

CHAPTER II

REVIEW OF RELATED LITERATURE

2.1.0 INTRODUCTION

Review of related literature is one of the significant aspects of research. It enables the researcher to know the volume of work done in the concerned area. It also helps to explore the need of research in unknown and unexplored areas. It is necessary that the researcher is aware of the knowledge generated and the ongoing process of knowledge generation in an area of research. This would lead to better clarity of the problems in that area of research. The review of related literature can help the researcher in this aspect. It also helps to throw insight into the methodological aspects of research in a specific area and issues related to methodological aspects of it. For any researcher, review of related literature forms the basis for the problem identification, helps to find ways and means of studying the problem, methods used in studying the problem, tools used to collect data and the ways of analyzing the data to arrive at a solution. In a nut shell it helps the researcher to arrive at the proper perspective of the study. In the present study the researcher has gone through the review of related literature in the area of study. In the present chapter the researcher has reviewed sixty nine studies and presented in a summarized form.

2.2.0 REVIEW OF RELATED LITERATURE

Keeping in view the objectives and focus of the present study, an attempt is made to review the available literatures and the reviewed studies have been categorized under the following two sections and presented in an abstract form.

- Studies related to value Education and
- Studies related to Science Education

2.2.1 Studies related to Value Education

A total of forty six studies have been reviewed under this section and the reviewed studies have been presented in abstract form as below:

Bahadur (1981) compared values, attitudes and conformity behaviour of adolescents of Kanpur. The study was conducted to examine the developmental trends in values and attitudes of school and college going adolescent students vis-à-vis their rural-urban and sex variations; to analyze the differences among different groups of school and college going adolescents in their values, attitudes, conformity behaviour and beliefs; to examine the variations in their values and attitudes in relation to their socio-economic and family backgrounds, to analyze and identify diffusion of the migrant urban adolescents in terms of their ambivalence in values and attitudes. The stratified sample of the study consisted of 1200 school and college going adolescents of both sexes from 14 to 20 years of age. The tools adopted by the researcher were the Allport- Vernon-Lindzey study of values, Rokeach belief system scale, social attitude scale, reaction to authority inventory and Osgood Semantic differential technique. The major conclusions were: (i) there were some significant age trends in respect of economic values, (ii) the boys and girls differed in political, theoretical, economic, aesthetic, religious, and social values and (iii) the rural urban difference were also observed.

Zamen (1982) studied social, religious and moral values of students of class XI and their relationship with moral character traits and personality adjustment. Findings revealed that there were differences in the values held between urban and rural students, between students of two sexes and between the three communities, viz. Hindu, Muslim and Christian. All the three values had greatest influence on character traits and lowest on personality adjustment. It was found that social and moral values influenced the personality traits much more than religious values, whereas all the character traits (congeniality, helpfulness, kind-heartedness, truthfulness and dutifulness) appeared to be significantly influenced by values. The study suggested that the development and strengthening of health, social, moral and religious value system among students should be a very important function of the secondary schools, which would help in solving problems of student unrest and discipline.

Diwedi (1983) investigated the changing social values and their educational implications. The major objective of this study was to investigate the present status of values of post-graduate students and their guardians and to assess the extent of change in students' values in comparison to those of older generation. The study was conducted on a sample of 400 post-graduate students and 354 guardians in the age group of 40 to 60 years. A social value inventory developed by the researcher was used. Results of the study indicated that place of residence, i.e. rural-urban, had a close relationship with the values, such as religious, ethico-cultural, political, and educational. The other major findings of the study were: (i) sex also played an important role in development of values, (ii) women were more religious, ethical, cultured and keenly interested in societal problems compared to men, (iii) the old values were not shared by the modern youth, (iv) the traditional, caste-wise occupational structure was no longer liked by students, (v) students favoured change in the old curriculum and liked co-education, and opposed traditional system of education and those of ordinary schools were highly significant and in favour of teachers of post-basic schools, and (vi) the post basic schools provided a better atmosphere in schools to inculcate moral, social and religious values as compared to ordinary schools.

Goswami (1983) studied value orientation of post-basic schools in Gujarat. The objectives were: (i) to study the educational moral, social religious, cultural, aesthetic and economic values in post-basic schools of Gujarat and (ii) to study the value orientations of students and teachers of post-basic schools. Three tools, viz. Allport-vernion and Lindzey Value Questionnaire, Value Orientation Questionnaire constructed by the investigator and a scale for Teacher's values (S.P. Kulshreshta) were used. These tools compared the different values among students and teachers of post-basic schools and ordinary secondary schools. The tools were administered to 1,100 students of class X of 80 post-basic schools and 1,100 students of class X of 80 general schools selected at random. The mean, SD, 't' and mean differences were used to analyze the data. Findings revealed that the mean differences of scores on theoretical, social and religious values between teachers of post-basic schools

Bhatnagar (1984) studied some family characteristics as related to secondary school student's activism, values, adjustment and school learning. The major objective of the

investigation was to study the relationship between some family characteristics such as size, socio-economic status, type of family (broken or intact), birth order, student activism and adjustment values. The sample consisted of 540 students studying in class IX. A Student Activism Inventory, SES, Scale (Kappuswami), Test of Values (Agarwal), Hindi Version of Adjustment Inventory (Asthana), and the student's examination records and questionnaires were used. The data were analyzed using Kolmogorov-Smirnov, chi-square and extend median tests. The major findings of the study were: (i) family size affected student activism, adjustment and values, (ii) students belonging to large families had more activist tendencies and poor adjustment, whereas students belonging to small families had less activist tendencies, better adjustment and higher values, (iii) the birth order was found to be related with activism and adjustment along with personal, educational, with activism and adjustment, along with personal, educational, social, and materialistic values; whereas socio-economic status was found to be significantly related with activism, educational, and materialistic values, (iv) the broken family was positively related to activism, poor adjustment, and high personal and materialistic values, whereas the family was positively related to educational and social values.

The study of **Kar (1985)** was about the need of value education in the present time, types of values, their classification. The study also dealt with the concept of value, theory of values, analysis about theories etc. The study concludes that there is often dissatisfaction with education in India and elsewhere, because it lacks the provisions for education in values in general and the moral and spiritual values in particular. That is the reason why many thinkers, educationists, committees and commissions have recommended imparting of education in values, particularly moral and spiritual values, But in spite of the recommendations, value education had remained almost a non-starter in India Lack of proper conviction in value education, and opposition to moral and spiritual education by some people are the major causes of this state of affairs.

Paul (1986) studied value orientations of adolescent boys and girls. The aim was to compare the rural and urban adolescent boys and girls going to schools and colleges with respects to personal, social, instrumental, terminal, and work values. The sample consisted of 1,076 adolescent boys and girls of classes XI and XII and first year of the

degree course in arts, science and commerce groups from Baroda (Vadodara) district. The tools used were Personal Value Scale. Analysis of variance and factor analysis with variance rotation were used to treat the data. The major findings were: (i) differences were found between urban adolescents and rural adolescents, college adolescents and school adolescents, and (ii) the male and female adolescents with respect to different types of values.

Singh & Singh (1986) conducted an experimental study using Value Clarification Strategies (VCS) in comparison with traditional method to teach values to B.Ed. students. The study found that: (i) VCS are more effective than conventional methods for teaching the values of 'dedication to teaching profession', 'cooperation' and 'nationalism', and (ii) VCS are found to be more effective than traditional methods in the inclusion of scientific outlook.

Rathnakumari (1987) studied human values among high school students in Andhra Pradesh in relation to their socio-economic status and mass media exposure. The major objectives of the study were: (i) to identify different human values, and their interrelatedness with a view to incorporating them in teaching programmes, (ii) to develop a convenient toll for measurement of value judgements that are suited to Indian conditions, (iii) to identify specific association of dependent variables like school efficacy and mass media with value orientation. The researcher intended to study human values from a humanistic point of view and ethical value (without religiosity or supernatural content) that are applicable for all human beings irrespective of their religion. The study identified 36 specific human values for excellence in all walks of life and to interrelate with his fellow beings. These values according to the researcher can be suitably built in the academic curriculum of the higher secondary school.

Chauhan (1988) studied the religious and moral education in Shakespeare's drama. One of the findings of the study revealed that history affords moral lessons and historical plays highlight the lapses of reason on morality that leads to catastrophe. It is said that the theory of kingship can be deduced from Shakespeare's plays and definitely there lies a connection with morality, as we understand it on private life.

Chandrasekaran (1989) studied the need gratification and perception of values among the graduate teachers of Periyar district in Tamilnadu. The main objective of the study was to know the extent of value perception and need gratification among the teachers, and how it is affected or influenced by their ego states. The specific objectives of the study were: (i) to study the relationship between the value perception, need gratification and ego states of teachers, (ii) to see whether sex, type of school, educational qualification or experiences (length of service) make any impact on their value perception, need gratification, and ego states, (iii) to identify the dominant dimensions of their values, need gratification, and ego states, and to analyze the relationship and interaction. The main findings of the study were: (i) male and female teachers significantly differed in their value perception, particularly with regard to social, traditional, professional and economic values, (ii) sex was found to be an influencing factor in the need gratification of the teachers, which was higher in male than in female teachers, and (iii) the value perception of teachers working in the government and private schools was found to be significantly different.

Singh (1989) measured the effectiveness of value clarifying strategies in the value orientation of B.Ed. students empirically at the teacher education stage. The study found that there was no significant difference between the adjusted mean scores of value orientation among the control and experimental groups. So the treatment given to the experimental group did not create any significant influence on value orientation of B.Ed. students.

Agarwal (1990) studied the job satisfaction of teachers in relation to some demographic variables and values. A descriptive survey method was employed for the study. Sample consisted of 600 primary and secondary teachers selected from different schools of Agra city. The tools used were, job satisfaction scale developed by Gupta and Srivastava, value test entitled 'study of values' constructed by All port Vernon and adopted by R.P. Bhatnagar, in Indian situation, and a questionnaire developed by the investigator. The major findings of the study were: (i) economic and political values were negatively related to the teachers' job satisfaction, whereas theoretical, aesthetic, social and religious values were positively related to the teachers' job satisfaction, (ii) the teachers with high job satisfaction were found to have high theoretical, aesthetic, social and religious values, (iii) but at the same time

they had only low scores for political and economic values, (iv) though the teachers with low job satisfaction possessed high economic and political values, their other values were at lower level.

Bajpai (1990) experimented an educational intervention curriculum for value development and its facilitative effect upon the level of moral-judgment of children. The main objectives of this study were to develop an intervention programme to facilitate the development of moral judgement of children and to test its efficiency through an experimental study of two groups of children. The sample consisted of 80 children- 40 boys and 40 girls aged 7+ and 8+ enrolled in standard II in three schools in Lucknow and were assigned to two treatment groups i.e. experimental and control. Tools used were two sets of Piaget's stories highlighting particular aspects of moral judgement (pre and post test), draw a man test by Pramila Pattak, SES scale by Kuppuswamy and school adjustment checklist by J. Pant. The major findings of the study were: (i) the intervention programme greatly enhanced children's ability to judge and act as right and wrong and to understand the intention behind the act, (ii) variables like, intelligence, academic achievement, school adjustment and family structure were found significantly related to the concept of moral judgement, whereas, no relation was found with SES, sex and birth order.

Nagar (1990) weighed the reinforcement concept of Skinner with its positive and negative aspects and Kohlberg's moral developmental stages. The study concluded that the prevention of the undesirable and approach of positive guidance are the most effective ways for teaching values.

Das (1991) studied the methods adopted by selected secondary schools in India for development of moral and ethical values and measurement of the value judgment of students of class IX of these schools. The programmes and activities of these eight school aimed at moral judgment were as follows. (1) One period a week was provided in the school for moral education (b) brief talks on moral issues were given in the assembly, (c) yogasanas were taught to students (d) birthdays of religious and social leaders were observed by discussing their life & work (e) teachers observed and recorded the behavior of the students and evaluated their personality in cumulative records. The study found that seven schools out of the group of schools selected and

one out of the seven other schools were found to have a very high mean moral judgment score.

Dubey (1991) conducted a critical study of the concept of value education in India at school level since 1947 to 1986. The study focused on the concept and implementation of value education in India at school level from 1947 to 1986 in order to ascertain the status of value education in Indian education, and highlight its educational implications. Opinions from 404 schools of all denominations selected randomly from Delhi were collected with the help of a questionnaire. Findings revealed that (i) values like national integration, brotherhood, secularism, and punctuality have been highlighted, (ii) songs and legends which highlight socially accepted values are missing from the curriculum, (iii) value crisis is due to lack of ideal leadership, (iv) neglect of affective domain in education, and concept practices in society.

Kulamani (1991) studied the problems of adolescents and their value system. An attempt was made to study the adolescents' problems in the personal, family, socio-emotional, and educational areas as well as their value system. The sample consisted of 240 students from higher secondary schools in Anna District. The translated versions of Yough Problem Inventory (Sandhya Sharma) and New Test for Study of Value System (Gilant) were used. Mean, SD and 't' test was used to treat the data. Findings revealed that (i) adolescent boys and girls had problems in personal, family, socio-emotional, and educational areas, (ii) adolescent students in higher secondary schools were low in political and religious values, but high in social values.

Banui (1992) attempted to find out the personal value pattern and self-concept of Nagaland college students and the relationship between the values. The main objective of the study was to find out if any difference exists in their values and self-concept among arts, science and commerce students and also between male and female students and tribal and non-tribal students. The findings revealed that (i) there were no significant differences in the mean value scores of arts, science and commerce college students in respect of social value, aesthetic value, economic value, knowledge value and hedonistic value and family prestige and health value scores, (ii) the tribal and non-tribal students differed significantly in respect of their mean scores

on religious value, social value, aesthetic and democratic value, (iii) boys and girls differ significantly in respect of their mean scores on social value, aesthetic value, knowledge value, power value and family prestige value, (iv) there was a significant positive correlation between self-concept and social as well as democratic value and a negative relationship between self-concept and power as well as family prestige values; but there was no relationship between self-concept and each of the values-religious value, aesthetic value, economic value, knowledge value, hedonistic value and health value.

Datta (1992) compared value needs, aspirations and adjustments in relation to academic achievements of scheduled caste and other students of secondary schools of Kumaon. The basic objective of the study was to assess the distribution of value pattern and compare the distribution of values among scheduled caste students in relation to aspiration, adjustment, academic achievement, and need pattern with non-scheduled caste students. The study was conducted on the stratified random sample with each group of 100 boys and 100 girls taken from scheduled caste and other castes. Tools used were value test by R. K. Ojha, educational aspiration scale by V.P. Sharma and Anuradha Gupta, and Adjustment Inventory of school students by A.K. P. Sinha by Ram Rishi Tripathi. The findings revealed that (i) low achiever different values, but low achiever scheduled caste girls were higher on theoretical, economic, and aesthetic values compared to low-achiever non-scheduled caste girls, (ii) however, the low achiever non-scheduled caste girls were higher in religious value, (iii) higher achiever scheduled caste boys had higher political value than higher-achiever non-scheduled caste boys.

Padmanaban (1992) attempted to assess the value pattern of high school pupils and offer suggestions for the improvement of values in the schools in the light of these findings. Samples of 1,000 pupils studying in IX class in South Arcot district were selected. The student Value Inventory, Student's Occupational Preference Inventory and self-concept Inventory were used. Mean, SD, 't' test, chi-square and inter-correlation were used to treat the data. Results of the study indicated that (i) the highest score was obtained on social values and the lowest on political values, (ii) boys and girls differed in respect to theoretical, economic, political, social, and

aesthetic values, (iii) there was an association between the pupil's most preferred value, and their caste and religious, socio-economic status, and self-concept.

Arora (1993) studied the relationship between the nature of scientific knowledge and values among university teachers and students. The objectives of the study were: (i) to construct and standardize the tools on understanding of the nature of scientific knowledge and values, (ii) to study the understanding of the nature of scientific knowledge among university teachers and students, (iii) to study values among university teachers and students; and to study the relationship between the nature of scientific knowledge and values among university teachers and students. The descriptive survey method was used. The sample consisted of 142 university teachers and 461 university students of Varanasi city. Respondents were selected by using the random sampling technique. The tools developed by the researcher and used in this study were Value Reflecting Questionnaire (VRQ) and Scientific Thinking Style Questionnaire (STSQ). The conclusion that emerged from the study was that values do affect the understanding of the nature of scientific knowledge.

Dhand et al. (1993) compared the effects of the implementation of the value discussion model in terms of value clarification and dimensions on Canadian and Indian under graduate students. The experimental group was treated through the value discussion model and the other two control groups followed their routine activities. The Value Clarification Scale (VCS) was used to collect the data. The data was analyzed through ANOVA followed by the t-test. The Value Discussion Model group was found to be superior to the control groups.

The study of **Devi (1994)** highlighted Gandhiji's views on social, economic, and political matters. The study described Gandhiji's perception on the concept of democracy, views on freedom, rights and equality, and the home based values, rural economy based on the Panchayat system, Gandhiji's belief that democracy would help the country in becoming prosperous and Gandhiji's views on democracy.

Sharma (1994) measured effectiveness of value analysis model in developing value analysis competencies among B.Ed. trainees and school students. The study was conducted to see and compare the effectiveness of value analysis model (VAM) in developing value-analysis competencies (VAC) among B.Ed. trainees and school

students when taught with or without the use of value-analysis model. The major values taken up are co-operation, dedication to teaching profession, nationalism, perseverance, and scientific temper. An experimental design using pre-test and post-test with parallel groups has been used. The detailed description about various approaches strategies, and models of value-based education has been provided. The significance of value-based education and the role of teacher have been highlighted. The finding of the study indicated that the effectiveness of VAM over conventional method of teaching in developing VAC among the members of the both treatment groups, over control group under observation.

Diwakar (1995) studied the effect of some intervening strategies on the development of contemporary values among teacher trainees. The study was conducted to find out the effect of different strategies on the development of values, mainly secularism, democracy, national integration, and non-violence among prospective teachers. A scale to measure value orientation was developed. A pre-test-post-test design was used. A sample of 300 teacher-trainees was taken up. The study revealed that the intervening strategies can promote the value of democracy and are useful in developing the value of national integration. It was also found that the value of democracy and national integration developed during experiment is retained over a longer period. The study suggested that values like democracy, national integration, secularism, and non-violence and related to promotion of social cohesion and national unity and for ensuring a reasonable quality of life for all in the context of value crisis.

Kapoor (1995) experimented the value change in secondary school students. The main objective of the study was to determine whether value change could be brought about through an intervention programme on secondary school students. The study also studied whether value change is stable over a period of time, and there exists any differential effects of sex on value change in the students. Using an experimental intervention programme based on Rokeach's methods of the study, the investigator used the pre-post and delayed post method with control type of research design. The four target values considered in the study were self-respect, freedom, wisdom, and a sense of accomplishment. Students aged 14+ and 16+ from 9th and 10th grades in equal member of boys and girls from the schools of Lucknow city were taken as sample of the study. The result of the study revealed that (i) the modified Rokeach's

value change instrument used in the experimental intervention programme was effective in bringing about desired value change among the students, (ii) the experimental subjects showed significant change in self-respect, wisdom, and a sense of accomplishment, (iii) the value-change programme was more effective for girls as compared to that for boys, and (iv) there was significant change in favour of girls for the values, self-respect and a sense of accomplishment.

Ushasri (1995) gives details of a series of studies taken up by her in teaching value education to B.Ed. trainees. The activities included are: trainees perceiving their value system; their self concept in relation to their values; trainees identifying the values that would be included through various co-curricular activities; participation in seminars; analysis of subject text-books to identify the values depicted through the lessons etc.

Patra (1995) studied three social values among certain selected strata of youths of Arunachal Pradesh and West Bengal and prediction of good citizenship amongst Arunachal Pradesh youth with the help of the values. Fixed affect model” was used to inquire into the influence of some selected factors in this study, the “on acquisition of social values, i.e. secularism, democracy, and nationalism for a comparative study of students of X, XI and XII between the states of Andhra Pradesh and West Bengal. With the help of value test and an inventory for good citizenship, the influence of three variables, i.e. education, sex, and heredity, on the acquisition of values was determined. The scores of the subjects were analyzed separately for each value of secularism, democracy, and nationalism. With the help of statistical techniques, the differences among the classes of two states were determined in three above mentioned values. The major findings of the study were: (i) secularism and nationalism attain the peak at class XI and democracy at XII but no significant difference was found in these three values among the students belonging to the class XI and XII, (ii) difference existed between students of classes X and XII, and (iii) students of West Bengal showed higher scores in secularism and democracy, whereas the students of Andhra Pradesh showed higher scores in nationalism.

Datta (1996) conducted an interrelational study between fundamental and social values of the pupils of different educational grades and socio- economic status. The influence of different factors such as educational grades, socio-economic status, and

sex on the acquisition of fundamental values (honesty, co-operation, dutifulness discipline, and sacrifice) and social values (secularism, democracy, nationalism, and socialism) were analyzed. An enquiry was made to find out common factors between these two different types of values among 24 Parganas and nadia districts. With the help of value test and fundamental and social values was measured and significant differences were observed in the attainment of values among different grades.

Agnes (1997) studied the personality characteristics of B.Ed. students in college of education in Tamil Nadu. The sample of 1050 B.Ed. students was randomly selected from the colleges of education in Tamil Nadu. The findings revealed that (i) most of the B.Ed. students fall within the moderate level of the personality characteristics such as, achievement, deference, order, exhibition, autonomy, affiliation, interception, succourance, dominance, abasement, nurturance, change, endurance, heterosexuality and aggression, (ii) the personality characteristics have a partial impact on the personal values like, adaptability, cooperation and tolerance, and (iii) the personality characteristics very much contribute towards development of values in the students.

Joshi (1998) studied development of democratic values through value analysis technique in civics at secondary stage with the objectives to study the effectiveness of value-analysis technique in terms of developing democratic values among students through teaching of civics, and trends in development of democratic values on different scores of different groups. The researcher used 21 null hypotheses, keeping in view the objectives of the study. The study followed experimental approach and time series design for the development of democratic values. The value analysis technique was found to be effective in terms of developing democratic value among students, through teaching of civics.

Sinh (1998) studied aesthetic values of school students. The objectives of the study were: (i) to study the relationship between aesthetic sensitivity and aesthetic reasoning of the school children, (ii) to construct and validate a scale to measure the aesthetic reasoning of the students for various stimuli and (iii) to study the interrelation between aesthetic sensitivity and reasoning in relation to the students' personality, gender and areas to which they belong. 539 students (240 boys and 299 girls) of class IX from urban and rural areas of V. V. Nagar, Gujarat were selected randomly by using stratified sampling technique. Data were collected through the

Aesthetic Sensitivity Scale, Aesthetic Reasoning Scale, Passi's Test of creativity and Modisley's Personality Inventory and analyzed by using the correlation, 2*2 factorial design, ANOVA and t-test techniques. The major findings of the study were: (i) there has been found a significant positive correlation between aesthetic sensitivity and aesthetic reasoning for stimuli, trees, birds and animals, children and men, (ii) there was found no significant relationship between aesthetic sensitivity and creativity (flexibility) for any of the seven stimuli, and (iii) the urban groups showed a higher sensitivity for trees as compared to rural groups and the girls showed higher sensitivity for the stimulus men as compared to boys.

Skinner (1999) conducted a study entitled Teaching through Traditions: Incorporating Languages and Culture into Curricula. This study discussed the challenges to the perpetuation of American Indian Languages and Cultures, as well as successful strategies and practices for developing culturally relevant curriculum. Seven values common to traditional Native Education were identified that could form the basis of a tribal code of education or curriculum and recommendations were offered to move public schools towards equality and equity.

Islam (2002) studied value pattern of college students in relation to some selected socio-educational variables. The major objectives of the study were: (i) to examine the influence of sex, religion, language and local differences on the values of college students, (ii) to compare the values of college students having varying courses of studies, that is Art, Science and Commerce, (iii) to examine the influence of some selected socio-educational variables on the values of college students, (iv) to analyze the values of college students. 610 students from eight deficit colleges of Gauhati were selected for the study. Value Orientation Scale, Questionnaire, SES Index, Index for Media Exposure and Index for Library Use tools were used for the study. Descriptive statistics such as mean, SD and percentage were used to analyze the data. The comparison of the sub-groups was done by applying t-test and chi-square. The major finding of the study was, the differences were found in the value patterns of the college students in terms of gender, religion, mother tongue, locale, stream, SES, period of study in the college, media exposure and library use.

Pathan (2002) compared values among students of colleges of Education of Bombay and Aurangabad cities. 600 students were selected randomly from the colleges of

education located in Aurangabad and Bombay cities. Questionnaire by Agrawal was used as a tool to collect the data. The collected data were analyzed through critical ratios to study the significance of difference between the mean scores. The major findings of the study were: (i) the B. Ed. students of Aurangabad have been found significantly higher in terms of their mean scores on moral, secular and religious values than the B. Ed. students of Bombay, and (ii) the B. Ed. students of Bombay have been found significantly higher in terms of their mean scores on social and cultural values than the B. Ed. students of Aurangabad.

Joyce (2003) conducted a study on “Values expressed in Caldecott Medal Texts (1938-2002)”. Major findings of the study were: (i) total of 1,592 instrumental values were expressed by 331 characters in the text of the 331 characters, there were 235 humans and 96 non-humans, and (ii) values were not equally distributed across the years, gender, age groups

Sarangapani (2003) explored the nature of the child’s construction of school knowledge and the relationship between schooling and everyday knowledge. The study used the tools of anthropology to reconstruct knowledge about a government school and processes of schooling. The study presents a detailed account of the social context in which the schooling takes place and why schooling is important in the village, the ideology of childhood, activities, discourses in the school and classroom, the construction of pupil and teachers identities, regulation of knowledge in the classroom and different aspects of children’s epistemologies. According to the study, the classroom’s overwhelming emphasis on learning through telling and simple memorization overruns all considerations of empiricism, even the pedagogic utility of experiments. Ultimately, what is learnt in school is linked only to life within the boundaries of the school. It has little to do with the life outside it.

Biswal & Srivastava (2005) conducted a study entitled ‘Designing and implementing co-curricular activities to inculcate social values among B.Ed. students’. Findings of the study stated that: (i) the CCA programme was found to be effective in terms of students *conceptual knowledge* in all the taken social values for the present study and as a whole, as the adjusted mean conceptual knowledge value scores of the experimental group in these values were found significantly greater than those of control group, (ii) the CCA programme was found to be effective in terms of student’s *value perception* in

all the taken social values, (iii) the CCA programme was found to be effective in terms of students reaction towards the major components of CCA like, morning assembly, purely value related activities, special CCA activities, celebration of different days, activities related to community and other aspects of CCA, and (iv) female B.Ed. students have significantly more value perception and conceptual knowledge than their male counterparts in the social values.

Thakkar (2005) studied the values incorporated in the English textbook and reflections of teachers and students of std. XI'. The major findings of the study were: (i) among the 8 values, personal value is the highest occurring value; while environmental value was the least, and (ii) the teachers considered the textbook very important in incorporating values by saying that textbook is having value education in its root.

Biswal (2006) conducted a study entitled 'A Study on the Perception of Gandhian Values among teacher trainees in the M.S. University of Baroda with the objectives of (i) to study the perception of Gandhian values like, truth, non-violence, democracy, sarva dharma sambhava (secularism), equality, self-realisation, purity of ends and means, self-discipline, and cleanliness among teacher trainees at the M.S. University of Baroda, and (ii) to study the relationship of personal and academic variables with the perception of Gandhian values among teacher trainees at the M.S. University of Baroda. The following findings were revealed: (i) high perceptions were found about all the nine taken Gandhian values like, truth, non-violence, democracy, secularism (Sarva Dharma Sambhabham), equality, self realization, purity of ends and means, self discipline, and cleanliness among B.Ed. students, (ii) in terms of degree of perception, the nine Gandhian values were ranked like, Secularism (1), self realization (2), self discipline (3), cleanliness (4), equality (5), truth (6), democracy (7), non-violence (8) and purity of ends and means (9), from high perception to low perception by B.Ed. students, (ii) significant differences were found between the Hindu and non-Hindu B.Ed. students in terms of value perception of Gandhian values like, truth, self-realization, and purity of ends and means. Non-Hindu B.Ed. students were found with significantly higher perception in the Gandhian values like, truth, self realization, and purity of ends and means, in comparison to their Hindu counterparts, (iii) significant differences were found between the English medium and vernacular medium B.Ed. students in terms of value perception of Gandhian value 'cleanliness'

and overall Gandhian value. English medium B.Ed. students were found with significantly higher perception in overall Gandhian value and cleanliness in comparison to their vernacular counterparts, (iv) significant differences were found between the B.Ed. students staying with family and B.Ed. students staying at hostels in terms of value perception of Gandhian values like, equality, purity of ends and means, and cleanliness. B.Ed. students staying with family were found with significantly higher perception in the Gandhian values like, equality, purity of ends and means, and cleanliness in comparison to their counterparts staying at hostel.

Malti (2006) compared values, intelligence and academic achievement of students of UP, CBSE and ICSE Board. Descriptive survey method was employed. 450 students were selected through random-cum-cluster sampling technique from Varanasi city. Personal Value Questionnaire (PVQ) by Sherry & Verma, General Mental Ability Test by Joshi and Achievement Test of Life Science constructed and standardized by the investigator, tools were used for the study. The collected data were analyzed by using mean, SD and t-test technique. The major findings of the study were: (i) the students of UP Board schools have been found to have higher social and knowledge values than the students of CBSE Board schools, (ii) the students of schools of CBSE have been found to have higher aesthetic, economic, hedonistic and power values than the students of UP Board schools, (iii) the students of CBSE schools have been found to have higher hedonistic, power and health values than the students of ICSE Board schools, and (iv) the students of ICSE Board schools have been found to have higher religious, social, democratic, knowledge and family prestige values than the students of UP Board schools.

Gardia (2007) studied some determiners of democratic values among higher secondary students. The objectives of the study were: (i) to explore the status of democratic values among higher secondary students, (ii) to find out the relationship of democratic values with following personal and environmental variables and (iii) to study the variables that are determiners of the democratic values. Field survey method was employed and 620 higher secondary school students were selected through the random cluster sampling method from the CBSE schools and UP Board schools. Data were collected through the developed test. The investigator also used other tools viz. Family Environment Scale (Joshi & Vyas, 1997), School Environment Inventory

(Mishra, 1984), Emotional Adjustment Inventory (Patil, 1995), Occupational Aspiration Scale (Srivastava, 1995), and SES Inventory (Katiath, 1999). The data were analyzed by using multiple correlation and multiple regression technique. The major findings of the study were: (i) the higher secondary school students were moderate in the values of equality, dignity of individual justice and tolerance and they were poor in the value of liberty, (ii) students belonging to higher SES have been found low in the value of dignity of individual, (iii) creative stimulation in the school environment is the determiner of the democratic values – liberty, cooperation and tolerance, and (iv) SES has been found to be a negative determiner for the democratic values - liberty, cooperation and tolerance.

Narad (2007) compared personal values of senior secondary school students in relation to school environment and home environment. The major objectives of the study were: (i) to compare the personal values of senior secondary school students of the Doaba, Majha and Malwa cultural regions of Punjab, (ii) to compare the personal values of senior secondary school students studying in Government and private schools, (iii) to compare the personal values of male and female senior secondary school students, (iv) to study the effect of school environment on the personal values of senior secondary school students and (v) to study the effect of home environment on the personal values of senior secondary school students. Descriptive survey method was employed. 900 senior secondary school students from the randomly selected thirty schools (15 Government and 15 private) from the three regions were selected through the multi-stage random sampling technique. Data were collected through the Personal Value Questionnaire (Sherry & Verma, 1971), School Environment Inventory (Mishra, 1984) and Home Environment Inventory (Misra, 1989) and analyzed by using mean, median, SD, skewness, kurtosis, ANOVA and t-test. The major findings of the study were: (i) the senior secondary school students differed significantly with respect to democratic, aesthetic, economic, family prestige and health values, (ii) the senior secondary school students studying in Government and private schools did not differ significantly with respect to religious, social, democratic, aesthetic, knowledge, power, family prestige and health values but differed significantly with respect to economic and hedonistic values, (iii) the male and female senior secondary school students did not differ significantly with respect to aesthetic, knowledge and family prestige values but differed significantly with

respect to religious, social, democratic, economic, hedonistic, power and health values, (iv) the school environment of senior secondary school students differed significantly with respect to creative stimulation, cognitive encouragement, acceptance, rejection and control dimensions, and (v) the home environment of senior secondary school students differed significantly with respect to control, protectiveness, punishment, conformity, social isolation, reward, deprivation of privileges, nurturance and rejection dimensions.

Dwivedi (2010) studied the degeneration of moral values in higher education, its consequences and remedial measures. The major objectives of the study were: (i) to study the consequences of degeneration of moral values in Indian higher education and (ii) to suggest measures for controlling the degeneration of moral values in Indian higher education. The study identified analytical view of moral values and suggested educational, social, political, economic, familial and other remedial measures.

Fatema (2012) compared the values of Bangladeshi male students in public and private universities. The main objective of the study was to investigate whether the personal value system (theoretical, economical, aesthetic, religious, political and social) differs among the male students of public and private universities in Bangladesh or not. Sample was drawn Purposively 104 male students (52 from public universities and 52 from the private universities) from the different parts of Dhaka city of Bangladesh. Major findings of the study were: (i) there is no significant difference in theoretical, aesthetic and religious values between the male students of public and private universities of Bangladesh, and (ii) there is significant difference in economic, social and political values between the male students of public and private universities of Bangladesh.

2.2.2 Studies related to Science Education

The researcher found twenty three studies in the area of science education and the reviewed studies have been presented below.

Chatterjee (1978) investigated to find out the effect of scientific interest at different levels of potential ability with respect to science and to study the predictive values of interest in science and scientific aptitude in predicting success in higher secondary science. The sample consisted of 115 students of standard IX in three different

schools of Calcutta selected randomly from Bengali medium higher secondary boys schools. The tools used were scientific knowledge, aptitude test and Chatterjee non-language preference record. The major findings of the study were: (i) there was a systematic positive relationship between science interest and probabilities of success in science at different aptitude levels except in the higher aptitude levels, and (ii) the relationship between aptitude in science and probabilities of success in science and achievement in science was positive.

Muddu (1978) studied the effectiveness of the use of motion pictures as aids in teaching of biological sciences as compared to the usual methods. The objectives of the study were: (i) films provide the elements for vicarious visual experiences, and (ii) the use of effective and appropriate films results in more learning in less time and better retention of what is learned. This was an experimental study comprising pre-test/post-test experimental group and control group design. The sample of the study consisted of 60 students of class VIII of the age group 12-14 years. The sample students were assigned to the experimental and control group randomly. The major findings of the study were: (i) there was a significant improvement in the post-test performance of students in both groups over the pre-test, and (ii) the sound pictures helped to a great extent the above average students to comprehend the subject matter in biology.

Deopuria (1984) conducted a study of teaching science through environmental and traditional approach in the schools of M.P. The objectives of the study were: (i) to compare the cognitive achievement of students of classes V, VIII, IX and X towards science taught through the environmental versus the traditional approach, (ii) to compare the environmental awareness and attitude of students when taught by above two methods, and (iii) to compare the attitudes of teachers towards the environmental approach of teaching. The investigator formulated null hypotheses around the dependent variables. The study employed two group design having the environmental approach in experimental group and the traditional approach in control group. Three types of tools were standardized – achievement tests for classes V, VIII, IX and X, attitude scale for class X, and attitude scale for teachers. The major findings of the study were: (i) the environmental approach showed greater cognitive gain in knowledge, understanding and application of science concepts related to environment

at primary, middle and secondary school levels, and (ii) the environmental inventory showed significant positive gains in attitude towards the environment for the entire experimental group of students.

Dighal (1985) conducted a study on improved method of teaching biological sciences in schools of Tripura and West Bengal. The objectives of the study were: (i) to explore how to make life science teaching lively, realistic and interesting to the students, (ii) to attempt scientifically the improvement of the present methods, and (iii) to remove drudgery in the teaching of biological sciences. The design of the study was a survey and it was comparative in nature. The statistics used were graphical representations and product moment correlation. The major findings of the study were: (i) there was a significant difference in the effectiveness of 'self-activity method', 'life science club method' and 'audio-visual method', and (ii) two or three methods when combined formed an improved one on the basis of their similar nature. Combination of methods could be made according to the needs of a teacher.

Rao (1985) carried out an analytical study on classroom teaching of effective science teachers. The central focus of the study was what is going on in the classroom and how it is going on in the name of effective science teaching. Pupils' achievement was taken as selection criteria of effective teachers. The major objectives were: (i) to identify effective science teachers on basis of selected criteria, and (ii) to analyze the teacher behaviour of selected effective science teachers with respect to (a) content processing behaviour, (b) interactive behaviour and (c) competent teaching skill behaviour. Observation schedule was used to gather the required data. The major findings of the study were: (i) the content processing like categorization, application of principles, logical reasoning were employed by few effective teachers; and (ii) only few effective teachers were found using new competent teaching activities.

Menon (1986) carried out a study on a system of science education in the perspective of the processes of scientific inquiry. This study focused on the development of process skills of scientific inquiry among secondary and higher secondary English medium schools. The major objectives of the study were: (i) to study the overall impact of the curriculum system on the development of the process skills of scientific inquiry, and (ii) to examine the instruction and evaluation practices in science in secondary and higher secondary classes in relation to the development of the process

skills of scientific inquiry. Paper-pencil test based on the processes of scientific inquiry was constructed by the researcher and was validated by experts. The major findings of the study were: (i) among the learners in the system under study, the overall proficiency in the process skills represented by overall TOPSI score, steadily increased as they went up the standards from VIII, (ii) sudden development of the process skills was found between standard X and XI, and (iii) by the time the learners reached to standard XI, they seemed to have reached a plateau with regard to their overall proficiency in process skills.

Joyce (1988) experimented on mastery learning in science. The major objectives of the study were: (i) to evolve a strategy for mastery learning in science for standard V students, (ii) to determine the change in academic motivation and study habits of the pupils as a result of mastery learning strategy, and (iii) to determine the relationship between a set of pupils characteristics and their achievement through mastery learning strategy. The major findings of the study were: (i) mastery learning strategy on the achievement of the pupils was found to be effective, and (ii) there was a significant development in study habits and academic motivation of students.

Dash (1994) carried out a study on advance organizer model in relation to its instructional and nurturing effect. The major objectives of the study were: (i) to compare the effects of advance organizer model and traditional method of teaching, and (ii) to study the reaction of students towards teaching through advance organizer model. Tests on concept, assimilation of ideas, interest in inquiry, habits of precise thinking and retention of ideas and information schedule and reaction scale tools were used to collect the data. The major finding was that the advance organizer model was found to be superior to traditional methods of teaching.

Costa (1994) analyzed high school science classrooms focusing on the relationship between meanings of science constructed in classrooms and socio-cultural precepts in the wider society. A double comparison research design comparing honours and regular chemistry classes with in two high schools and also across schools was used. Variables included were students, teachers, subject matter and school culture. Data collection method required 300 hours of observation in 8 science classrooms and 50 interviews with teachers and students. The major findings revealed that (i) as school science was examined as though it were the process and product of a curriculum

reaction between teachers, students and subject matter in particular institutional settings, and (ii) they are local versions of school science that reflect and recreate the cultural values, beliefs and meaning system of school community.

Patel (1997) conducted a study on scientific attitude and its correlates among secondary school students of Baroda. Alongwith the development of the scientific attitude scale to measure scientific attitude, an attempt was made to find relationship of scientific attitude with variables like gender, SES, location of school, achievement in science and general achievement of students. One of the major objectives was to measure scientific attitude of secondary school students of Baroda. The major findings of the study were: (i) the mean scientific attitude of girls was more than boys, (ii) the mean scientific attitude of students of urban areas was more than that of rural areas, and (iii) the mean scientific attitude of students of high SES was more than that of average and poor SES.

Seals (1999) studied on caring and its role in effective life science teaching. The focus of this inquiry was to explore, analyze and describe the reciprocity of caring as it is embedded in and shapes the culture of high school life science classroom. The data collection and analysis was guided by the theoretical underpinnings of phenomenology and heuristics while following a multiple case study design. The case study involved 2 life science teachers. Data collected in the form of field notes, video tapes and documents at each site. Grounded theory generated from the study was analyzed by following a case analysis and cross case analysis approach. It was hoped to expand the extent theory about the ethic of care to better understanding the impact caring has in a variety of teaching and learning situations within the life science classroom.

Umashree (1999) studied science curriculum and its transaction in the secondary schools of Vadodara city of Gujarat. This study endeavors to evaluate science curriculum through seeking the data from classroom observation, questionnaire and interview with secondary school teachers about the appropriateness of curriculum, underlying principles of subject matter, correlation between planned and transacted curriculum and extent of attainment of goals of science curriculum. The major findings of the study were: (i) only 3% of teachers began a lesson through activity, (ii) when the lessons were introduced through activity, the students' response was more in

terms of number and readiness to answer the questions, and (iii) in none of the classes, problem solving method or inquiry based teaching had been done.

Odom (2001) conducted a study on integrating concept mapping and the learning cycle to teach diffusion and osmosis concepts to high school Biology students. The main objective of the study was to explore the effectiveness of concept mapping, the learning cycle, expository instruction, and a combination of concept mapping/learning cycle in promoting conceptual understanding of diffusion and osmosis. Four high school biology classes were taught diffusion and osmosis concepts with the aforementioned treatments. Conceptual understanding was assessed immediately and seven weeks after instruction with the Diffusion and Osmosis Diagnostic Test (DODT). A total of 108 secondary students (grade 10-11) enrolled in four different sections of college preparatory biology were selected. Each of the four sections were randomly assigned to a treatment group (concept mapping-26, learning style-28, expository-27 and concept mapping/learning cycle-27). The same teacher taught each of the four classes. The results of the study indicated the concept mapping/learning cycle and concept mapping treatment groups significantly outperformed the expository treatment group in conceptual understanding of diffusion and osmosis. There was no significant difference among the learning cycle group and other treatments.

Dora & Calendar (2007) studied the subject 'cell' through constructivist approach during science lessons and the teachers' view. The main objective of the study was to apply the subject of cell in the primary school science lessons according to the constructivist approach and obtaining teachers' point of views. The sample comprised of 52 students. The study was carried in 23 schools of Mersin city centre with 53 science teachers and two branches of Davultepe Ataturk Primary School. Out of 52 students 24 were selected in control group and 28 were selected in experimental group. The poll and application method was used in the study. From the study, it was found that there was no meaningful difference in control and experimental groups.

Haver (2007) measured effectiveness of Multisensory Instructional Package (MIP) on the science achievement and attitudes of middle school English learners and English speaking students. 'The clue to u' was administered to determine learning style preferences. The controlled groups were taught traditionally and the experimental

groups were instructed on the same units using MIP. The semantic scale was administered to reveal attitudinal differences. The major findings of the study were: (i) the data subjected to statistical analysis supported use of an MIP rather than a traditional approach for teaching science, (ii) analysis of variance revealed a positive and significant impact on achievement scores, and (iii) students indicated significantly more positive attitudes when instructed with an MIP approach.

Renee (2008) studied an exploration of elementary teachers' beliefs and perceptions about science teaching and learning. The study chronicles a group of teachers working in a large public school division and documents how these teachers interpret and implement reform based science methods after participating in a professional development course on inquiry based science methods administered by the researcher. Inquiry based science teaching and its implementation was discussed as an example of one potential method to address the current call for national education reform to meet the increasing needs of all students to achieve scientific literacy and the roles of teacher in that effort. The conviction in science reform efforts was that all students are able to learn science and consequently must be given the crucial opportunities in the right environment that permits optimum science learning.

Smith & Pecore (2008) studied the students' experience smart board through constructivist values. The major objective of the study was to know how students experience learning from smart board technology by teachers using a converted power point lesson. One veteran biology teacher, one experienced physics teacher and students from both selected teachers' classes were selected as a sample. The major findings of the study were: (i) atleast 80% of the students were actively engaged for the entirety of the lessons, (ii) students indicated their high level of engagement during the lesson was due to the interactive properties of smart board, and (iii) students had higher level understanding of the information and they also identified their conceptualization during the focus group interviews.

Bell et. al. (2010) studied collaborative inquiry learning models, tools and challenges with the objective to review the prominent models of inquiry learning. Comparative literature study method was used in the study. The comparison results in a set of inquiry processes being the basis for cooperation in the scientific network NetCoIL. The findings of the study reveal that the collaborative learning tools and models

possess benefits like, arouse interest, motivation, focus attention, enable progressive questioning, facilitate causal explanation, suggests a learning pathways, enable flexible sharing of learning objects, deepen and extent understanding, unbiased communication, structured and reflective knowledge building, benefits of graphical and structural representation of concepts, and learning gains through predict-observe-compare-explain pattern.

Zuway (2010) studied the effect of a collaborative science intervention on high achieving students' learning anxiety and attitude towards science with the objective to analyze how high achieving adolescents learning anxiety and attitude towards science influenced by a collaborative science intervention. A quasi-experimental design was used. The sample was selected from a junior high school located in Eastern Taiwan. The participants consisted of 37 eighth grade from 21 classrooms of the same school as a comparison groups. The finding of the study were: (i) both quantitative and qualitative findings revealed that experimental group students experienced significant impact as seen through increased attitudes and decreased anxiety of learning science. After the collaborative science intervention, the experimental group students gained a significant amount of curiosity and interest in learning science, (ii) the 20 week engagement into inquiry based science intervention helped the high achieving students' foster positive attitudes to strengthen their cooperation with team members. Moreover, during the final six week period, the open inquiry science encouraged students to work as a scientist, (iii) the opportunities of identifying researchable questions from daily life experiences, discussing and integrating problem solving ideas, and presenting research findings in the classroom and in the science fair gradually helped students understand that learning science is not merely memorizing factual knowledge, instead it require students to apply their scientific knowledge in solving daily life problems, and (iv) this concrete experience is helpful for building positive feelings of learning science.

Lynn & Douglas (2010) investigated what teachers see as creative incidents in elementary science lessons. The main aim of the study was to collect the evidence for: (i) Can teachers generally recognize classroom incidents which offer opportunities for scientific, creative thought? (ii) Does practicing teachers' ability to recognize such incidents depend on the kind of science, favouring description (fact-like information)

over explanation (causes and reasons)? (iii) Is their ability to recognize such incidents greater in one field than in another, favouring field 2 (empirical ways of gathering knowledge) and field 3 (the application of scientific knowledge in practical problem solving)? (iv) Does their ability to recognize such incidents depend on the topic in science? (v) Can the teachers discriminate against non-scientific opportunities for creative thought which might occur in a science lesson? Qualitative survey method was used for the study where in 36 short classroom incidents in three dissimilar science topics were constructed. The sample comprised of 23 primary school teachers of a rural, a small town, and a large town primary schools in the North-East of England with roughly equal numbers of teachers in each school. The major findings of the study were: (i) teachers are often urged to nurture creativity but their conceptions of creativity in special school subjects may have limitations which weaken their attempts to do so, and (ii) some teachers saw creativity in essentially reproductive activities and in what simply stimulated interest and on-task talk.

Gerstner & Bogner (2010) studied cognitive achievement and motivation in hands on and teacher centered science classes with the question does an additional hands on consolidation phase (concept mapping) optimize cognitive learning at work stations? The study monitored the cognitive and motivational effects within different educational instruction schemes: teacher-centered versus hands-on instruction and hands-on instruction with and without a knowledge consolidation phase (concept mapping). The sample comprised a total of 397 high achieving fifth graders participated in the study. Pre-test, post-test, retention test design both to detect students' short term learning success and long-term learning success, and to document their decrease rates of newly acquired knowledge was used. The study revealed that, (i) to sustain the higher increase in knowledge caused by concept mapping method should be applied regularly, before instruction takes place to improve for term knowledge acquisition, (ii) fifth grade students had a high level of interest in hands-on instruction, and (iii) although they were confronted as novices with an activity-based learning environment, they reported higher level of tension during instruction, focus attention, enable progressive questioning, facilitate causal explanation, suggests a learning pathways, enable flexible sharing of learning objects, deepen and extend understanding, unbiased communication, structured and reflective knowledge

building, benefits of graphical and structural representation of concepts, learning gains through predict-observe-compare-explain pattern.

Amin (2011) carried out a study on the development and implementation of an activity based science teaching programme for pre-service student teachers. The study also focused the effectiveness of the programme in terms of the difference found in student teachers' disciplinary knowledge, understanding of science, teaching experimental ability and attitude for science teaching. Some of the major objectives of the study were: (i) to study the effectiveness of the developed programme in terms of the differences in student teachers with respect to content knowledge of science and technology, experimental ability, understanding about nature of science, teaching qualities enhanced as science teachers, understanding about science teaching, and (ii) to study the effectiveness of the developed programme in terms of student teachers' opinion about each of the activities after their implementation, student teachers' responses at the end of the programme. The major findings of the study were: (i) the developed activity bases science teaching programme was found to be effective in terms of achievement of student teachers', experimental skills of student teachers' and their quality, (ii) there was enhancement of their understanding, content clarity, awareness, knowledge gained, attitude development, innovative thinking, decision making and planning ability, and (iii) the developed programme also improved their science process skills.

Raval (2012) examined effectiveness of constructivist approach to the teaching of animal classification in science and technology of standard nine. The objectives of the study were: (i) to develop constructivist instructional program for teaching of animal classification in science and technology of standard nine, (ii) to implement constructivist instructional program for teaching animal classification in science and technology of standard ninth, and (iii) to compare the effectiveness of constructivist instructional program and traditional instructional program for teaching of animal classification in science and technology of standard ninth on the basis of post achievement score, and (iv) to get feedback from students on constructivist instructional program for teaching animal classification in science and technology of standard ninth. Experimental design was used sample was selected purposively. The major findings of the study were: (i) the effectiveness of the Constructivist

Instructional Program (CIP) was found considerable on entire sample as compared to traditional approach, and (ii) as compared to traditional approach the effectiveness of the CIP was found considerable on boys and girls as compared to traditional approach.

2.3.0 IMPLICATIONS OF REVIEWED STUDIES FOR THE PRESENT STUDY

From the reviewed of the studies it was observed that the review brings out significant quantum of the literatures available and also reveals significant gaps in building up an autonomous body of cumulative knowledge which future researches could focus on. Attention has been focused on different areas of value education like value patterns, attitudes towards value education and value learning processes. Zamen (1982) did a study on correlates of some values, Chauhan (1988) imparted moral education through literature, Das (1991) used direct method for value inculcation in schools, Diwakar (1995) inculcated social values among teacher trainees through intervening strategies, Kapur (1995) did the effect of value change programme on secondary school students, Skinner (1999) did value teaching through traditions among the tribal of USA, Biswal and Srivastava (2005) developed social values among B.Ed. students through co-curricular activities, Thakkar (2005) integrated values among higher secondary students through language teaching and Biswal (2006) found the correlates of Gandhian values. From these studies it is very clear that value can be taught to the students by some approaches. No study was observed related to direct integrated approach of value inculcation in any science subject. Hence the proposed study is an attempt to bridge the gap felt in the area of value education through integrated approach.

A marked decline of interest in value education has been portrayed as out of the total 48 reviewed studies, only 12 studies have been reported after the year 2000 while 22 studies were conducted in 90th decade. This fact also supports the finding of 6th survey report that out of 78 reported studies, only 18 studies were conducted during the latter half period (1997-2001) of the 6th survey of research in education. The review of research reveals significant gaps in on the uncovered areas which could focus on. It was also observed that majority of the studies were of survey types and developmental type and studies were conducted with different types of objectives and

focus. Survey type studies were conducted with a view to study the relationship between various values and different variables like, family background, age, sex, locale (Bajpai, 1997), caste etc. For a discipline like value education, one can expect to focus on identification of some methods and techniques for value inculcation. Some experimental studies were employed method of Rokeach (Kapoor, 1995), different intervention strategies as well as models on development and status of changing values among students. Majority of the studies have been conducted on the primary school level. Some studies also covered on the high school students, undergraduate and post-graduate students, school/university and trainee teachers. One study included Scheduled Caste students also. However it was observed that a larger number of studies were confined to the school level and a few studies were conducted on B.Ed trainees.

Studies conducted by Singh and Singh (1986) and Dhand et al. (1993) found the tools of value inculcation like, value clarification strategies and value clarification model are more effective in value development in comparison to traditional methods, whereas Singh's (1989) study stated that value clarifying strategies was not found superior than traditional method in the value orientation of B.Ed. students. The studies by Chauhan (1988) and Nagar (1990) found alternative strategies like teaching of English poem (Shakespeare's drama) and the prevention of the undesirable and approach of positive guidance are the most effective ways for teaching values. Studies by Bajpai (1991) and Das (1991) were found on the development of values among school students. Study by Banui (1992) revealed that the development of religious, social, aesthetic and democratic values have a relation with sex, denomination (tribal/non-tribal) and no relation with the stream of education. Ushasri's (1995) study provided detailed co-curricular activities for teaching of value education to B.Ed. trainees. Study conducted by Biswal & Srivastava (2006) emphasized that CCA can help in developing social values. Available related literature reveals the impact of some strategy on the development of values among different groups of students and very few studies has been conducted on value integration during classroom transaction. The review of related literature indicated that the post basic schools provided a better atmosphere in schools to inculcate values as compared to ordinary schools and there is difference between urban students and rural students, college students and school students, and male and female students with respect to different

types of values (Dwivedi, 1983 and Paul, 1986). Hence the present study is an attempt in the direction towards the value integration during the classroom transaction.

Science education programmes will be designed to enable the learner to acquire problem solving and decision making skills and to discover the relationship of science with health, agriculture, industry and other aspects of daily life (NPE, 1986). The review of the studies on science education has focused different areas of science teaching-learning. Many researchers have measured effectiveness of method, approaches, programmes or package in comparison with traditional teaching of science like an activity based science teaching programme (Amin, 2011), advance organizer (Dash, 1994), mastery learning strategy (Joyce, 1988) and multisensory instructional package (Haver, 2007). Some of the researchers also tried to study the different methods in science teaching (Rao, 1985 and Umashree, 1999), scientific attitude (Patel, 1997) and perceptions and beliefs of teachers on science inquiry (Renee, 2008). It was observed that the studies done by Muddu (1978), Deopuria (1984), Dighal (1985) related to use of various approaches for teaching sciences were found effective with regard to attitude and more retention of the concepts. The studies by Costa (1994) and Seals (1999) with regard to relating teaching of sciences to society were also found effective. Thus it can be said that when the students were taught science with different approaches apart from traditional methods they were found effective.

The review indicates that the teaching of science becomes more effective if constructivist approach, some developed packages, programmes or activities are used than the traditional method. Majority of the past researchers have developed and measured effectiveness of some of the developed package, approaches, programmes or activity in teaching science, however, none of the researchers had tried to measure the effectiveness of integrated approach in teaching science.

The review of the related literature has enabled the researcher to formulate the relevant hypotheses for the present study. Science curriculum promotes rational analysis, inductive and deductive reasoning, problem solving and decision making ability, and it also functions with the assumption that introducing children to the scientific skills and knowledge can instill rational thinking, reasoning ability and confidence in them, which will inspire an individual to challenge the existing beliefs,

prejudices and practices of the social world. The classroom's overwhelming emphasis on learning through telling and simple memorization overruns all considerations of empiricism, even the pedagogic utility of experiments. Ultimately, what is learnt in school is linked only to life within the boundaries of the school. It has little to do with the life outside it which is in accordance with the curriculum and policy documents development of scientific temper is crucial to the learning of science in schools (NCERT, 2012). Hence the present study was undertaken which helped the research in developing a better understanding of students' learning in science, developing ways of organizing the content of school science for more effective learning, integrating research and classroom practice, developing an understanding about values associated with school science and developing strategies for value practices through science education.

Thus the review of the related literature reveals that researches were conducted at different levels of education however, not much work has been conducted at secondary school level for value inculcation. Also the science subject has been neglected from the value inculcation. The reviewed studies also reveal that the very few studies have been conducted on integrated approach of value education. The investigator found a gap in terms of unavailability of sufficient research in the area of value education among the secondary science students through integrated approach. Therefore the investigator wished to conduct a study on value education through integrated approach in teaching science to secondary school students.