpretation, i.e., clarifying meaning, and extrapolation, i.e., going beyond the information given. Students will have to make use of several micro-skills in order to grasp the overall meaning of a lecture. The strategy of note-taking is in fact a part of the comprehension process. It is assumed to help process information systematically. Note-taking from lectures is writing down appropriate and relevant information that would aid comprehension and making use of the information noted down through review.

It is only when notes can serve as an aid to comprehension that the strategy could be called a mathemagenic activity. Most students do not realize the effectiveness with which
a strategy can be used in tasks related to different subjects. Students therefore ought to be given practice in tasks which require their having a broad and deep perspective of the subject.

Having thus defined the focus of the present study as the skilled strategy of note-taking, in this section, we turn to a consideration of work already done in the area of note-taking.

2.15 Review of research on note-taking and relevance of learning from lectures

There is very little work done in this area of lecture comprehension and the use of study strategies related to Indian context though some useful work has been done in this field outside the country. Some of the research projects undertaken on note-taking as a skill are given below:

There were early experiments carried out in live lecture situations which used relevant lecture materials, lecturers and tests. In the early 1920's the works of Jones and Crawford had good ecological validity. During the early 1970's more analytic experimental methods were used by Howe (1970). They all used a 'neutral' subject matter presented in an artificial way for short periods of time. In the late
1970's research appeared to be conducted in both traditions. Fisher, Harris and Hartley (1978) used relevant materials presented in a lecture format. Howe and Godfrey (1977) mostly used an experimental approach in artificial conditions but claimed to have studied realistic problems.

Hartley and Davies (1978) make a lucid review of most of the research in note-taking. Much of the research is criticized by Hartley and Davies (1978) because it has been dominated by the study of recall and in many cases with students who were aware that they were taking part in an experiment. The studies give no information at all about what students actually do with their notes after they have taken them down, a point which is significant in research which situates note-taking within a pedagogic framework. In general, most of the research on note-taking lacks situational validity as students are often instructed on how they are to take notes. Of the several experiments conducted, two were done in a natural situation and they aimed at realism. Students varied greatly in the kinds of notes they took in different situations. Generally, the empirical results obtained have not been very helpful for practitioners.

Studies on note-taking can be divided under two broad categories, namely -- experimental studies and naturalistic studies. A few naturalistic studies have been conducted by
Hartley, Fisher and Harris (1978), who used relevant materials presented in a lecture format. According to Hartley et al (1978), "notes taken in an experimental situation will not be like notes taken in a real life situation." A naturalistic approach normally involves natural situations, replications with different lectures and lecturers and students being unaware of taking part in experiments. What Howe and Godfrey (1977) conceptualize as a natural learning condition that "approximates fairly closely to those encountered in everyday situation," involves university students who know they are taking part in an experiment. In general most of the research on note-taking lacks ecological i.e., actual classroom environment validity. Students took part in experimental studies and were often instructed on how they were to take their notes. According to the naturalistic approach it is necessary to pay more attention to the details of the teaching/learning situation. One advantage of this approach is that it has an external validity, i.e., the results are relevant to normal situations. In such a situation variables like the amount of attention given to an item, the advantages of coding for oneself, the efficiency of coding operations do not matter. The results can be generalisable to other situations.
So far research in the field of note-taking has been of two types each dealing with two different aspects of the problem. One has been educational in orientation which is more practical, and the other psychological, having more to do with cognition and the processes involved in learning. The first type is concerned with methods of presentation, comparison studies of note-taking with alternative activities, of individual notes with prepared notes, the degree to which students record information presented, etc. One positive function of having notes is to help the learner stay alert. In so far as this is the case, it could be assumed that the longer the lecture, the more advantageous a note-taking condition would be.\(^3\) Fisher and Harris (in Hartley and Davies, 1978) in their studies made a distinction between encoding or the transforming function of taking one's own notes and external memory aid like teacher's notes or prepared outline notes. They suggested that the notes which a particular student has prepared provide a version of the information presented, which is more readily understandable to the individual than an alternative version.\(^4\)

The second type of research has focussed on the activities on the part of the learner that mediate between presentation of information and the way in which it is finally stored and retained. These studies were concerned with the psychological processes related to the skill of note-taking which was
considered to have important coding functions. Some of the areas under this aspect were relationships between the details of a student's notes and the precise content he/she learns, the individual nature of the note-taker and the kind of notes taken and activity of taking notes as it draws upon other procedures like coding and integrating functions and other processes that influence his/her acquisition of knowledge.

One of the recent studies on note-taking was that of Carrier et al. (1984) on the effects of facilitative and debilitative achievement anxiety on note-taking. According to Carrier et al., "if taking notes reflects encoding, storage and retrieval behaviour, anxiety should be a factor in the quality and quantity of notes."

Peck and Hannafin's (1983) study focussed on note-taking training. The instructional treatment emphasized four major components:

1. attending to specific components of presented information;
2. strategies for selecting important ideas;
3. keeping pace with the rate of the information presented; and
4. using individual strategies to personalize the meaning of the presented information.
In a study conducted by Sheffield (1974) (in Marton et al. 1984), teachers' reactions were taken on their role in the learning process. They thought that the most important role of the teacher is "to stimulate students to become active learners in their own right." A study by Marris (1964) in Marton et al. (1984), looked at students' perspective. Its aim was to examine "how the experience of higher education appears to the students who go through it." In the above mentioned studies, the focus on the effectiveness of methods and techniques has given way to a wider concern with the teacher-student relationship. But the studies examined lectures only incidentally, as part of the general pattern of undergraduate teaching. Hodgson, 1984, (in Marton et al. 1984) studied students' experiences of the relevance of their lecturers mainly through the use of a technique called stimulated recall. This technique was used to compare students' thought processes in lectures. Students' responses suggest that they could be identified as reflecting either an extrinsic or intrinsic experience of relevance.

The following are some of the aspects that the earlier research focused on and were different from the present investigation.

1. The experiments conducted earlier do not give any evidence of the usefulness of notes in acquiring information from lectures. In these situations the
activity of note-taking becomes a largely useless exercise. The encoding process probably helps in processing the information but that is not supported by the above research reports.

2. Most of the research studies have been dominated by the study of recall. This does not in any way relate to the activity of note-taking. The task of recalling can very well be done without engaging in note-taking. The very fact that students are asked to take notes proves that the notes they take are of some use to them, and that the students go back to their notes for relevant information.

3. Most of the research on note-taking lacks situational validity as the students were aware of participating in experiments. This tends to make them extra conscious in their learning process which reduces their spontaneity. Such a situation therefore does not reflect the real/natural learning context.

Secondly in the earlier experiments students were often instructed on how they were to take notes. This cannot be really dictated to the students as the skill of note-taking is a very personal or individual activity. All that they can be trained in would be related to certain mechanics of taking notes like symbols, abbreviations etc. No substantial training can be given with regard to information content. The students ought to be left to
themselves to decide on the importance of certain aspects of the information. This would match their learning style and other study skills.

4. So far research has been conducted from the perspective of the teacher/researcher rather than that of the students. The present study focuses on lectures as experienced by students.

The findings of psychological research into human learning processes has led to the belief that a range of activities and strategies used by the individual learner play an important part in determining what he/she will learn in a particular situation. It is argued that the skill of note-taking may affect what is learned, because the mental processes or activities involved are ones which also happen to promote learning. It is assumed that firstly, taking notes helps in being attentive and secondly, writing down items might involve the learner in coding or abstracting procedures that would increase the probability of information being learned or retained in memory. Taking notes does not just include the accuracy of information being recorded. The activity is likely to have outcomes contributing to learning that are additional to the obvious function of recording information. The strategy of note-taking is one of the active processes through which individuals participate in learning. In this case reference is made to the instrumental activities.
Instrumental activities refer to a student's behaviour which intervenes between instruction and criterion performance. These are directed by the learner and they mediate between instructional demands and the eventual learning outcomes. Instrumental activities are ones which are logically or empirically related in some manner to the learning task. These activities may be engaged in deliberately, with the learner's conscious perception of them as being instrumental in achieving his/her aim to learn. In the cases of note-taking, it is conceivable that a learner may take notes because they provide the instrumental function of giving him/her an external record of the information whilst without his/her knowledge the notes may also perform the additional instrumental function of encoding.

Learning which involves acquisition of subject information in a lecture situation is greatly influenced by organizing and categorizing activities on the student's part by using learning strategies which include rehearsal strategies and the use of various processing and encoding strategies. The skill of note-taking as an instrumental activity, may affect the learner's behaviour in a variety of ways which may have an effect on what is learned. The precise nature of the actual notes that are made may be influential. Di Vesta and Gray (1972) suggest that the behaviour of the student who employs encoding processes "reflects a transaction
between the learner and the material to be learned, that is, it assumes an active learner." They continue by suggesting that the learner has thus taken the initiative necessary for placing the material in a long term store; he has made the material meaningful by the encoding which has linked it to his existing cognitive structure. Encoding on the part of the learner which is involved in the production of notes has an effect upon his/her learning.\(^6\) There is sufficient amount of evidence from different sources to support the general assertion that learning is related to the extent to which individuals undertake the cognitive processes involved in coding, integrating and transforming the information which is presented to them. Therefore it can be expected that students undertake a good deal of encoding.

According to Di Vesta and Gray (1972); Dunkel (1985) and Chaudron et al (1988 , in Rost, 1990), there is not likely to be any clear correspondence between

(a) quantity of notes and quality of understanding and

(b) a correlation between quality of notes and quality of understanding. Also, experienced listeners will take notes in accordance with their expectations for the subsequent tasks.

(Dunkel, 1985; Chaudron et al. 1988; In Rost, 1990)
For example, if the listener knows that there will follow a list of questions on historical facts, the listener's attention during the lecture may be tuned to recording new historical facts. According to Di Vesta and Gray (1973), a listeners' notes may serve as a useful external store of information that he/she hopes to reconstruct when performing a task. Whether or not the listener can reconstruct useful information from these notes, is probably dependent on the degree to which particular items in the notes relate to the overall idea the listener has of the input at the end of the lecture or during subsequent review sessions, rather than at the time of writing them down (In Rost, 1990).

2.16 Conclusion

A lecture situation has the potential to generate a wide range of activities to which learning strategies can be applied. The present study begins by looking at one main strategy, used in lecture classes and goes on to identify other related strategies required for effective processing of input. Comprehending and assimilating lecture information will involve an integrated learning process that will not be possible within class hours alone. Effective use of the information would require activities outside class hours, i.e., before and after lectures.
The study begins by examining strategies related to note-taking in the classroom as note-taking is an integral part of the existing instructional situation, and goes on to the use of other strategies. The study finally seeks to identify the learning strategies that will be appropriate for acquiring information from lectures in different subjects.
NOTES

1. In the study a distinction is made between 'comprehension' and 'acquisition'. **Comprehension** is a temporary intake of information and **acquisition** of information, not language skill, takes place only when that information is adequately internalized for use. This distinction is also pointed out by Ellis (1986) with reference to language learning skill. According to him - "even if input is understood it may not be processed by the learner's internal mechanisms."

2. The strategies as presented by Brown (1982), which basically apply to language acquisition studies, have been modified for acquisition of information i.e., not language in the present study.

3. Such a view can also have an adverse effect as students might not be able to maintain a high degree of concentration for a very long period. Since being alert is 'significant' in 'successful note-taking', lack of concentration might have an adverse effect on note-taking. Studies into the assessment of note-taking might be significant in determining the appropriate length of a lecture.

4. Students' reviewing their own notes as opposed to prepared notes also has the advantage of presenting personal or individual interpretation of meaning on the information presented.
5. The encoding function of note-taking is more process-oriented, and the notion of note-taking as an external storage is more directly concerned with the end-product of the encoding functions. Since the encoding functions are strongly psycholinguistic in orientation they cannot be directly assessed, but inferences about the processes involved during the encoding process can be arrived at indirectly, through evaluation of the end product, i.e., notes.

Reviewing notes is important in that the notes might become more acceptable to the researcher and thus can easily be validated against an external criterion. But research into the assessment of note-taking is confronted with what sociolinguists have called as the "observer's-paradox" (Labov, 1969). The researchers are interested in gaining access to the notes students take when they are not being observed by a researcher. But these private notes pose serious problems because their measuring instruments are designed to assess notes and give them an external validity.

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