CHAPTER - II

REVIEW OF RELATED LITERATURE

The literature in any field is the foundation on which all further research is carried out. The Encyclopedia of Educational Research (1960) says that the related literature is the embodiment of complete information knowledge. This helps the researcher to highlight the studies and their findings related to the problem undertaken for research.

According to J.W. Best (1997), "Familiarity with the literature in any problem area helps the student to discover what is already known, what others have attempted to find out, what methods of attacks have been promising and what problems remain to be solved."

Practically all human knowledge can be found in books and libraries. So extensive use of the library and thorough investigation of related literature are essential in planning and carrying out the kind of searching involved.

In the present study very less work has been done in this area and since it is a new study much relevant studies pertaining to physics was not traced. So the researcher has collected some of the studies pertaining to B.Sc. course, Distance Education, Open Universities and one or two on Comparative Education.

Ausubel and Robinson (1969) points out that the most important factor influencing the meaningful learning of any new idea is the state of the individual's
existing cognitive structure at the time of learning through different devices we orient the learners cognitive structure.

Jamuar (1971) suggested that the way the students divide the time between academic effort and extra curricular activities is crucial.

Kaplan and Simmons (1974) proposed that objectives be placed at the end of teaching material as a checklist with page numbers for back reference.

Hasan (1975) in his study suggested that interests are innate as well as acquired dispositions. It is important for our teaching to inculcate interest at least as an acquired disposition. The development of students interest in science has long been accepted as an objective of science teaching at the school level and the term "interest in science" denotes a range of meanings from positive feelings towards science to complete absorption in scientific inquiry.

The investigator is at last to know that not much work has been done on Ph.D level about open university and distance learning. It may be because this field is new in India. The different courses are just begun, the researchers are yet to see some problems of same.

But the investigator made sincere efforts to collect some of the literature to facilitate the further work on the problem chosen for the study. So the related literature categorised as

1) Research work on Open University
2) Research work on Distance Education / Learning
3) Research work on Comparative Study between the two system of education.
Wagmer (1977) compared costs of British Open University with those of Conventional Universities and conducted that the media-based distance education was more costly initially, but ultimately achieved significant economies of scale while making a comparable contribution to national output. According to Curran, fixed costs do not change as the number of students changes. In the provision of courses, fixed costs might include, for example, the writing of course materials, the design of graphics, typesetting, and the initial production of Audio and Video tapes. Holmberg assumes both courses and students to be products - he says, fixed costs... are not influenced by the number of students or courses. Variable costs are thus incurred by course development and production, tutoring, counselling, distribution, etc. Where in principle, each into causes a particular amount of cost. Many studies have shown that choice of medium is one of the major cost-including variables in a distance education system and that the choice of certain media can rapidly and permanently increase total system costs. Rumble (1984) says that in Conventional Universities the lecture, Seminar and tutorial, dominates there is a clear and almost linear relationship between staff and students numbers, and it is this relationship that is the primary determinant of cost. Media-based distance education, however, changes the production function of higher education. This change occurs not where media is used to supplement the teachers' role this merely increases total costs, but where it is used as a substitute for teachers.

Collings, 1978, Streibel, 1989; Winn, 1990; Laurillard, 1993) In case of science teaching through distance education the issue is further complicated with students coming with strong conceptions / misconceptions about the phenomena that they have studied (Driver & Erickson, 1983; Driver et al; 1985). These conceptions may be at variance with the conceptions may be at variance with the
received wisdom of science and which undermine its learning. A common example is the notion that objects move more because they have forces imparted to them which they gradually expend, an idea which contradicts Newton's laws of motion (Howe & Tolmie, 1999). It is important to see the distance mode. In spite of the initial skepticism from the conventional peers there are several examples of definite success. The magnitude of expansion of application of distance education system to science and technology courses all over the world is reflected from the data recorded by common wealth of learning, till January 1998 in pure sciences and mathematics alone there are 3431 courses on offer through distance mode. The challenge mainly is one of ingenuity, imagination and innovative ability to avail ourself of the tools of science and technology to create the class room and laboratory environment where over one may need at home, in the office in the work place or in the field (Kulandaiswamy, 1998). Ample literature is available on how we may achieve the general aims of science courses, develop scientific attitudes, improve our techniques of scientific inquiry and inculcate a scientific temper using distance education methodologies (Everiss 1984, Cohen 1986, Narasimha Rao & Sarada, 1993, Chandra & Wong 1995; Fernando, 1995; Fox, 1995; Scanlon et al.; 1993).

Reigluth et al. (1978) expresses serious doubts about the use of questions throughout the text systematically. It also appears that locating model answers to inserted questions at the end of the text does not necessarily persuade readers to prepare their own answers first and compare them with model answers later. Though in the questionnaire, about 64% of the total students told that they use self check exercises, later in the oral interview it is found that most of them skipped reading them at the first instance or and answering them for checking with model answers. They helped the learners to get a clear idea of the subject. This may be due to the heavy loading of the subject content.
Macdonald Ross (1979), considers teaching learning interactive features of B.Sc. study materials as the cultural descendants' of tightly structured programmed learning materials. The B.Sc. learning materials of IGNOU also adopted the same approach.

Waller (1979) advanced one of the most attractive compelling and helpful way of arrangement and organisation. He argues that the only reading behaviour which authors of text books can confidentially predict is that their readers must read selectively. Such a view assumes that readers are active participants, seeking and finding information rather than passively processing information. It assumes further that, students should be able to access and sample the material through skimming, careful reading, and browsing, all of which may be achieved in anything but a linear sequential progression.

Dischasterl and white head (1980) study showed that some students objected to insertion of questions throughout the text on the grounds that such questions disrupted their study habits or routines and lines of thought. Some students are disinterested when encountered with many questions.

Lewis et al. (1980) Many of the problems experienced by distance education students are common to all, regardless of the disciplines studied - keeping up motivation to study, show interactions between student and tutor, isolation resulting in mis-interpretation of concept in the material being studied , misinterpretation of assignment requirements, limited ability to confer with other students and compare progress. For science students in general and particularly for applied science students there is the added dimension of the practical field or laboratory experiences that must be considered.
Puchostel and Whitehead (1980) also showed that referred by students during study time to the inserted questions ranged from never or hardly ever, to always. The study also revealed that some students used the inserted questions towards the end of the course as a framework for revision.

B. Holmberg (1981) While defining distance education says that distance education are those teaching methods in which, because of the Physical Separateness of learners and teachers the interactive as well as the preparatory phase of teaching is conducted through print, mechanical or electronic devices. Garrison and Shale (1987) say distance education used technology to mediate the necessary two-way communication. According to Keegan (1986), distance education uses the technical media-print audio, Video or computer to unit teacher and learner and carry the content of the course.

Wedemeyer (1981), Holmberg (1977), Moore (1973) Peters (1973) and Keegan (1986), have made attempts to synthesis the definition of distance education.

a) The quasi-permanent separation of teacher and learner through out the length of the learning process this distinguishes it from conventional face to face education.

b) The influence of an educational organisation both in planning and preparation of learning material and in the provision of student support services.

Sewart (1981) Examined the role and need for study centres in distance education. He says that existence of study centres can be attributed to an inability to develop the 'perfect' instructional package. From this perspective Sewart terms Study Centres as the 'dustbins' of distance education in which are
emptied functions which are too difficult or too expensive to perform at a distance. He points that the study Centres provides the human element which is able to adopt the instructional package to the almost infinite variety of student needs.

Marland and Store (1982) inferred, it is necessary to make informed decisions in the design of distance teaching materials and access to a brand of consumer psychology - a psychology of distance learning dealing, in ceralia, with how distance learners use, process and react to instructional material.

Marland and Store (1982) this teaching learning interactive features of B.Sc. Study materials approach is heavily teacher directed and costs the teacher in the roles of manipulator, controller and director. Some have criticised it because of the value it places on efficiency, cost-effectiveness product orientation, and marketability of the product at the expense of diversity, individuality and a humanistic approaches.

Schwittmann (1982) a German scholar studied the relation between time available for study and success at both the Funkkolleg programmes by radio in Southern Germany and the courses at the Fernuniversitat in North- Rhine west Falen. He claims that the time available for study is the only important variable for predicting success or failure in a distance study programme. He goes further and forecasts that from a multimedia study package including visits to study centres, watching television programmes, listening to radio programmes, studying courses materials, doing assignments, one can forecast which element of the multi-media study package will be dropped first when one knows the relevance of each element towards the final examination and the amount of time available to the student. There is food for thought here for those who complain that distance students do not attend study centres not watch TV broadcast with the frequency
that they should. Steward writes that “the situation of students learning at a
distance is wholly different. Often they are returning to learning after a number of
years. For such people the concept and practice of their previous learning is
some what clouded. They have an experience of life and work and hence a
framework into which their new learning has to be set. Often the students learning
at a distance are part-time their work and families are of prime importance. It is
not open to them, as it is open to the conventional students, to devote
themselves entirely and with singular purpose to learning. Moreover, the process
of learning at a distance is generically different from the conventional mode. The
swift feed back available from the face to face learning model is almost entirely
absent.”

Md Shahjahan, A comparative study of the need-pattern of university
students of India and Bangalades, Ph.D. Psy., BHU, 1982.

The study was taken to compare the need patterns of university students in
India and Bangladesh, and to find out if distinct masculinity and femininity
pattern of needs were traceable.

For this purpose a bengali Version of the Tripathi personal preference
schedule ( a modified EPPs) was developed and scale values were determined
for each of 135 statements in 15 need variables. The sample of Bangladesh
students were 100 male and 100 female employing method of successive
categories. The scale values for both Indian, Bangladesh and American samples
were highly correlated indicating their consistency across the three cultures.
Reliability coefficients for each of the sub scales were determined on the basis of
a large Bangladesh normative sample, and its validity was established against
Kundu's neurotic personality inventory. The main study samples were from universities in Hindu areas and west Bengal in India.

The results indicated

1) n-dominance and n-heterosexuality constituted the universal masculinity component and difference, affiliation, universal feminine component.

These findings were collated with the findings of an earlier cross-cultural study on India and American students.

2) Bangladesh boys had higher means on n-achievement, n-change and n-heterosexuality than Hindi speaking boys and the later had higher n-exhibition, n-interception, n-dominance, and n-aggression and Hindi speaking -female had n-autonomy. It was concluded that both male and female Bangladesh students are more orderly and systematic than their Indian counterparts. Need for change was storages on the Indian side. The Bengali speaking Indian females seemed to be less systematic and orderly even in comparison with their Hindi-speaking counterparts.


Major Objectives of this Study were

i. to identify & significant process of science indepth

ii. to develop and use a test of achievement in physics based on certain educational objectives.
iii. to determine the relationship between the scores on tests of science process and the variables of SES, intelligence and achievement in physics in the context of residence and age levels of the pupils.

The study was conducted on 944 boys and 403 girls from 20 schools. Tests used for the collection of data were Jalotas. General Ability Test, a Battery of Tests of Science processes Observing, hypothesis, achievement test in physics adopted from SES & scale. Statistical techniques hypothesis testing were analysis of variance t-test, product-moment coefficient of correlation and factor analysis.

The findings and conclusions of the study were as follows,

1) The scores on science processes were found to be correlated with intelligence and also with the components of SES.

2) A moderate relationship of achievement in physics was observed with three processes of science namely; Observing measuring and drawing inferences and a low level of correlation was observed with the remaining processes.

3) Boys were found to be superior to girls on the process of observing, measuring and drawing inferences.

4) With growth in age, a decline in ability to perform on science process was observed.

5) Urban students out performed their counterparts in rural areas on science process.
6) The five factor structures which were extracted were named hypothesis-making ability, SES factor, maturity factor abstract reasoning and the factor of convergent thinking.

Woodley & Parlett (1983), Roberts, (1984), OLA, (1991); Belawat (1995) observed low persistence rates in different open Universities can be partly attributed to lack of systematic efforts in preparing the learners to be well versed with the open learning system than the class room teaching (through print text books). In this context the paper discusses the various strategies open universities adopt in preparing their learners and the issues involved in making these effort effective taking the example of IGNOU.

Kassam and Healey (1984) have noted that one reason for the greater demand for more non-formal education, is failing of the formal systems of education. These failings include rigidity, elitism, pre-occupied with bookish knowledge rather than problem orientation and functionality, and an inability to prepare young people adequately for life and work.

Arce and Romiszowsky (1985) in their project gave the outline of instructional design. In their design they have given the steps as:

1) The structure of laboratory activities or units carried out under instructor supervision in a specially equipped digital laboratory.

2) The structure of instructional materials composed of a network / schema / entailment mesh of key facts and concepts of subject matter.

Sahoo (1985) is of the view that large number of learners having 10 years gap between their last qualifying examination and enrolment in the present courses.
According to Holmberg (1986) Distance Education comprises one way traffic by means of printed broadcast and for recorded presentations of learning matter and two way traffic between students and their support organisation. Ljosa while defining distance education said "distance education must involve a significant amount of real, non-contiguous, two way communication between the teacher and student(s) for the purpose of facilitating and supporting the educational process.

Aram S.A., A Comparative Study of Mathematics Education in peoples Democratic Republic for yeman (PDRY) and India, Ph.d Edu., Del U., 1986.

Objectives - This is a study made to describe present status of major areas of mathematics at secondary level in the PDRU and India to make practical suggestions, identify methods of teaching, find attitudes of Mathematics teachers towards text books and examine procedures of evaluation of students achievement.

The study followed Survey method of research. The sample includes PDRU and India. 50 student teachers from PDRU & 50 student teachers from Delhi University was selected randomly. The tools were questionnaire for teachers and an observation sheet.

Findings were

1) Objectives of India were connected with National goal whereas PDRU there had been no mention of any explicit statement concerning these aspects.

2) Objectives played important role in both the Countries.
3) In India objectives were stated clearly but in PDRU it was not elaborated.

4) In India, the stress in teaching Mathematics was on the development of thinking and abilities of students whereas, in PDRU the emphasis was on the application of mathematics and the development of induction and deductive thinking.

5) Mathematics occupied an important position in the school curriculum in both the Countries.

6) In India mathematics curriculum was designed in PDRU there was no particular document that dealt with the mathematics curriculum at secondary stage.

7) Indian curriculum took three aspects viz., learner teacher and mathematics. Whereas in PDRU the curriculum was not connected with these three aspects.

8) Curriculum in two countries differed in some aspects.

9) Text books in both countries has similar aspects like topics, same techniques of teaching. Indian teachers used more techniques than PDRU.

Lewis (1986) says that open learning is when decisions about learning are taken by the learner or learners themselves. These decisions may be over a number of different aspects of the learning process, including whether or not to learn? what to learn? who to turn for help? how to get learning assessed? what to do next? Open learning covers a wide range of innovations and reforms in the educational sectors. Included are changes that aim to improve such things as the participation of learners, instructional design, methods of transmitting information and support to learners."
Rebello, D.M., Narayan, L. and Sujatha, P.,

Comparative Study of Formal schooling and Personal Efficiency in India and USA, ASI, 1986 (Spencer Foundation financed).

The Objectives of the study was to compare formal schooling programmes with respect to personal efficiency in India and the USA.

The study was longitudinal as well as cross sectional. There were three types of samples 200 were out of school youth sample 120 were special sample person & 110 were retest sample.

The purposive sampling technique was used.

The findings of the study were,

1) In USA and India studies there was a positive correlation between additional years of schooling and personal efficiency.

2) In Indian set up, the dropouts were more.

3) In later life, persons with education had higher levels of efficiency than those who dropped out of school.

4) With a drop-out sample also, work experience has a stronger relationship with personal efficiency than education.

5) The study has its results on the whole modified repetition of results of USA study and the earlier Indian study (1977-78).

The study has its implications for the present Indian educational system which should prepare children to face the future with courage, self confidence and
competence. The examination-oriented system with irrelevant curriculum has to be changed.

Agnihotri, S.K., 1987 Study of Influence of some of methods of teaching physics on the achievement in physics of class X students in Delhi, Ph.D Education Delhi U.,

The objectives of the study was to test the following hypothesis

1) There is no significant difference between the mean achievement in physics of different groups of students taught by different methods, viz lecture cum-demonstration method, laboratory method, programmed instruction and assignment - cum discussion method.

2) The interaction between teaching methods and different schools is not significant.

3) The interaction between teaching methods and different levels of students is not significant.

The investigation followed the pretest/post-test experimented experimental method of research where two units of physics were taught according to the design by different methods, viz., the method designed by the investigator, the traditional method, or the lecture -demonstration method, programmed instruction and assignment cum discussion method. For the experiment ten schools were selected from Delhi in which physics was taught. A sample of 520 grade X students was selected. They were divided into four groups of 130 each. The achievement of students in physics in each of four groups in each of the schools was similar prior to the experiment teaching.
The tools used were achievement test programmed learning material and instructional material for different teaching methods.

The findings of the study were

1) The traditional method or the lecture cum demonstration method followed by the verification type of laboratory work was more effective than the assignment cum discussion method but this method was less effective than the programmed instruction method for the teaching of physics.

2) With respect to achievement in physics, programmed instruction for the teaching of physics was less effective than the method of teaching of physics systematically designed by the investigator, but this method was found to be more effective than the assignment cum-discussing method and the traditional method or the lecture demonstration method followed by the verification type of laboratory work.

3) The method of teaching physics systematically designed by the investigator was found to be more effective out of four methods with respect to achievement in physics and the assignment cum-discussion method was found to be the least effective with respect to achievement in physics.

4) Relative effectiveness of all the four methods with respect to achievement in Physics was the same for all the levels of schools and students.

5) If all the four methods selected for this investigation were ranked with respect to achievement in physics, it was found that the method of teaching physics systematically designed by the investigator was the first the programmed instruction modified by the investigator for the teaching of physics
was the second, the traditional method followed by the verification type of laboratory work was the third and the assignment-cum-discussion method was the fourth.

David Harris (1987) studied that the grading of students is possibly, the most significant social or political aspects of higher education. As such it occupies an important place in distance education. The function of assessment very clearly expressed in students hand book(UKOU).

"......[Students] success will be measured [but] there is no need for an open university students to get observed by grades. The open university system is not based on a rat-race conception of grading. The award of a course credit does not depend on a competition; We do not say, 'are with pass X percent and fail the rest.' The continuous assessment scheme has two main function besides assessing your progress to help you learn and to provide feed back about the effectiveness of the learning materials. We can identify any areas within the course that are not teaching effectively, and the course team can take remedial action."

Bates Toney (1989) prepared an instructional volume for distance learning in the open learning institute. He, in his volume designed and enumerated various steps of preparing the volume which can be helpful for the home study.

Holmberg (1989) in his book theory and practice of Distance Education that distance education (DE) functions under much more difficult circumstances in the poor countries than in the developed ones, but it functions well. While talking about evaluation of Distance Education he said that the basis and methods of evaluation must be grasped first, when one thinks of evaluation of distance
education. Comparison of objectives and performance standards of achievement, consulting experts future employees / teaching bodies, and investigation students attitudes would be the bases. Developmental testing, evaluation as illumination, quantitative analysis for formative and summative evaluation would be the methods. Completion and drop-out rates, and economics of distance education also become part of evaluation. Conners(1981) believes that the biggest problem in distance education is the fixing of criteria for the assessment of students in distance education. Because in the absence of only sound criteria it will not be possible to get the best result in distance education.

Frank (1990) prepared the independent study guide for various courses in UBC and the distance learners found this very useful.

Franks UBC (1990) designed the course for independent learners. He prepared guided independent study modules in which he enumerated the steps involved in preparation of guide book for distance learners. The steps are as.

i) Instructional design,

ii) Behavioural objectives

iii) Course content

iv) Course material

v) Course variables and

vi) Experience for distance learners
Hegarty - Hazel (1990) points out that regardless of issues of safety, professionalism and equity of learning experiences for on and off-campus students, there is still the issue of the laboratory experience as being crucial to the understanding of science, to be dealt with. In a very important sense, the laboratory in professional science is where much of the structure of scientific knowledge is made, modified or radically charged. He further argues that the laboratory must be an integral part of the science curriculum, raising key curriculum questions for anyone teaching a science programme. The teaching laboratory has been a key component in the development of science.

Layton (1990) Observation is also a crucial component of laboratory work. Students have to learn accurate observation techniques, uncoloured by the bias of previous beliefs. They need to realise that the new information is usually interpreted in the content of an individual's cultural background and past experiences. They will then be less likely to argue that their observations are wrong when there is a conflict between predicted and observed events. Instructors have an important role in facilitating this process at the time when the observations are being discussed and interpreted. So, although there is always a need to reappraise the functions of student laboratory activities, science education without such laboratory experience remains unthinkable.

Tang (1990) prepared the course materials for distance learners in which he gave various steps which are to be covered in the instructional design.

In the University of Alberta, he emphasised the instructional design course system analysis, attributes and cognitive processes that interact with instructional design variables, especially in distance education settings.
Saleh, (1991) With the implementation of the comprehensive distance learning package in 1983 / 84 academic session, the passing rate in individual courses and the gradation rate improved tremendously where about 60 % science students reached the final year within the minimum period with less number of dropouts who postponed their students for one or two years. The quality of graduates is on part with if not better than their counterparts in the conventional system and in addition CDE graduates are experienced workers.

Gang et.al., (1992) revealed that in our efforts for maintaining partly with conventional B.Sc. programmes and at the same time introducing innovations in the curriculum design, the student work load increased by as much as one and a half times, even by conservative estimates. This is to be looked into at the time of next revision.

Lockwood,(1992) points out that most of the students who are continuing their studies are employed. In the oral interviews some of them told the course is useful in their job. They have self focused benefit and ready to spend the cost on their time. About 80% students who responded to questionnaire said that they have to spend more time and effort though their counterparts in the conventional classroom system. This may be either due to the high standards they have to achieve or due to the less support they receive. The feeling of spending more time may be much more in case of students whose benefit is obtaining a certificate only.

Lockwood (1992) Observed that anything that was not directly relevant to answering the assessment questions was ignored and the students geared their entirely study to answering TMA (tutor marked Assignment ) most of the students found assignments as very useful in their studied next only to print.
Lockwood (1992) indicates that learners typically operate within a cost-benefit analysis model. He argues that basically learners constantly balance the perceived benefits that activities offer with the costs they will incur in responding to them.

Lockwood (1992) points out the cost-benefit analysis. If the learner is aiming at getting a degree / diploma certificate for being suitable for the job market, telling him/her on how to master a particular subject may not be useful. A person who is employed may be interested to develop certain practical skills and telling him/her how he can develop those skills easily may motivate him more.

According to Kemp (1993), the typographical factors that influence the learners use of instructional texts can be classified as micro and macro layouts. The micro typographical parameters essentially are those which govern the legibility and readability of the type, whereas the macro-typographical features are those which govern the spatial arrangement of page elements to ensure the structure cohesion of a document.

Scanlon et al (1993) Like any discipline, science has its own language to be mastered and used which in communication, equations notations, diagrams, figures, technical terms and even the language of common communication. These, along with the logical structure of science contents make the design and development of science multimedia packages difficult, and also make it difficult for students to understand such materials. In this context note that

"......... Teaching students of widely varying background makes the assumption of a shared context difficult, and just grasping the meaning of a text can depend on creation of this shared context problem exist path at the level of
individual words, and extended pieces of argument, even the names of things can cause a problem that can be accentuated by students studying in isolation..."

Derek Rowntree (1994) recalled the special features of open learning materials in the instructional system and design of B.Sc. programme.

♦ Clearly stated objectives

♦ Advice about how to study the material

♦ Use - friendly, 'You-and I' Stylo of Writing

♦ Shortish, manageable chunks of learning

♦ Fewer words than usual per page (or screen)

♦ Plenty of helpful examples.

♦ Illustrations used where they are better than words

♦ Headings to help learners final their way around.

♦ Links to other media where appropriate

♦ Obvious awareness of different learner's needs

♦ Exercises that get the learners to use the material

♦ Space for learners to write down their own ideas

♦ Feedback to help learners check their own progress

♦ Suggestions about getting help from other people.
Evans (1994) points out it is deceptively easy to develop courses on the basis of taken for granted assumptions about students' circumstances, such as their access to libraries or study centres, spare time to study, reading and writing abilities, interests in the subject, physical abilities etc. He adds that courses which are planned on the assumption that all students will have sufficient 'quality time' and access to libraries and study centres, are designed to fail, or rather they are designed to fail some of the students. This is where we need to fill the gap by preparing the students through various strategies.

Harden et al (1994) have analysed and pointed out, teaching (including Science teaching) at a distance is as effective as teaching on campus, even in dual mode institutions.

Sewart (1994) points out there is a tendency on the part of open universities to focus more on production sub system and less on support sub system. As a result excellent study material with high standard are produced and other support material are given. The learner is also offered support through face-to-face sessions, interactive radio counselling.

Audio / Video lessons, teleconferencing etc. But how effectively the learners are able to utilize these service and what factors effect use of fixed inputs of different media is often neglected.

Sinchair and Basu,(1995) in a recent feed back study done on two mathematics video programmes an attempt was made to assess as to how much the facilities provided at the study centre were being used by students as also the benefits drawn by them from these programmes. This study revealed that A/V facilities at study centres were quite underutilised. The university needs to devise
ways and means of utilising these facilities optimally. Even the video programmes
telecast on the national television network has only about 50% viewership. Since
the investment (both material and intellectual) in producing science audio and
video programmes is tremendous, it would be desirable to set up a research unit
for systematic evaluation one comprehensive feedback on the utility of A/V
programmes. The outcomes of the unit's research studies should be
communicated back to the concerned units for suitable action.

Seward (1996) pointed out the high emphasis on the grandiose of study
material may only lead to instruction and even to indoctrination. He points out that
the high standards set in the points out that the high standards set in the
instructional material may lead to dense content inhibiting the active involvement
by the students. Asubel proposes a meaningful learning theory that includes
non-arbitrary, substantive, non-verbatim incorporation of new knowledge into
cognitive structure, assumption, programmes differentiation and interactive
reconciliation of concepts.

Vijayashree et al. (1997) had taken only those students who appeared for the
exam and completed. The success rate for the theory elective course in B.Sc. All
India data was taken from the students registration and evaluation division. In
PHE-01 out of 1074, only 607 have cleared the course. In PHE-02, Out of 956
only 419 have passed. In PHE-04 out of 198 only 140 have cleared the course. In
PHE-05 out of 170 only 128 have cleared. In PHE-06 out of 228 Only 82 have
passed. In PHE-07 out of 249 only 125 have cleared. In PHE-09 out of 70 only 56
have cleared and in PHE-11 out of 56 only 35 have cleared the course. Since the
registration is valid for 8 years we can not say that those who have not cleared
the subject are dropouts. But it appears many of them may not return to the course.
In can be argued that if we can prepare the learners taking into account all factors we can improve the student learning capacity and thus the success rate.

Kuman (1998) in his study concluded that there existed a significant relationship (Corelation) between academic performance and study habits.

Lockwood (1998) suggests a mode placing aim at the start and objectives at the end. By placing the aim at the beginning of the teaching material, he argues that the overall direction is clear and the learner is not intimated by the details. By placing the objectives at the end of module they become a checklist. The disadvantages of this model are learners may be unaware of their ability or inability to perform the as yet unseen objectives are ignored the effectiveness of model is contextual and may also depend on the characteristics of the target group.

Lockwood (1998) points out the distinction between textbooks as used in conventional classroom in comparison with the self-instructional materials of distance education.

Murphy and Yum (1998) examining on how individuals organised their study time were surprised to find a great amount of variation in the overall pattern and in the number of study hours per week. This is an important observation, as it tends to suggest some study pattern and time management. Unlike in conventional university, the open university bearer is given a greater flexibility of time to complete a given course. This, though necessary, has a disadvantage. The learner can neglect his/her studies due to other commitments.

Murphy & Yum (1998) studied that distance learning student is likely to spend much more time with their work colleagues and families than with their friends or
classmates. There are few opportunities for students to meet one another. Mostly the contacts will be study related and rarely they meet for social reasons. This clearly affects the level of friendships that the students can establish with their academic peers and thus the opportunity and ability for them to work together this will be clear from the comments of Hong Kong learners.

"We talk in class we rarely have other contacts, not even by phone."

"I am still very detached from my fellow students. Upto now, I haven't met one whom I know well."

"I think it's difficult (to establish contacts) as we have our work and family."

The experience in IGNOU is also not much different. Most of the students do not find it possible to meet other students. The attendance in face to face counselling is also low. In the oral interviews most of the B.Sc. students expressed the difficulty of finding time for socializing with other students.

Time management in exam, remembering the points, understanding concepts were mentioned as major study problems by many students while they were in college/school. These problems are relatively easy to tackle by students in the on-campus study. But this problems may multiply in open university system, as the students do not meet their peers or instructor often. This is an important factor to be considered as all the strategies adopted are aimed at preparing the learner at the beginning of the academic session and not in between. Though assignment in a way serve thus purpose to some extent, this may not be sufficient considering the fact that students may focus more on how to score good marks in assignments. It is necessary to adopt strategies in preparing the open university learner in between the academic year also.
Narasimha rao et al (1999) Inspite of the various efforts it is observed in a study with B.Sc. students that the learners fail to utilise the services provided at regional and study center, s’ and continuation rates and pass percentage are very low. The re-registration data of certain programmes (Bangalore regional Center) where the student has to register or next semester / year shows that on an average only 40-50 % students move to 2nd year and only 20-30 % move to 3rd year.

The number of students successfully completing the different courses was seen (till December 1998) provided by students registration and evaluation division. The data specific to karnataka & Goa region was taken. For example, in PHE-01 out of 514 only 11 have cleared the course. In CHE 01 out go the 469 students only 34 got through. In LSE - 01 out of 457 only 38 have so far cleared the course. The results appear to be very poor compared to all India level.

However Vijayashree et al had taken only those students who appeared for the exam and completed.

Narasimharao etal. (1999) In the study with B.Sc. students it is observed that many students got scored after receiving the first lot of study material. This is the case with those who continued their studies. When freshly admitted students were asked about their expectations from induction programme some of them asked for information already, provided through invitation letters (first letter), prospectus and programmes guide.

Narasimharao etal (1999) observed that the B.Sc. students were not able to use these learning material and study devices optimally. In the interviews with these students, it was observed that though they are very much interested to
excel in their studies and make use of IGNOU materials, they are pressed for study time

Forced to compromise in their studies because of work job related commitments.

Forced to adopt survival strategies or less satisfactory approaches.

The low success rate of B.Sc. learners also indicates that there should be more input. This may be even region specific. It is necessary that OU learners are prepared well taking into consideration the material supplied. In this context understanding student experiences during mid courses would be helpful. The challenge is to develop and maintain approaches which enable students to have their voices heard and for the open and distance educators and their institutions to be able to listen and understand the practical implications of what is being said. For this the student support service sub system should be more proactive. It is necessary to provide help for raising the level of students thinking.

G.Ram Reddy while commenting on the functioning of Andhra Pradesh open university observed that biggest problem in case of open universities in the selection of editors and course writers. While majority of teachers may be good in oral communication skills, it is really a new assignment even for an experienced teacher to develop a course material suited to the distance learners. In multilingual situation like ours, the question of language too becomes crucial in the production of good quality teaching materials.

Keegan Stress that "In traditional education a teacher teaches. In distance education an institution teacher- This is a radical difference. In traditional education system the teacher is present in the lecture room and his success often
depends on the rapport he can build up with the students' personalities and even idiosyncrasies may be central. In distance education the teacher prepares learning materials from which he himself may never touch. Another, teacher may use the materials and evaluate the students' work. The students becomes institutionalised. He further says that "In distance education the influence of an educational organisation both in the planning and preparation of learning materials and also in the provision of student support services distinguishes it from private study and teach yourself programmes".

CONCLUSION

The investigator does not claim that the related literature reviewed above is complete. Attempts have been made to include all the aspects of B.Sc. physics course of IGNOU and twelve science colleges of six conventional universities in Karnataka. In this review chapter much research work has not been done so far in this area. The review reveals that IGNOU will effective if and only if adequate infrastructure, methodology, teaching-learning process, library facilities and proper inputs are there. Whereas, conventional universities has a very good set up. So the investigator feels that this is a very fertile area to conduct research and the present study on comparison of B.Sc. physics course of IGNOU to that conventional six universities of Karnataka is a very significant one.