

CHAPTER II
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2.1.0 INTRODUCTION

Review of related literature is one of the significant aspects of research. It enables the researcher to know the amount of work done in the concerned area and to have knowledge in unknown and unexplored areas. It is necessary that the researcher be aware of the knowledge generated and the ongoing process of knowledge generation for a better clarity of the problem and an insight into its methodological issues. For any researcher, review forms the basis for the problem under investigation and helps him/her to arrive at the proper perspective of the study.

In this chapter, review of related literature is presented in three sections. In the first section, the review of related researches in the area of teaching learning of Social Science particularly in secondary and higher secondary education is done, in the second section the review of related researches is done in the area of Open Book Examination including Open Book Environment and in the third section the review of related research is done in the area of the development of thinking. Research conducted between 1960 and 2016 are presented in this chapter. Research studies have been presented here with their objectives, methodology and major findings in a chronological order.

2.1.1 STUDY CONDUCTED IN TEACHING LEARNING OF SOCIAL SCIENCES

Narayanswami (1960) did an enquiry into the teaching of social studies in the school of Madurai and allied problems. Study was aimed at the inquiry into the social studies as an interdisciplinary subject instead of separate discipline like Geography, History, and Civics etc. Major findings of the study stated that the fund allotted for the Social Studies equipment was very low and the activities which are mentioned in the syllabus for learning social studies in play way methods are hardly followed.

Lulla, Shah and Darji (1966) studied the academic causes of backwardness in social studies at the elementary stage (I-VII). The objectives of the studies were (i) to

investigate the facts responsible for low achievement, (ii) to study the prevailing position of social studies in Gujarat and to collect suggestion and (iii) to improve the teaching of social studies in the elementary schools of Gujarat. The following were found to be the academic causes of backwardness in social studies, a) They pertained to defect in curriculum, teaching learning materials (TLM), b) teachers and teaching methods, administrations in schools and examinations, c) Syllabus of subject was too heavy, divorced from real life situations and sometimes even beyond the grasp of a teachers, d) Information in textbook were outdated, lack of teaching aids and classes were overcrowded, e) Teachers were overburdened with non academic work and f) Other reason for the low achievement in the social studies was lack of motivation and negative attitude of students and community towards the subject.

Chakroborty (1978) did an enquiry into the strategies of classroom teaching in social studies. The broad objectives of the study were to find out the effectiveness of strategy- 1 (lecturing and questioning answering), strategy-2 (lecturing and questioning answers by using behavioral objectives) and Strategy-3 (discussion by using instructional materials) on the development of knowledge comprehension, application ability and total achievement in geography of pupils of standard IX and second objective was to find out the effectiveness of above stated strategies. The strategy-2 was found to be more effective than strategy-1 and strategy-3 was most effective of all. Lecturing and question answering with behavioral objectives and discussion by using instructional materials were more effective than lecturing and question answering positively and conclusively.

Gupta (1983) conducted a critical study of the social studies curriculum with special reference to secondary stage in Himachal Pradesh. The objective of the study was to analyze the needs, aims and objectives, contents of the curriculum, methods, techniques, teaching materials used and strategies of evaluation employed in social studies at school level. The study was mainly of status survey type. It adopted the descriptive survey method of research. The principal tools for data collection were two questionnaires. The major findings of the survey stated that the syllabus was not appropriately integrated with respect to human relationship, social adjustment and there was no scope of self analysis in curriculum of social studies. No significant problems of present scenario were merged in curriculum. Lecture method was

frequently used and no creative method was used like project method, activities method etc. Students were not exposed to various learning experiences like assignment, observation, discussion and interpretation. At last the social studies teachers did not build a wholesome community environment.

Jani (1983) studied the status of teaching geography at secondary level in Gujarat. The objectives were to study the prevailing position of the teaching of geography in the rural and urban areas of Gujarat, to study the qualifications and experience of the teachers teaching geography, to study the textbooks of geography prescribed for different standards in Gujarat in the light of the curriculum of geography, to study the availability of teaching aids and other facilities like library and their use in the teaching of geography. The method of study followed was that of survey. The data were collected using questionnaires. The findings stated that 50 percentage of the teachers were not qualified in the subject of geography, about 52 percentage of the teachers teaching geography did not have geography as a method at their B.Ed. level training, 77 percentage teachers taught through lecture method, teaching aids and facilities in 52 schools, especially for geography was not satisfactory.

Bhattacharya (1984) completed an experiment on the effectiveness of various models for teaching geography subjects in relation to instructional resources. The main objectives were as follow; a) to find out the effectiveness of teaching geography subject through the concept attainment model in relation to instructional resource, b) to find out the effectiveness of teaching geography subject through the inductive model of teaching in relation to instructional resource, c) to compare the effectiveness of teaching geography through the concept attainment and inductive models of teaching in relation to instructional resources, d) to find out the interaction effects of the different levels of educational institution resources status, model of teaching types of concepts taught on the gain in achievement scores of junior high school students in geography. The research was conducted with equivalent group design with three treatments, like teaching with traditional methods, concept attainment model and the inductive model. Data collection was completed with the help of educational institution resources status index, socio economic status index, entering behavior test in geography subject prepared and standardized by the investigator. Others tools used for the data collection were Joshi's General Mental ability test and Joshi's study

habits and Attitude Inventory. Mean, t-test and three way analysis of variance in a 2x2x2 factorial design were used for analyzing data and drawing conclusion. The major findings of the study were as follow. a) The Concept Attainment Model group of students did not differ significantly in Achievement from the traditional teaching technique group in high resource status educational institutions, b) students taught through the Concept Attainment Model showed better test achievement in Geography than the traditional teaching technique group in average and low resource status of the educational institutions, c) Inductive Thinking Teaching Model group proved itself to be more effective for achievement in Geography in Comparison to the traditional teaching techniques as well as the Concept Attainment Model, irrespective of the resource status of the educational institutions, d) The main interaction effect of high and low levels of the educational institution resource status, Inductive and Concept attainment Models of teaching, and the test achievement in physical and human geographical concepts were found significant beyond .011, e) 0.1 levels of confidence respectively, f) other combined interaction effect was not found significant, g) the test achievement of standard VIII students belonging to high resources status of the educational institutions was found significantly better in geography subject in comparison to their counterparts in low resource status of the institutions in the Concept Attainment as well as in the Inductive Model Groups, h) the students showed better Achievement score in the Physical Geographical concepts in comparison to the human geographical concepts irrespective of the high or low resource status of the educational institutions, i) the models of teaching approach produced better achievement in geography subject even in low resource status educational institutions.

Ingole (1985) did a critical study of the present position of teaching history in secondary schools of Sholapur district. The main objectives were to find out the existing position of teachers perception for teaching history, to study the position of teaching history in secondary schools with reference to curriculum, textbook, methods, facilities etc, to find out ways and means and measures to improve the teaching of history. The study was of survey type. The data was collected using a questionnaire for history teachers, structured interview schedules for headmasters, educational officers and experts, observation schedules. The major findings were that the teachers were qualified but 40 percent had not offered history as a subject at graduate level, according to the objectives of teaching history could not achieved

through regular teaching due to inadequacies of curriculum, textbooks and time, narration was the most popular method for teaching and teaching aids were rarely used.

Raina (1990) conducted a critical survey of teaching history in Rajasthan. Study aimed at making a critical survey of history teaching at a micro level by choosing existing state of affairs in the state of Rajasthan. The study revealed that the academic and professional background of the teachers was poor, the teaching and the set objectives was not in tune, 86 percent teachers used only lecture method, non availability of instructional material, aids and suggestions for improvement were provided.

Sharma (1992) conducted a sociological study of language and social sciences textbooks produced by National Council for Educational Research and Training [NCERT]. The study aimed to identify significant social concern that need to be reflected in textbook in language and social science, to develop comprehensive criteria for evaluation of the books, to evolve a clear pictures of the societal concern in the textbooks of language and social sciences produced by NCERT and to suggest policy implementations regarding textbooks prepared by the NCERT. Major findings were that social concern of the democracy and the secularism were reflected in the textbooks of the old subjects except geography and there is a need to improve the social concern in the textbooks.

Kathy (2000) conducted a study on Building Geography Skills and Community Understanding through Constructivist Approach. The targeted population was a second grade class in a rural Midwestern setting. The need for strengthening these skills was documented by observation, checklist, survey and pre and post-tests. An analysis of the probable cause for lack of Geography skills revealed that students do not have good definitions of geography and community or why they are important. Many thought they linked maps, but did not have a grasp of their purpose. The literature reviewed indicated that young children are not cognitively able to grasp some concepts set forth in geography. Constructivist learning methods, cooperative groups and multiple intelligence were the main focus of the investigations chosen to help the studies in the second grade class. Post intervention data upheld the premise that strategies would serve to raise the students' skills and understanding in the area of

geography and community. Following the intervention, they not only linked maps, but they also understood and used them well with the knowledge that all people in community situations share the common need to understand and be informed about their world.

Ibrahim (2007) conducted a study on the student's readiness for technology enhanced history education in Turkish high school. This study examined whether the Turkish high school's social sciences major students would feel adequate and fit in a technology enhanced environment, particularly in history classrooms. Therefore, they appear to be ready for technology enhanced training. But study also revealed that the use of technology in social sciences courses is very low, it needs extensive reforms in curriculum and instructional method.

Jennifer (2007) studied the effectiveness of a mixed methods study of the teaching of social studies concept in elementary classroom. The aim of the study was to know the status of social studies. A list of key social studies concepts of grades 1-5 from the Oklahoma pass document and the Californian concept collection was used to survey approximately 100 elementary school teachers. Analysis revealed that elementary teachers are teaching most social studies concepts in traditional time blocks and with curriculum integration in a variety of methods.

Jameela (2010) made a comparative study about the behaviorist and constructivist approaches in teaching and learning of economics in higher secondary schools in India. In order to study the investigator selected one chapter 'liberalization' from the syllabus of CBSE, one class and 70 students from higher secondary schools of Kerala as sample. The sample was classified into two groups. The control group was taught by traditional behaviorist approach and the experimental group was taught by constructive approach. Classroom Assessment Technique and performance test were the tools used for the study. The study brought out that performance and knowledge enclosed by learners taught through constructivist approach are much ahead in overall teaching and learning activities than student taught by behaviourist approach.

Singh (2013) conducted a study on the development and implementation of Multimedia package to teach Geography at standard IX CBSE students. The main objectives of the study were: a) to develop the multimedia package in subject of

Geography for standard IX CBSE students; b) to implement the developed multimedia package for teaching geography to standard IX CBSE students; c) to study the effectiveness of multimedia package in the terms of achievements of the students; d) to study the effectiveness of multimedia package in terms of reaction of students towards the developed multimedia package. The major findings of the study were a) the developed multimedia package was found to be significantly effective in terms of enhancing students' achievement in Geography in comparison to the traditional approach; b) the developed multimedia package to teach Geography was also found to be effective in terms of the reaction of students towards the package.

2.1.2 STUDIES CONDUCTED IN OPEN BOOK EXAMINATION

The researchers came across the following studies on the Open Book Examination which is presented as follow.

Krarup et al. (1974) completed an experiment on open book tests in a university course. Students of the experimental group view text books during test, and the control group appeared closed book tests without viewing textbooks during a regular course in physiology at a medical school with the help of two parallel 60-items multiple choice tests. The study consists of 120 medical school students for the sample and the ANOVA was used for data analysis. The findings stated that the difference between the two tests was significant with respect to the effect of books specially on objective question, the majority of students in each group think that books influence positively in their recall item performance, while a smaller number think that they benefited from the use of books on problem- solving items. The majority of the students told that the test in which they had access to books were the more difficult for writing the answer of the question.

Pauker (1974) completed an experiment on the students' performance in an open book test in comparison to traditional close book test in an undergraduate Child Psychology course. Students of the experimental group view text books during test, and the control group appeared closed book tests without viewing textbooks during the examination in child psychology course. The findings stated that there were no significant differences in average student test scores when compare between the

experimental group view text books during test, and the control group appeared closed book tests without viewing textbooks.

Francis (1982) investigated the effect of open book tests in a university English literature course. The test was conducted with the two groups in English literature. Students of the experimental group view text books during test, and the control group appeared closed book tests without viewing textbooks during the examination in English literature. The findings of the study stated that the students of experimental group get higher test scores than their peers who were examined through a traditional examination.

Richard (1985) completed an experiment on the evaluation of the open book examination. Traditional closed book examinations were administered to a class of University of Hawaii students; the same examinations were administered to another section of students taking the same course with the same mentor, differing only in that the second was open book examination. A replication is also reported. Three hypotheses were tested at 0.05 level of significance. These were the following hypothesis. a) The open book examination will lead to fewer student errors; b) The open book examination measures different abilities than the closed book examination; c) Student ratings of the help received from open book examination will not be related to examination scores. The first hypothesis was not substantiated, but the second and third hypotheses were established and it showed that the OBE was able to measure different abilities than the traditional close book examination.

Feller (1994) mention in his article “Education for the Future” to believe that to change education from educating our students to live in the past to the future, the open book examination must be implemented. The closed book examination only exhibit what students can do with whatever they have been capable to memorize. The open book examination measuring high cognitive level skills such as conceptualizing, problem solving and reasoning corresponds almost completely in real-world situation. In the closed book examination students only demonstrate what they have been capable to memorize.

Theophilides and Dionysiou (1996) did an enquiry on the Major Functions of the Open Book Examination at the University Level: A Factor analytic study. The

objectives of the study were: i) to identify the major functions of the open-book examination as perceived by university students ii) to verify whether the functions identified are perceived differently by different groups of students and examination stress. The sample of the study consisted of all sophomore students (N=173) in a teacher-education program of the 1997 class who registered in an introductory course on the foundations of education. All the members of the population were included in the sample. The study was of an ex-post facto research design. The data were analyzed using a principal components analysis and a t-test for two independent samples. A questionnaire was prepared by the investigator. Major findings of the study were as follows. i) The five factors identified were Creative Use of the Knowledge Gained, Course Content Mastery, Student Self-evaluation and Feedback, Reduction of the Examination Stress and Student Self-regulation in Course Studying. It became clear that students' anxiety level about examinations in general and expected graduation grade did not influence in any significant way students' perception of the extent to which the above five factors were present. ii) The open-book examination offers students a self-evaluation mechanism. This self-evaluation takes place at two different stages. Firstly, during the study period and preparation for the examination students assess their learning gaps in course-content mastery and they act accordingly in order to complete their knowledge. Secondly, at the end of the examination students are in a position to perform self-evaluation and judge the outcomes of their examination preparation. iii) The study suggests that, although not removed completely, the examination tension and stress which accompany any examination are substantially minimized. The students work out their answers in a more relaxed way and they feel more confident about their performance on the examination. iv) Finally, the open-book examination allows students to self-monitor their preparation for the examination and take appropriate action. Students plan their studying of the course content. v) The outcomes of the study, however, should not lead to the conclusion that the open-book examination comprises the solution to the various testing problems or even that the process itself is unproblematic. However, these problems associated with the open-book examination do not diminish its merits as they were identified by the study.

Ioannidou (1997) completed a study entitled "Testing and Life-long Learning: Open Book and Closed-Book Examination in a University course". The objectives of the

study were: i) To compare students' achievement in two types of examination, open-book and closed-book examination, in a non-conservative setting. ii) To know the outcomes of the final examination reflect the work done in a course, iii) To identify the main effects of the two examination settings. Sample of the study were seventy-two sophomore and junior students at the University of Cyprus, enrolled during the Fall Semester in a course on "Theory and Teaching Methodology". The data analysis was done by using t-test. The major findings of the study were as follow. i) The open book examination does not assess diverse abilities than the closed- book examination when the examination is intended on the basis of critical thinking and higher order skills. ii) The outcomes of the study do help us achieve a deeper understanding of the effects of compatibility between teaching and testing. iii) The students who experienced the closed book setting performed slightly better in terms of total examination score than the students who experienced the open-book setting. iv) The fact that some students in the experimental group used the books for more than 50% of the total test time shows that they relied too much on the books, using them as substitutes for their own thinking. v) Students' perceptions about the relative ease of open-book examination may lead to less preparation; on the other hand students' expectations of a more threatening closed book examination may equally well result in increased preparation.

Loi and Teo (1999) conducted a study entitled "The Impact of Open Book Examinations on Student Learning". The objectives of the study were as follow: i) to identify students' preferences of examination mode (open or closed book) and the reasons for their preference. ii) To study the impact of open book examinations on students' learning processes throughout the course. Sample of the entire cohort of 794 students, there were 583 respondents, giving a response rate of 73.4%. The majority of the respondents were female (70.3%). Data analysis was done by the use of a series of t- tests, z-test & Chi-square test. The major findings were as follow: i) The results showed that more than 60% of the respondents preferred open book to closed book examinations. ii) The study indicated that the respondents' gender, year of study, origin of student, course background and experience were not related to their preferences. iii) The students who preferred closed book examinations showed that they perceived the examination to be more difficult than those who preferred open book examinations. Likewise, the same students found that the reference book(s)

brought with them for the examination were not helpful while those who preferred open-book examinations found that the reference book(s) were helpful. iv) The results show that reasons which were significantly related to mode preference are: less time-consuming for preparation, less memorization, and more room for logical thinking. The reason "less stressful" is not significantly related to the students' preference. v) Students who prefer open book examinations agree that such examinations will reduce the amount of time spent on preparation, make the learning process less stressful, require less memorization and allow more room for logical thinking. vi) After the open book mid-term examination, the students knew that unless they understood the concepts, they would not be able to pass the final examination as they would have no way to prepare model answers in advance. vii) The switch to open book examinations has made a noticeable impact on the learning habits of students. The teachers will also have to change their method of teaching as well. viii) To facilitate the shift to open book examinations, it is necessary to replace existing teaching styles with a more interactive mode of teaching.

Eilertsen and Valdermo (2000) completed a study entitled "Open Book Assessment (OBA): A Contribution to Improved Learning?" The sample of the study consists of 13 teachers and 350 students in three different schools. These 13 teachers were all working with the same curriculum, teaching a compulsory basic science course at two levels to students in their first year of upper secondary school. The major findings of the study were as follow. Teacher training students have shown a keen interest in OBA. Therefore OBA has considerable potential for changing and improving the traditions of assessment and the learning environment in general. Depending on the teachers' way of introducing, challenging, and supporting their students, most students' feel that they did not have to learn by rote like they did before and it is a relaxing effect on them. Student learned better because they felt 'free'. The student realised that the extensive practice of "crash-studying" or cramming when preparing for OB tests is not as successful as for ordinary tests & students in the respective class accepted OBA more readily than others. Furthermore, the study also found that students in technical and vocational branches had a more positive attitude towards OBA than did those in the general and academic branches.

Theophilides and Koutselini (2000) completed a comparative study on the behaviour in the closed book and the open book examination with the objectives to investigate the issues and to identify the characteristic study behaviour in the closed book examination and open book examination with reference to two stages of the examination process like preparing for the examination and taking the examination. The sample of the study consists of 276 students at the University of Cyprus. The research design was ex-post facto and relied on students' perceptions of the two examination types. Data were analyzed to assess mean differences in study behaviour between the two examinations, a series of paired-sample t-tests were performed and a principal components analysis was performed using the 39 statements of student behaviour. Major findings of the study as follow: a) Students expect an open-book examination they are more attentive throughout the semester and engage in more study activities that promote deep learning of the course subject matter than when anticipating a closed book examination; b) when students face an open book examination they use the knowledge gained in the course more creatively and feel more optimistic about their performance on the examination than when facing a closed-book examination; c) the behaviours favouring the closed book examination referred to the processes of collecting and storing information and having it readily available for use during the examination. The behaviours favouring the open-book examination referred to process-oriented activities having to do with interrelating information and focusing conclusions, exercising study skills, and promoting higher-order thinking through analyzing, synthesizing, and evaluating information; d) students working in an open examination context apply critical thinking, prepare detailed answers, work creatively and present their own thinking, and feel secure about the examination outcomes to a greater extent than when experiencing a closed book examination and the study behaviour was present to a higher degree in the open-book examination setting than in the closed-book examination context; e) the open book assessment procedure led students to apply "deep" approaches to learning when preparing for the examination as well as to creatively use their acquired knowledge on the exam. In essence, the examination itself became a learning process through knowledge transfer as well as exercise in thinking skills and offered the opportunity to acquire skills necessary for lifelong learning; f) the study suggests that the open book examination alternative reduces examination tension and stress. Study participants

work out their answers in a more relaxed way and they feel more confident about their performance and the open-book examination promotes critical thinking.

Brightwell et al. (2004) conducted an experiment whether an open book examination easier or not. The study provided the opportunity to examine the assumption and test it in a controlled manner in terms of the assessment of students during the study of an introductory University Anatomy and Physiology unit where students were required to complete two assessments. The first assessment was an online multiple-choice examination with 50 questions either reviewing concepts or requiring critical thinking and clinical applications. The sample of the study consisted of 196 first semester Bachelor of Science students at Edith Cowan University (ECU). Edith Cowan University is a relatively new university which is located in the city of Perth, Western Australia. The data were analyzed using a t-test. The major findings were: a) there was no significant difference between the mean scores achieved by students in the closed book and open book examination. The minimum and maximum scores for the closed book setting of the test were 22% and 88% respectively, with a mean of 55% and the minimum and maximum scores for the open book setting of the test were 30% and 88% respectively, with a mean of 57%; b) There was no significant difference between the mean score of those who completed the open book assessment within the time limit and those requiring more time to complete the assessment; c) The study also revealed that an open book examination tended to allow a non-significant improvement in the marks of the weaker students; d) The research had shown that students felt less anxiety when preparing for and completing open book assessments; e) It was interesting to notice that students spending more than 60 minutes on the assessment did not show any significant improvement in marks, while there was an add to the maximum mark achieved by students completing within the time limit of 60 minutes. It was concluded that a suitably constructed set of questions could be used to discriminate student abilities in either an open book examination or closed book examination.

Chan & Mui (2004) completed a case study from Hong Kong on the use of open book examinations to motivate students with the following objectives; a) to assess what preparations students have undertaken before taking open book examinations; b) to know learning style student adopted during the preparation of this non-traditional approach to subject testing and c) to identify the learning behaviour in closed book and open book examinations. 10 students were interviewed after a week of their open book examination that who had no prior experience about open book examination. The major finding were: a) The results indicated that, although students had a positive perception

towards open-book examinations, the preparation needed and the processing of information read in order to answer the examination questions were relatively minimal; b) Students appeared to need more guidance as to how they would be assessed and more trained on critical thinking; c) open book examinations can test students' mastery of knowledge on how well they are able to apply theories to new information. This is analogous to a relational and extended abstract of SOLO taxonomy; d) it encourages thinking at higher cognitive levels rather than in a spoon-fed style. e) Students' perception about open-book examinations may lead to less preparation; f) teachers should explain clearly what assessment criteria would be applied. It requires the ability to apply and extend a sound knowledge base. Marks should be awarded to a critical analysis of questions and rational answers only. Irrelevant answers should not gain any credit; g) students had preferences for some types of questions in some particular areas that they felt that they were strong in or had an interest in; h) teaching and learning requires higher order thinking and critical analysis, such as reasoning, conceptualizing and problem solving techniques and i) open book examinations could reduce the stress and anxiety of students.

Loi and Yuan (2005) completed a survey on open book examinations with the objectives to examine students' perceptions of the open book examination; to investigate students' preferences for this kind of assessment by their background and to examine their perceptions of the open book midterm examination and the reasons they gave for their preferences. A first year Business Statistics course was selected to be the first subject to implement the open book examination in the school of Accountancy and Business, Nanyang Technological University. There were a total of 583 respondents out of 794 students. A survey was conducted with the help of self-constructed questionnaire after an open book midterm examination. The statistical test (z-test) and t-test was used for the calculation of the collected data. The major findings were: a) the study shows that more than 60% of the students prefer open book than closed book examinations. The preferences are not related to gender, year of study, and origin of student, course knowledge and experience but only related to the major field of study; b) The findings indicate that most students found that the mid-term examination was difficult, especially for students who prefer closed-book examinations. Students who prefer open-book examinations found that the reference book was helpful during the examination; c) The analysis also shows that the reasons

"less time-consuming for preparation", "less memorization" and "more room for creative thinking" are significantly different according to mode preference and d) Overall, more students prefer open-book to closed- book examinations. The finding of a positive response toward the open-book examination augurs well for extending such an examination to other subjects. It is essential to implement the system appropriately to match up with the subject, teaching and learning.

Vanderburgh (2005) completed a study on open book examination and student authored questions as useful tools to increase critical thinking. The study was carried out on the students of undergraduate physiology discipline. The sample of the study consists of 42 students of undergraduate physiology discipline. The findings of the study stated that the open book examination and student authored questions evaluation method in undergraduate physiology appears to be beneficial for and received well by students. It may promote a higher level of critical thinking and increased emphasis on writing skills and be more conducive to expedient grading (computer scoring). Probably, it requires more time for examination development and homework grading.

Francis (2006) conducted a study on a Case for Open-Book Examinations. The major findings stated that the OBE reduce students' test anxiety and reduce to memorise factual material. The study also reveals that effect of using open-books in an 'A' level GCE examination in English Literature showed that because the examination was intentionally designed to use texts and notes in the examination, students acquired higher levels of attainment than their peers who took a traditional close book examination.

Phillips (2006) completed an experiment for examining the effect of using open book tests to strengthen the study skills of Community College biology students with the sample consist of 1,080 community-college students who were identified as completers in General Biology I classes. The statistical technique like paired-sample t-test and a t-test were used for the dada analysis. The main findings stated that open book tests can improve students' ability to use a reference text effectively and efficiently and there was a significant difference between the initial open-book test and the final open-book test. The study also revealed that open-book tests are not successful in improving the study skills of students who already have strong reading abilities, they do provide an opportunity for students to use their study skills and OBT

cannot be used to assess students' study skills in a college setting but the weak study skills students exhibited a more dramatic improvement over the course.

Agarwal et al. (2007) did an experiment for examining the effect of open book testing. Students of the experimental group view notes and text books during test, and the control group appeared closed book tests without viewing notes or textbooks. The findings stated that open book testing led to better early performance than closed book testing, but this advantage did not carry on and both types of testing producing equivalent retention on a delayed test.

Williams & Wong (2007) completed an experiment for examining the effectiveness Closed book as invigilated examination versus Open Book Open Web (OBOW) examination with the sample consists of 54 students. The major findings stated that in the judgment of the students OBOW is superior to the closed book, invigilated option on all counts. The result on the basis of opportunities is also the same; namely, that there are broadly similar opportunities. The findings also highlight the importance of authentic assessment principles, such as the incorporation of real-life learning process and unstructured problems that require the application of relevant skills and knowledge engages the students and inculcates deeper and enriched learning.

Kruger (2008) did an experiment for an evaluation of open-book examinations used in the training of professional accountants. The objectives were to gain a better understanding of how OBA has affected the learning and teaching environment in the training of professional accountants and to assess the usefulness of OBA with specific reference to whether students and lecturers are of the opinion that SAICA and the IRBA have succeeded in reaching their objectives with the implementation of open-book assessment; to perform a literature study of recent research done on OBA; to gain an understanding of the effects the open-book policy had on the study behaviour of students from the viewpoint of both students and lecturers; to compare the view of lecturers and students on whether lecturers changed their approach to teaching compared to when assessment was done by means of a closed-book examination; to gain an understanding of the effects the open-book policy had on the behaviour of students when writing examination from the viewpoint of both students and lecturers; to get the opinion of students and lecturers on when students should be exposed to open-book assessment; to determine what the best format (closed, partially open, fully

open for any material) for the examination is from the viewpoint of both students and lecturers; to make recommendations as to how teaching and assessment should be approached in an OBA environment; to determine how the fact that allowed texts are only available in English affected students who receive tuition in Afrikaans. The sample consists of 1490 students, enrolled at the different universities. Data analysis was done by using the statistical tests including frequency analysis, summary statistics indicating percentages of students who selected a particular option, ranking of preferences based on the level of agreement on statements. The research findings stated that OBA has changed the learning behaviour of most students to a deeper approach. Lecturers however feel that the general learning approach of students has suffered. The negative study behaviour typically encountered in an OBA environment seems to be overestimated and can be reduced with earlier exposure and following the right teaching strategies. The result also creates a strong argument for introducing OBA earlier, which seems to be well supported by students and lecturers for at least the third year of study, with significant but lesser support for the second year of study, and the result also reveal that time constraints for examination will always be a controversial issue and this study does not attempt to find a concise answer and most of the students and lecturers agreed that OBA caused a reduction in their anxiety levels.

Rajput (2008) completed a survey study for examining the effect of the evaluation process through OBE with the objective to know the opinions of secondary school teachers about OBE with reference to area and gender. School Teachers of 10 secondary schools of Patan Taluka were taken as sample randomly by the investigator. An opinionnaire was formed by the investigator that was used for data collection. The finding stated that the difference was found in the opinions of urban teachers and rural teachers, male and female teachers about open book examination. Teachers from city areas were more incline toward OBE and in this context Females are more positive than male teachers.

Vaghrodia (2008) completed a survey type study taking the opinions of teachers, students and guardians towards Open Book Examination with the help of the objectives to know the opinions of students, teachers and guardians toward probable effect of open book examination. 20 schools from Ahmadabad City were selected as

the sample of the study. A self constructed opinionnaire was employed for collect of data. The findings stated that 88% teachers were familiar with the structure of OBE, whereas 80% teachers were not interested to apply OBE. Teachers were in favour of complete changes in the text book, question paper and evaluation system in case of applying OBE; teachers were accepting that OBE will improve students understanding power. 54% students were not interested for the new system instead of applying OBE because they will have to work hard and 75% students viewed that they have to concentrate more in study but their fear will be reduced. The 63% guardians were not in favour of OBE, but 73% guardians accepted that if this system will be enforced, they will not required tuition for their child and more than 50% guardians believed that examination fear will be reduced in students as well as their guardians by this OBE system.

Chaudhari (2009) did a survey taking the opinions of teachers about OBE. The sample of the study consists of all the teachers from four schools of Patan Taluka selected randomly. A self constructed opinionnaire was employed for data collection. The Findings of the study stated that teachers were in favour of OBE and they believed that by acceptance or use of OBE resolved the problem of wastage and stagnations and a common nuisance of copying during examination.

Patel (2009) did a survey to know about a new planning for application on standard IX students about OBE with the objectives to compare between traditional method and OBE with reference to educational achievement, to construct a question paper for both traditional method and OBE, and to check the effect of OBE. The sample of the study consists of 43 teachers and 100 students of 3 schools from Gandhinagar district selected randomly. An achievement test and a self constructed opinionnaire were employed for collecting data. Survey method was used for data collection. The findings of the study stated that students have insufficient time to complete the paper by OBE system when students can write their paper completely by using traditional method and student from urban area shown good performance compare to rural students in open book examination.

Siddik (2009) conducted a study to know the opinion of secondary school teachers about open book examination (OBE) with respect to the components like gender, experience, stream and type of school. The sample of the study consists of teachers

from 30 secondary schools of Ahmadabad district selected by stratified Random sampling method. A self constructed opinionnaire were employed for collecting data. The findings of the study show that most of the teachers possess positive opinions towards OBE and the male and female secondary teachers have similar opinions towards OBE. Teachers who belonged to science streams subject have more positive opinion than arts stream subject teachers, experienced teachers and un-experienced teachers having similar opinions towards OBE. Types of school and stream don't differ on teachers view about OBE, stream and gender don't make differ on teachers view about OBE and Gender and length of experience don't make differ on teachers view about OBE.

Thakar (2009) did an experiment to know the views of teachers about OBE with the help of the following objectives to know the free views for learning process and evaluation process of primary, secondary and higher secondary teachers on present approach. 50 teachers of primary, secondary and higher secondary schools from Mehsana district of Gujarat were selected randomly as the sample for present study. A self constructed questionnaire was employed to know the free views of teachers about OBE. Finding shows that 50% teachers were in favour of OBE, and 30% teachers were in favour of changing the traditional learning process in case of applying OBE.

Vyas and Vyas (2009) did an experiment for comparing open book examination and close book examination with the objectives to compare and study the effect of examination anxiety and to compare the effectiveness of open book examination and closed book examination with reference to Examination Achievement on trainee's achievement for first year trainees of P.T.C. College who gave their examination through open book and closed book examination pattern. The sample of the study consists of 76 first year trainees from one self-finance. P.T.C. college of Himatnagar city of Gujarat states selected with the help of purposive cluster sampling technique. The self constructed tools like achievement test for the subject evaluation and measurement and examination anxiety test were used for data collection. The findings of the study state that the traditional closed book examination pattern showed high examination anxiety on the trainees, while the open book examination pattern showed lower anxiety level compared to the closed book examination pattern and the findings also reveal that examination pattern whether it is open book examination or closed

book examination does not affect achievement of trainees.

Agarwal & Roediger III (2011) conducted an experiment to examine the expectancy of an open book test with the objectives to know how students would study following non-specific expectancy instructions, to know whether test expectancy instructions before studying would influence final retention after two days on delayed fact, comprehension, and transfer tests and to know how students' self-selected study strategies would influence final preservation after two days. The sample of the study consists of a total 108 subjects and a total of 72 participants for first and second experiment from the Department of Psychology. Statistical technique like t-test and one way ANOVA were used for analysis of the collected data. The main findings of the study state that first experiment obtained significant testing effects following both open-book tests and closed-book tests with feedback, in second experiment the main finding was that participants studied for less time when expecting an open book test and correspondingly performed worse on later retention tests. Expecting an open book test led to poor performance on all three types of items on the delayed criterion test. Though initial retrieval practice during a closed book test has no different effect from practice on an open-book test, the expectation of a final closed-book test seems to be a more potent factor influencing long-term learning.

Biswal and Das (2011) did an experimental study on open book instructional system (OBIS) at Higher Education with the objectives to compare the achievement of students in Research Methods in Management ((RMM) during close book evaluation system and open book evaluation system; to study the attendance of students over a period of time during close book evaluation system and open book evaluation system, to study the participation of students in the classes, the pattern of answers written by the students and the reaction of students about the open book evaluation system. The sample of the study was taken purposively consists of a total 301 MBA students of Evening Programme of Faculty of Management Studies, MSU from the year 2000 to 2009 those have studied RMM. The researcher designed open book evaluation system consists of open book instructional environment and open book examination. The main findings of the study state that mean achievement of the students in RMM showing to open book evaluation system was quite similar to the mean achievement of the students in RMM taught in a traditional close book evaluation system. Mean

attendance, participation in class room discussion; understanding about the content, use of varied types of reference materials were increased by the students in the open book evaluation system. Students were found more satisfied with their answers. The positive reaction of the students was found those were exposed to open book evaluation system.

Gupta (2011) did a comprehensive experimental study on achievement of B.Ed. students examined through OBE and CBE with reference to certain objectives. The main objectives of the study were i) to study the overall achievement of B.Ed. students examined through OBE and CBE, ii) to compare the comprehension ability, application ability, analyzing ability, synthesizing ability, of B.Ed. students examined through open book examination and closed book exam, iii) to study the achievement of B.Ed. students examined through open book examination and closed book examination with respect to gender i.e., male and female, their entry qualification i.e., Graduate and Post Graduate. The sample of the study was taken purposively consists of a total 78 students from the CBE practicing college and 80 students from OBE practicing college students from the two English Medium B.Ed. Colleges. For data collection four self constructed academic achievement tests were constructed one for each core compulsory course of B.Ed. programme. The main findings of the study showed that OBE students scored higher than CBE students in terms of their overall academic achievement and in all the three categories i.e. above average, average and below average students, OBE students scored higher achievement and scored more in comprehension level, in application level, in analysis level, in synthesis level, than CBE students. Both male and female students scored higher in OBE than CBE. Gender did not have any impact on overall achievement in OBE environment. Entry qualification did not affect the academic achievement of students in OBE. OBE and CBE undergraduate students did not have any difference in academic achievement. OBE postgraduate's category students obtained more score in academic achievement than CBE postgraduate category students.

Mekala (2011) completed a qualitative survey on open book examination. The self constructed questionnaire was administered for survey the students of National Institute of Technology (NIT), Trichy. The data was collected by the help of random sampling and sample consist of 75 students by the questionnaire aimed at bring out

feedback regarding their attitude towards open book examination. The data were analysed by qualitative discussions by the experts. The finding of the study shows that OBE provides insights into learner's perspective of their assessment procedures and the objective of an examination is to make the learner comprehend, analyse, relate and present facts coherently. The survey makes a evident that OBE holds good for the tertiary level engineering students, having fulfilled the requirements of an assessment tool and a learner centered approach.

Petrides et al. (2011) conducted a study entitled “Open textbook adoption and use: implications for teachers and learners”. The Community College Open Textbook Project (CCOTP) was developed to support the use of text books that are freely accessible and available online and that can be modified by teachers and learners to meet their exclusive needs and contexts. The research study was conducted by the Institute for the Study of Knowledge Management of Education (ISKME) on CCOTP. The study examined the receipt and use patterns of teachers and learners as end users of open text books. The finding that shows significant early drivers of use incorporated reduced cost, consistent quality and effortlessness of use and that teacher and learners use open text books in ways that mirror their existing teaching and learning process. The study also showed the possibility for new teaching and learning behaviours united to the use of open textbooks, including increased teacher collaboration on curriculum development and the interactivity of open materials as an enhancement of student learning. The study predictable challenges for the sustainability of the open text book model including teacher technological competence and specific development that supports open text book.

Ranjan (2011) completed a survey on open book examination with the help of experiment, analysis and results. The main objective of the study was to know the reaction of B.Ed. students towards the open book examination. The sample of the study consists of 84 B.Ed. trainees of Way made College of Education. Data were collected through a self-constructed reaction scale after the OBE. The collected data were analyzed by using percentage, frequency and content analysis method. The findings of the study stated that majority of the student-teachers have favorable reactions towards OBE. The students expressed that OBE is helpful to them as

students in many ways like developing higher order thinking skills, for obtaining depth understanding as well as lengthening one's point of view.

Kumari (2011) completed a survey to know the opinions of school teachers about open book examination with respect to gender of teachers, stream and level (secondary and higher secondary) at which they are working. By using stratified random sampling method teachers were selected and represented as sample for the study from 30 secondary schools from Ahmedabad city of Gujarat. A self-constructed Opinionnaire was used for data collection. The findings of the study stated that most of the teachers have the positive opinion towards OBE and opinion regarding OBE was not found affected by gender and stream of teachers of secondary and higher secondary level.

Therriault et al. (2011) completed an exploratory study for examining open-book problem-solving in engineering students with the sample of 8 senior materials science students and engineering students at Large Public University in the south-eastern US. Total 40 students were participated in the program. For the data analysis the statistical techniques like median and correlation were used. Findings of the study stated that reading or searching the textbook consumed the largest portion of participant's problem solving time and was always negatively associated with their performance; In comparison to the low-performing participants, examples from high-performing participants often illustrated purposeful uses of the text book. These students had a plan regarding what to search for and how to access the book effectively. This training would serve not only to improve examination performance, but to educate students in effective use of resources for professional practice where open-book problem solving was the norm; results showed that students performance could be hindered by an over reliance upon the textbook and this may lead to ineffective time management; results emphasis on the importance of training students who were using resources effectively during open book examinations to avoid distractive behaviours.

Unnikrishnan (2011) completed a comparative study of the test anxiety of students examined through closed book and open book examination with the objectives to compare the level of test anxiety of learners examined through open book and close book examination and to compare the level of test anxiety of male and female learners

examined through open book examination and examined through close book examination. The sample of the study selected purposively. The sample of the study consists of 128 B.Ed. students from two B.Ed. colleges of Gujarat. V.P. Sharma's test anxiety scale was used for collecting the data. The findings of the study stated that the mode of examination (Open book and close book) does not have any effect on test anxiety of learners and test anxiety is not sensitive to gender (male and female) when examined through open book examination and examined through close book examination.

Block (2012) completed an experiment to know the effect of open book and closed book examination on students' achievement in an Introductory Statistics Course with the sample consists of 260 students in each semester. For analyzing the data statistical technique like mean and probability were used. The findings of the study stated that the students liked open book examinations unless they think the examinations were harder. The end of course assessment showed that the changes in the examination policy over the last three semesters had an effect on increasing student satisfaction with the course. The last examinations scores did not decrease with the policy changes and teacher told better prepared students. When students were told the examinations were closed book they came with better prepared for the test and the teacher observed that the students spent more time for formulating and writing their answers on the closed book final examinations compared to the open book examinations. Closed book examinations that allowed handwritten note cards were associated with, and may be partly responsible for, increased student preparation and enjoyment of the course, and the note cards were not much used by the student as they got the text book at the time of OBE.

Gharib, Phillips & Mathew (2012) completed a comparative study on cheat sheet or open book to know the effects of examination types on performance, retention and anxiety. The main objectives of the study were: a) to know the examination anxiety during examination; b) to measure the effectiveness of the examination by comparing examination scores, asking students about their preferences, measuring long-term retention of material on quizzes several weeks after the exam, and measuring anxiety levels immediately before the examination and c) to compared the effectiveness among open-book, closed-book, and cheat sheet examination in different classes. The

study consists of 396 undergraduate students enrolled at a small Liberal Arts University as the sample. For analyzing the data paired-samples t-tests and ANOVA were used. The major findings of the study stated that the quality of the cheat sheet was not related to scores on cheat sheet examination in Introductory Psychology, but there was a positive correlation between cheat sheet quality and cheat sheet examination score in Statistics; the study also revealed that closed book examination resulted in lower scores than either open-book examination or cheat sheet examination and cheat sheet examination resulted in lower scores than open book examination and the students in both classes predicted that they would do better on open-book or cheat sheet examination compared to closed book examination. The test anxiety measured right before the examination was negatively correlated with scores on the examination and the paired-samples t-test finds the higher anxiety scores during cheat sheet examination compared to open-book examination in both Introductory Psychology and Statistics.

Sharma (2012) completed a comparative study to know the effectiveness of open book examination and traditional examination method in secondary schools. The objectives of the study were to develop a teaching program for a unit of Sanskrit subject for the students of IX standard; to frame a post test on the selected unit for the selected class; to compare the result of the objective question obtained by the students in the open book and traditional examination method; to compare the result of the short question obtained by the students in the open book and traditional examination method; to find the more effective examination method on the basis of the achievement in the post test and to find the behavioral significance and behavioral effectiveness of the research study. The sample of the study consists of 67 students. Self-constructed achievement test was used as a tool to measure achievement. The major findings of the study stated that the achievement of the students was found to be higher with the OBE in the post test; the achievement of the students in the objective question was found significantly higher with the open book examination in the post test; the achievement the students in the short question were found to be equal in OBE and traditional examination in the post test and the open book examination was found to be behaviourally significant and effective.

Youssef and Ryan (2012) completed a study on the relationship between examination format and learning effectiveness with the objective to assess the influence of examination format on the learning effectiveness from outcomes of the midterm and final examinations of selected freshman and junior engineering classes. The total number of students participating in the freshman course was 106, while the junior level course had 56 students. For reliability in evaluation the same teacher graded the common problems for all the courses and a common question was prepared for all students during the final examination. The findings stated that the design of examination affects the study habits and examination result, is supported by the results from both the class groups.

Gamit (2013) completed a survey on status of awareness and preparedness of CBSE schools in Vadodara city about the open book examination with the following objectives to study the preparedness of the principals and the teachers of CBSE schools in Vadodara City about OBE and to study the awareness of the teachers of the same school about OBE. The sample of the study was taken with the help of random sampling technique and 10 CBSE affiliated schools were selected from Vadodara city using lottery method. All the teachers and principals of those schools were taken as the sample of the research. The self-constructed questionnaire, perception scale and a semi structured interview schedule was used to collect the data and data were analysed by using frequency, percentage and Intensity Index. The major findings of the study stated that; a) most of the Principals were aware that the CBSE was planning to introduce OBE in standard X and XII during the academic session 2013-14 but they were not aware of the modalities to be adopted for the OBE as they had not received any circular from the CBSE regarding the same. Most of the principals expressed the need for clear guidelines from CBSE and proper training and orientation of the teachers as well as the principals; b) the overall observation of the teachers towards the OBE was favourable. So it can be observed that teachers regarded the OBE in a positive manner considering that it would be implemented in future; c) an average number of teachers were aware about the fundamentals of OBE, and the difference between OBE and closed book examination. Some of the teachers were aware about the questions that were to be asked in OBE, and most of the teachers were aware about the nature of teaching and learning needed for an open book test and the environment that had to be created for the OBE.

Gharib and Phillips (2013) completed a study entitled “Test Anxiety, Student Preferences and Performance on Different Examination Types in Introductory Psychology”. The major objectives of the study was to measure the anxiety of the student in both examinations; to know the differences between cheat sheet and open book examination in introductory psychology classes and to measure the examination preference and study time. The sample of the study was taken from Liberal Arts University with a number of 225 undergraduate students (176 females, 49 males) enrolled in 5 sections of introductory psychology. Mean, median, standard deviation and t-test were used to analyze the collected data. The findings of the study stated that the students did a little better with lesser levels of anxiety on OBE than on cheat sheet examination and the students also reported studying less for open book examination but favoured the open book tests.

Karagiannopoulou & Milienos (2013) completed a study entitled “Exploring the relationship between experienced students’ preference for open and closed-book examinations, approaches to learning and achievement”. 144 Greek undergraduate (56 third year and 88 fourth year) students were taken as sample of the study from Philosophy, Education and Psychology Department. The approaches were tested by the Approaches and Study Skills Inventory for Students (ASSIST) and the examination preferences for open or closed book examination were assessed by 3 self report questions. The findings of the study stated that students who preferred the open-book examination scored lower on “time management”, “achieving”, and “unrelated memorizing”; the deep profile students (mainly 3rd year students) seem to prefer the open book examination but appear unorganized in their study in a similar extent to surface-profile students and they also reported low achievement. The study also cautiously suggests the influence of the year of study on students' assessment preference.

Zulfia (2013) completed a study on the open book examination in terms of the achievement and anxiety of standard VIII students with the objectives to study the impact of the OBE on the level of examination anxiety on standard VIII students and to study the impact of the OBE in terms of the achievement of standard VIII students in different subjects i.e. English, Science, S.S., Mathematics, Hindi, and Gujarati. One of the Grant-in-aid schools from Vadodara city was selected purposively as the

sample of the study which follows the GSHSEB syllabus. Data was analyzed with the help of qualitative and quantitative data analysis technique. Content analysis technique was used to know the answers of the students in achievement tests. The findings of the study stated that significant difference was found in the mean achievement of standard VIII students in their close book examination and OBE for the subjects of Science, where the mean science achievement score of OBE was found significantly greater than their mean science achievement score in close book examination; no significant difference was found between the mean examination anxiety level of students those appeared in the close book examination and OBE and no significant difference was found in the mean achievement of standard VIII students in their close book examination and OBE for the subjects of English, Social Science, Mathematics, Hindi, Gujarati and in overall achievement.

Chatterjee (2014), completed an experiment on teaching economics to standard XI students for open book examination (OBE) with the objectives to develop OBE strategy and to study the effectiveness of the developed strategy for teaching economics to standard XI students for OBE and to teach Economics to standard XI students with the help of the developed strategy for OBE. Quasi Experimental design was used in the study. Two schools with commerce stream were selected purposively as the sample of the study selected from Vadodara city. To analyze the quantitative data statistical technique like Mean, Standard Deviation, Standard Error of Mean and Mann-Whitney U-test was used. The findings stated that the significant difference was found in the mean achievement scores of the standard XI students of experimental group and the control group. The students taught economics through the developed strategy for OBE scored more than the control group. The developed strategy integrated content presentation through power-point, collaborative learning activities with cognitive questions, cross group sharing and deliberations, putting knowledge into action, concept mapping for the standard XI students of experimental group helped in enhancing their achievement of the scores in comparison with the students of counterpart.

Jalal, Fadhil and Hasini (2014) completed an experimental study on student's assessment through open book concept for final examination with the sample consists of 84 students from 3 sections. The findings of the study stated that the results of the

open book assessment were depressing and the students were more confident and performed better in close book compared to open book conditions; the students with lower mark were not well prepared in strategizing the answering technique; students can only do well in the open book assessment if they were properly ready and have a deepest understanding on the existing and prerequisite subjects. The finding also indicates that students' performance was negatively associated with their dependence upon the textbook and the students performed better in traditional assessment compared to open book assessment and this maybe happen due to the fact that students were not properly ready for open book concept, less preparation and they had false confidence as they thought the all answers, techniques and methods are given in text book.

Jana (2014), in an article on teacher competencies for open book examination suggests that there is an immediate need to find the ways out for the teaching learning in an open book environment (OBEn) by the help of proper attitude towards teaching in an open book examination, planning for creating a learning environment for open book examination, preparing cognitive lesson planning for open book examination, ICT Integration needed in Schools, teachers' ICT usage, competence to induce the devolution of this situation by the learners, organization of orientation programme for the teachers to improve their competency in teaching and Seminars and workshops on open book examination have to be conducted.

Biswal (2015) completed an experiment on the open book examination (OBE) system for secondary school students in different teaching learning environments with the objectives to design and implementation of an open book environment for standard VIII students for all subjects and to study the effectiveness of the open book environment in terms of the achievement and the reaction of students. Two schools under GSHSEB were selected purposively as samples of the study from Vadodara City during the academic year 2013-14. The data were collected through self constructed achievement tests. Data were analyzed by employing statistical technique like Mean, Standard Deviation, Standard Error of Mean and Mann-Whitney U-test and the data collected through reaction scale was analysed quantitatively with the help of percentage and Intensity Index. The findings of the study shows that open book environment helped students to write answers in a better way in both open book

testing and close book testing with divergent ideas, content knowledge and sound logic along with the comprehension of the subjects. It also helped students to score better in their overall achievement; in an open book testing, open book environment was found significantly better than traditional environment in enhancing scores in 23 components out of a total of 32 components of all the subjects; in an open book environment the result of close book testing and open book testing were found similar in most of the subjects; in a close book testing, open book environment was found significantly better than traditional environment in enhancing scores in 22 components out of a total of 32 components of all the subjects; both open book environment and open book testing were found significant in terms of the reaction of students and in a traditional environment the result of close book testing and open book testing were found similar in most of the subjects.

Das (2015) completed an experiment on the open book examination system at secondary school with the objectives viz. i) to design and development and implement of an open book examination system for standard VIII students; ii) to study the effectiveness of the developed OBE system in terms of the content knowledge, logic, divergent thinking, comprehension, achievement and the reaction of students of standard VIII and the teacher who teach them. Sample of the study was selected purposively with the help of quasi-experimental design for collecting the data. The collecting data were analyzed by employing statistical technique like Mean, Standard Deviation, Standard Error of Mean and Mann-Whitney U-test. With the help of percentage and Intensity Index the collected data through reaction scale was analysed quantitatively. The findings of the study shows that OBE system was found significantly effective in comparison to traditional examination system in enhancing scores in most of the subjects; students and teachers showed their positive response in most of the components related to open book environment and open book testing (OBT).

Maity (2016) conducted a study entitled “Effectiveness of open book examination in English for standard VIII in different environments”. The main objectives of the study were i) to design and develop an Open Book Environment (OBEn) for standard VIII students in teaching English, ii) to implement the developed Open Book Environment (OBEn) for standard VIII students in teaching English, iii) to study the effectiveness

of the Open Book Testing (OBT) in a traditional close book environment in terms of content knowledge, logic, divergent thinking, comprehension and overall achievement of standard VIII students in English, iv) to study the effectiveness of the Open Book Testing (OBT) in an Open Book Environment (OBEn) in terms of content knowledge, logic, divergent thinking, comprehension and overall achievement of standard VIII students in English, and v) to study the effectiveness of the Open Book Environment (OBEn) in a Close Book Testing (CBT) in terms of content knowledge, logic, divergent thinking, comprehension and overall achievement of standard VIII students in English. Two English medium secondary schools, both affiliated to Central Board of Secondary education were selected from Vadodara city in the academic year 2013-2014. As the sample of the study was taken purposively, quasi-experimental design was used. The collected data obtained through achievement tests were analyzed by employing quantitative data analysis techniques. Mean, Standard Deviation, Standard Error of Mean and Mann-Whitney U-test were used to analyze the quantitative data collected during semester I semester II. Data collected through reaction scale was analysed quantitatively with the help of percentage and Intensity Index. The major findings of the study were a) in a traditional environment the result of Close Book Testing (CBT) and Open Book Testing (OBT) were found similar in content knowledge, logic, divergent thinking, comprehension and achievement in English, b) in an Open Book Environment (OBEn) the result of Close Book Testing (CBT) and Open Book Testing (OBT) were found similar in content knowledge, logic, divergent thinking, comprehension and achievement in English, c) in a Close Book Testing (CBT), OBEn was found significantly better than traditional environment in enhancing scores in content knowledge, logic, divergent thinking and achievement whereas, in the same testing OBEn was found similar to traditional environment in comprehension only, d) in an Open Book Testing (OBT), OBEn was found significantly better than traditional environment in enhancing scores in content knowledge, logic, divergent thinking, comprehension and achievement, e) both Open Book Environment (OBEn) and Open Book Testing (OBT) was found effective in terms of the reaction of students. The students taught through OBEn showed their positively agreed response in most of the components related to OBEn and OBT separately and as a whole and f) OBEn helped students to write answers in a better way in both OBT and CBT with content knowledge, divergent thinking and sound logic in English. It also helped students to score better in their overall achievement.

2.1.3 STUDY CONDUCTED IN THE AREA OF THINKING

Govatana (1977) conducted a study entitled “a Comparative study of Creative thinking in relation to socio-economic status, school climate and classroom Behaviour of High School students in Baroda City (India) and Bangkok City (Thailand)” Objectives of the study were i) to compare creative thinking of Indian students (Baroda) and Thai Students(Bangkok), ii) to study the relationship of creative thinking of High School students in accordance with their socio-economic status, school climate and classroom behaviour, iii) to study the interaction effect of country, Socio-economic status, school climate and classroom behaviour upon creative thinking. It was a descriptive correlated study which involved variables of creative thinking as criterion variable and socio-economic status, school climate and classroom behaviour as variants. Sample of the present consist of all the secondary school students with age range 13+ to 16+ years of grade IX in Baroda City (India) and Bangkok (Thailand). The Passi tests of creativity (verbal form), the Torrance tests of creative thinking and the organizational climate descriptive Questionnaire were used as the tools. The correlational and factor Analysis Approach were used. Major findings were i) socio-economic status has impact on creative thinking scores of both the Indian student and Thai students, ii) there was no interaction effect among country socio-economic status and school climate of the students upon their creative thinking, iii) there is no interaction effect among country socio-economic status and classroom behaviour of the students upon their creative thinking and iv) there exists no significant difference in creative thinking scores of the students for Indian, Thai with respect to Sex.

Shah (1981) completed an experimental investigation of the effects of selected teaching strategies on the development of creative thinking and achievement in Science with the following objectives to find out the effectiveness of the strategies on the development of creative thinking ability of standard VII pupils and to find out the effectiveness of the strategies on the achievement in Science of standard seventh pupils. The 44 Latin square Design was used in the experiment with the sample of the study consist of the pupils, the teachers and the unit of teaching involved for the requirements of the experiment. Tools in the study were used for two purposes. The first purpose was to describe the nature of the sample, and for this I.Q Test, Creative

Thinking Test (T.T.C.T. Figural version) and pre-achievement test were administered and the second purpose was to measure the development of creative thinking and the achievement of the pupils, as a result of treatment variables. This purpose was served by administering corresponding tests of Creative thinking and achievement, prepared by investigator. Data were analysed by applying the various statistical techniques like means, SD, Correlations and analysis of Variance (ANOVA). The major findings of the study showed that the difference existed between the selected strategies for their effectiveness in developing creative thinking and achievement in science of seventh class pupils is significant at .01 level of significance, it is also found that the four strategies of teaching had significantly differential effects on the development of originality and flexibility of seventh class pupils but the F ratio for the effects of strategies was found to be not significant in the case of fluency, St4 (lecturing +discussion +Practical works +use of A.V. aids.) was more effective in developing creative thinking and its components as compared to all other strategies, it is observed that the effects of strategies were dependent upon the level of intelligence, sex and creativeness of the pupils, St3 i.e. dominance of practical work did not show any significant superiority over lecture with respect to low intelligence, low creativeness and girls, the results highlighted the importance of having the maximum use of A.V. Aids in the classroom teaching for enhancement of creative thinking and it was found that the st4 produced significantly high mean scores for achievement of the pupils than all other strategies. Strategies st3 and st2 produced significantly higher mean scores than st1 and there was no evidence of significant difference between st3 and st2. Note:- (st1- lecturing, st2- lecturing+ Discussion, st3- lecturing + Discussion + Practical works and st4- lecturing + discussion+ practical Works + use of A.V aids.)

Meghani (1999) did a study on the effectiveness of a teaching-learning strategy to develop critical thinking in students of standard XI using psychology as content. The main objectives of the study were to find the effectiveness of the evolved strategy for teaching critical thinking; to develop a tool, measuring critical thinking in students of standard XI; to evolve a strategy for teaching-learning critical thinking in students of standard XI using the subject Psychology as the content. The sample of the study comprised of 12 students of standard IX (English medium), who had opted for Art Stream and had Psychology as one of their subjects in the academic year 1997 in Navrachana Higher Secondary School, Vadodara affiliated to CBSE. The design employed for the study was

one group pre-test-post-test design. The major findings of the study showed that students demonstrated their ability to think independently through logical reasoning and justification having the ability to evaluate arguments/beliefs/opinion and a few students learnt to compare and contrast analogies; the result of the t-test shows that the evolved strategy for teaching learning critical thinking has been effective in developing critical thinking in students; students showed the ability to think dialectically and they were able to apply knowledge in a new situation; students show improvement on their ability to think reflectively and they were also imbued affective dimensions of critical thinking like intellectual autonomy, intellectual empathy, intellectual courage and intellectual humility; almost all students demonstrated critical reading skills and showed improvement in questioning skill.

Paily (1999) conducted an experiment on development of critical thinking among secondary school students in relation to some psycho-contextual variables. The main objectives of the study were i) to establish the norms for critical thinking ability, ii) to know the levels of critical thinking, iii) to know the correlation between critical thinking and intelligence and iv) to know the correlation between critical thinking and academic achievement of the secondary school students in the state of Goa. For the analysis of data a descriptive comparative survey method was used in this study. Total 27 schools of each of the four categories were selected using stratified random sampling technique. The final data producing sample was consisted 918 students of Class X in the state of Goa. The main findings were as follow. The use of different critical thinking teaching strategies by teachers in teaching different subjects helps in developing critical thinking ability of the students. Standard X students included in the study found to have average level of critical thinking; significant positive but low correlation between critical thinking and intelligence; significant positive but low correlation between critical thinking and academic achievement were observed.

Lee (2004) conducted an experiment on the effects of divergent thinking training/instruction on Torrance 65 tests of creative thinking and creative performance. To analysis the data quasi experimental design was used by the researcher with the pre-tests and the post-tests method. The Torrance test of creative thinking and story based problem solving tasks was also used for data analysis. The open instructions for uniqueness improved the originality scores on creative work

sheets and open instruction for fluency enhanced the fluency scores on both figural and verbal creative work sheets for experimental group students in this experiment.

Ranganathan (2006) conducted an experiment on 'The Effect of Interactive Teaching in Developing Thinking History at High School Level'. The main objectives of the study were to study the efficacy of teacher interactive method, student interactive method and self learning in developing thinking history of high school in terms of sex, type of school and locality, to study the opinion of teacher interactive method and student interactive method in developing thinking history, and to compare the opinion of high school students towards the teacher interactive method and student interactive method in developing thinking history. Cluster sampling technique was used for the study. The sample of the study consists of 1440 students. The major findings of the study were as follow. The interactive method viz students interactive method, teacher interactive method and self learning made a significant effect upon the performance of the high school students in thinking history, students interactive method, the study revealed that the opinion of male and female students towards interactive methods viz. teacher interactive method, student interactive method and self learning did not associate positively as far as the schools like government and private concerned, and teacher interactive method and self learning did not had any effect upon the interaction between the method and gender, method and locality and gender and locality.

Kaur (2009) completed an experiment on the effectiveness of outdoor environmental education program for enhancing critical thinking, social skills and responsible environmental behaviour among V grade students. The main objectives of the study were as follows. To study the relationship between critical thinking and responsible environmental behaviour of grade V students; to compare the effectiveness of outdoor environmental education program and traditional instruction for enhancing critical thinking among students with high, average, and low intelligence; to study the relationship between critical thinking and social skills of grade V students; to develop outdoor environmental education program for grade V students in environmental studies. The sample was selected from two schools purposively. The total number of sample was 300 students from two schools. The major findings stated that students taught environmental education by the outdoor environmental education program

exhibited better mean gain scores on critical thinking as compared to students of control group, students with high intelligence exhibited significantly higher mean gain scores on critical thinking than students with low and average intelligence.

Patel (2010) did an experiment on “Development of an Instructional Strategy for Primary School Teachers to Teach Creative and Critical Thinking Skills” .The major objectives of the study were to select appropriate thinking tools for enhancing Creative and critical thinking skills, to develop an instructional strategy using selected combination of thinking skills, to enable teachers to incorporate the creative and critical thinking skills into lesson plans, to study the impact of the instructional strategy in enhancing creative and critical thinking skills in teachers. Major findings of the study were as follows. Sampled teachers improved their fluency, flexibility and originality dimensions of creativity through the instructional strategy. Sample teachers improved their ability to think critically through the instructional strategy. The developed instructional strategy incorporating thinking tools and thinking strategies was effective in enhancing creative and critical thinking.

Deepa (2012) completed an experiment on effect of co-operative learning on critical thinking and problem solving ability in Mathematics among higher secondary students. The main objectives were i) to compare the difference between the pre test and the post test of the co-operative learning approach and ii) to know the traditional method on critical thinking ability and problem solving among the higher secondary students with respect to their achievement level. Pre test-post test research design was used. The stratified random sampling technique was used. 214 class XI students were taken from two Government Aided school of Kanyakumari District. For collecting data, Self constructed tools viz. critical thinking ability test and problem solving ability test in Mathematics were used. Major findings of the study showed that i) the co-operative learning approach was more effective than the traditional method in developing critical thinking ability among the high, the middle and the low achievers, ii) the co-operative learning approach was more effective than the traditional method in developing critical thinking ability and problem solving ability among the higher secondary students.

Caldas (2013) completed an experiment on engaging young learners in the process of English learning through critical thinking writing activities. The main objectives of

the study were to develop critical thinking in writing activities, to design a booklet with writing activities involving critical thinking and both qualitative and quantitative research design was used in the study. The study was conducted on VII grade students and the teachers who implemented critical thinking strategies in their classes. For measuring the students' level of critical thinking an interview session, observation and activity sessions were conducted. The main findings of the study suggested that the teachers who had some experience in applying critical thinking skills in the classroom was very helpful because it confirmed the thinking behind the results from the observations done with the students. The experiments also certify the basic theory of critical thinking skills. It stated that the implementation of these strategies may appear difficult, but often requires only a slight shift of the teacher's approach in his/her curriculum. The research also suggests that when a teacher uses Critical thinking strategies with children, they got more autonomous; their level of motivation began to grow while they were doing the activity. When students were faced with a challenging situation, they had to find answers and while searching for them, they begun to have fun.

Singh (2014) completed an experiment to know the effect of cooperative learning on critical thinking social competence and achievement in social science of secondary school students. The main objectives of the study were i) to study the effect of Jigsaw method of cooperative learning, gender and their interaction on critical thinking skill and ii) to study its dimensions by taking pre-test scores of critical thinking skill, critical thinking dispositions, social competence and achievement in social science as covariate. The study was experimental in nature and it was designed non-equivalent pre test-post test control group design. For item analysis of the test and assessing reliability of the test, three schools from Ludhiana district were randomly selected. One school called Khasi Kalan from these three schools was randomly selected for the experimentation. The sample for testing was 116, out of these, 57 were taken randomly as experimental group and 59 were taken randomly as control group. Measures of central tendency, S.D., Skewness, Kurtosis, correlation and ANCOVA were used for analyzing data. Major findings of the study stated that the gender differences were not found in Critical thinking skill of students taught by Jigsaw method of cooperative learning and students taught with traditional method of teaching; critical thinking skill of students taught by Jigsaw method of cooperative

learning was significantly better than students taught with traditional method of teaching; critical thinking skill was found independent of interaction between gender and group; analogy, interpretation and inferences of students taught by Jigsaw method of cooperative learning was significantly better than students taught with traditional method of teaching; evaluating arguments, logical analysis, recognition of assumption and deduction of students taught by Jigsaw method of cooperative learning and traditional method of teaching do not differ.

2.2.0 IMPLICATIONS FOR THE PRESENT STUDY

From the reviewed studies, researcher found two studies related to Social Science teaching by Narayanswami (1960), Chakroborty (1978) and found that fund allotted for the social studies equipment were very low and discussion in the classroom by using instructional materials were more effective than simple lecture. Many studies have been conducted on Geography and History subject by Jani (1983), Bhattacharya (1984), Chaudhary (1985), Ingole (1985), Raina (1990) and Ibrahim (2007) at secondary level, and these studies revealed that most of the teachers were not well qualified in the specific subjects., narration or lecture method was the most popular method for teaching, teaching aids were rarely used and the use of technology in social sciences courses is very low. A PLM was prepared by Chaudhary (1985) for the students of secondary level and evaluated its effectiveness. Gupta (1983), Sharma (1992) and Lulla, Shah and Darji (1966) conducted critical studies on the social studies syllabus and curriculum. Major findings of these studies were that the syllabus was too heavy, defective, not appropriately integrated with respect to real life situation, social adjustment; no significant problems of present scenario were merged in curriculum etc. Jennifer (2007) studied the effectiveness of the teaching of social studies concepts in traditional ways. Kathy (2000) and Jameela (2010) conducted their studies on building geographic skill and community understanding through constructivist approach and found that the performance and knowledge engrossed by learners taught through constructivist approach are much ahead in overall teaching and learning activities than the student taught by behaviourist approach. Singh (2013) conducted a study on the development and implementation of Multimedia package to teach Geography and found that the developed multimedia package was found to be

significantly effective in terms of enhancing students' achievement in Geography in comparison to the traditional approach.

From the literature on open book examination, studies by Krarup, Naeraa & Olsen (1974), Pauker (1974), Francis (1982), Richard (1985), Feller (1994), Theophilides and Dionysiou (1996), Ioannidou (1997), Loi & Teo (1999), Eilertsen and Valdermo (2000), Theophilides and Koutselini (2000), Brightwell, Daniel and Stewart (2004), Chan & Mui (2004), Loi and Yuan (2005), Vanderburgh (2005), Francis (2006), Phillips (2006), Williams & Wong (2007), Kruger (2008), Petrides et al. (2011), Agarwal & Roediger III (2011), Therriault et al. (2011), Block (2012), Gharib, Phillips & Mathew (2012), Youssef and Ryan (2012), Gharib and Phillips (2013) and Karagiannopoulou & Milienos (2013) were foreign studies and studies conducted by Agarwal et al. (2007), Rajput (2009), Vaghrodi (2009), Chaudhari (2009), Patel (2009), Siddik (2009), Thakar (2009), Vyas and Vyas (2009), Biswal and Das (2011), Gupta (2011), Kumari (2011), Mekala (2011), Ranjan (2011), Unnikrishnan (2011), Sharma (2012), Gamit (2013), Zulfia (2013), Chatterjee (2014), Jalal, Fadhil and Hasini (2014), Biswal (2015), Das (2015) and Maity (2016) were Indian studies. All the foreign studies had been collected from internet. All the Indian studies reviewed were conducted after 2006 till date.

Studies by Pauker (1974), Francis (1982), Richard (1985), Ioannidou (1997), Brightwell, Daniel and Stewart (2004), Loi and Yuan (2005), Agarwal et al. (2007), Patel (2009), Vyas and Vyas (2009), Biswal and Das (2010), Gupta (2011), and Ranjan (2011) Rekha Kumari (2011), Unnikrishnan (2011), Sharma (2012), Zulfia (2013), Chatterjee (2014), Biswal (2015), Das (2015) and Maity (2016) were experimental in nature where the effectiveness of OBE was measured. From these, studies conducted by Francis (1982), Richard (1985), Theophilides and Dionysiou (1996), Loi and Yuan (2005), Agarwal et al. (2007), Patel (2009), Vyas and Vyas (2009), Biswal and Das (2011), Gupta (2011), Ranjan (2011), and Maity (2016) showed that open book examination is better than traditional close book examination with respect to enhancing achievement, creativity (in four studies), higher order thinking (in three studies), decreasing examination anxiety (in three studies) etc., where as the studies conducted by Pauker (1974), Ioannidou (1997), and Brightwell,

Daniel and Stewart (2004) revealed that open book examination is as equal as close book examination in terms of students achievement.

Studies conducted by Theophilides and Dionysiou (1996), Rajput (2008), Vaghrodia (2008), Chaudhari (2009), Thakar (2009), Siddik (2010), Kumari (2011), and Unikrishnan (2011) were based on the opinion or attitude of teachers, parents about OBE. Most of the studies revealed a positive attitude of teachers and parents towards open book examination. Studies by Krarup, Naeraa & Olsen (1974), Richard (1985), Eilertsen and Valdermo (2000), Theophilides and Koutselini (2000), Brightwell, Daniel and Stewart (2004), Agarwal et al. (2007), Williams & Wong (2007), Vyas and Vyas (2009), Biswal and Das (2011), Gupta (2011), Block (2012), Gharib, Phillips & Mathew (2012), Sharma (2012), Youssef and Ryan (2012) and Karagiannopoulou & Milienos (2013), Biswal (2015), Maity (2016) were found comprehensive in nature covering different dimensions of open book examination, whereas, other studies were not so comprehensive.

From the researches reviewed related to critical thinking in classroom teaching learning showed that special programmes and strategies developed by Govatana (1977), Shah (1981), Meghani (1999), Paily (1999), Kaur (2009), Patel (2010), Deepa (2012), Caldas (2013) and Singh (2014) were found to be effective in enhancing critical thinking ability among the students. From the review studies related to divergent thinking showed that special programmes and strategies developed by Lee (2004) and Laila (2006) were found to be effective in enhancing divergent thinking ability among the students. The study conducted by Govatana (1977) shows that socio-economic status has impact on creative thinking scores of both the Indian student and Thai students and Shah (1981) highlighted the importance of having the maximum use of A.V. Aids in the classroom teaching for enhancement of creative thinking. The study conducted by Patel (2010) found that the developed instructional strategy incorporating thinking tools and thinking strategies was effective in enhancing creative and critical thinking of teachers. It also improved their fluency, flexibility and originality dimensions of creativity through the instructional strategy and they also improved their ability to think critically through the instructional strategy.

From the reviewed studies it was revealed that though a good number of research works has been conducted in the area of social science instruction, the researcher has come across only one study related to social science teaching with open book examination. The researcher has come across many reviewed in the area of open book examination and it is clear that only open book test cannot be better without providing proper environment for open book examination and thus it needs open book environment before to test the students through the open book examination. One of the purposes of the present study is to enhance the higher order thinking of the students. From the researches in the area of open book examination, a large number of studies were found on the perception of teachers about the open book examination. The experimental studies on open book examination showed that open book examination is considered only in the context of student's evaluation i.e. a tool for testing product and nobody talks about the open book environment. Hence in the present study open book environment was considered as a tool for process as well as product related to teaching learning of social science. Hence, the present study was an attempt to develop an open book environment for social science instruction and to see its effectiveness.