Chapter II

Review of Related Literature

2.0 Introduction

Every research follows a systematic process. This process includes various steps such as identifying the problem, preliminary research, methodology. In other words, it could be said that these steps form the guiding principles for the researcher to complete the study systematically. Review of Related Literature is one of the most critical steps of the whole process, which provides a clear picture of preceding work accomplished by other investigators on the similar or allied research domain, avoiding repetitions. A short and brief account of previous research and future perspectives related to the topic or a problem could be a definition for reviewing related literature. Meticulously reviewing the literature related to the problem helps the researcher to understand the problem conscientiously. Scanning previous related work assists and directs the researcher for further scope in the concerned field. In a similar line, Boote & Beile in 2005 remarked that research is not possible without an in-depth understanding of the literature related to the concerned area.

According to Koul (2009), "Reviewed literature gives a thorough and clear understanding of the methodology implemented in earlier research". It helps the researcher know about the tools and instruments that proved valuable and promising in previous studies. The advantage of the related literature is also to provide insight into statistical methods through which validity of results is to be established. The conclusive and specific reason for reviewing the related literature is to know about the recommendations of the previous researcher for further research which they have listed in their studies."

Onwuegbuzie et al. (2016) further highlighted a few utility points for reviewing and then accounting quality literature before any research, such as: differentiating between the issues researched and still needs to be explored further, try to identify only flawless and commendable research, highlighting essential variables related to the topic, unintended duplications of literature needs to be avoided, focus o research methodology and design of the reviewed study, work on understanding the relationship between theory, and practice in the reviewing research, recognize the inconsistencies, positive and negatives or any contradictory statements, and weaknesses of the various research approaches that have been utilized.

Thus, the review of related literature signifies its importance in any research by familiarizing the researcher with the results and knowledge of past work and highlighting the future scope and guiding the present work.

2.1 Purpose of Review of Literature

The original purpose of the review is to get in-depth knowledge and understanding of the problem in all the possible perspectives through existing research and views of scholars around the world. It helps to gain a deeper understanding of the tools and techniques used by other researchers and methods of previous studies. It also prepares the ground to support the present research findings and create implications for future studies when presented as a thesis written report (chapter). It also gives a chance to the reader to appreciate the evidence that has already been collected by previous research. It thus projects the current research work in the proper perspective."

A constructive and presentable review should be categorized systematically and in an organized manner while narrating in the present work. The categorization of the reviewed literature should be understandable and highlight the required fields of the present study and focus on shortcomings of past work and expected perspectives for future work.

2.1.1 Categorization of reviewed Literature

Literature reviewed for the present study was categorized under the following categories:

1. Studies on Life Skills Education for Behavior Development
2. Studies on Life skill Education for Social and Emotional Development
3. Studies on Life skills Education through the Formal Education System
4. Studies on Life skill Education through different Subjects
5. Studies on Teaching-Learning of Science and Technology

2.2.1 Studies on Life Skills Education for Behavior Development

Botvin & William (1980) studied the effect of life skill training to prevent cigarette smoking. Ten sessions of socio-psychological approach for the prevention of cigarette smoking were taken in the eighth, ninth, and tenth-grade students in suburban New York. The sample for the studies was 281. The intervention program includes social as well psychological factors which promote cigarette smoking. The factors include:

1. Increasing students' ability to cope with direct pressures to smoke.
2. They were decreasing their susceptibility to indirect pro-smoking social influences.
3. It is improving students' ability to cope with anxiety.

The sessions were taken care of by experts and Health professionals. A significant difference between the experimental and control groups was marked, such as transformation in students (who were given treatment) in terms of knowledge related to cigarette smoking aftereffects, decrease in smoking behavior and students' psychological balance.

Roylew (1983) conducted a study on the African American and White children from kindergarten to 5th grade, and the effect of racial and gender gap on academic achievement was studied. The study determined how social and behavioral factors such as social skills, problem-solving skills, and interpersonal skills affect gender gaps and racism. The study also aims to understand the academic difficulties aroused due to these gaps. The Early Childhood Longitudinal Study-Kindergarten Cohort (ECLS-K) sample and growth curve modelling were the tools for data collection. The study's findings revealed that if behavior problems and social risk factors were focused on, they could be quickly addressed through life skills in the classroom.

Elias et al. (1991) examined the effectiveness of life skills programs on elementary school students. The study was longitudinal with six long years. The research results revealed that all the levels of pro-social behavior in children not inversely related to self-destructive behavior and life skill intervention helped students with social adjustment and reduced the risk of future delinquent behavior and improvement in their academic achievements.

Caplan et al. (1992) carried out a study to know the effectiveness of Life Skills-based intervention programs on social adjustment and alcohol use among inner-city and suburban young adolescents. The study was experimental where two groups: experimental and control group were considered for the study. Adolescents from experimental group were treated with experiential learning through life skill based intervention and control group was given only information related to social adjustment and alcohol use. They found that the experimental group who got Life Skills-based intervention programs improved in their impulsiveness control.

Meyer & Steyn (1992) studied the effect of life skill training in the awareness program on Acquired Immune Deficiency Syndrome (AIDS), sexually transmitted diseases (STDs), Human Immunodeficiency Virus (HIV). The study was conducted in twelve Pretoria, Laudium, Cape Town, and Soweto (South Africa). The survey aimed at an awareness program on AIDS prevention behavior and tolerance towards infected people. Pre-post questionnaires and group interviews were used as data collection tools. The

program includes ten modules, and each module has specific learning objectives focusing on teaching methods, teaching aids, learning activities, and some suggested reading material. Each module report mentioned different issues such as puberty and adolescence, family and peer relationships, sexuality, HIV, and AIDS. The results indicated that there was overall development in knowledge related to HIV and AIDS. Furthermore, awareness regarding condom use, susceptibility, the seriousness of HIV and AIDS, and peer pressure in sexual activities were improved among students participating in the program.

Botvin et al. (1995) studied the effectiveness of culturally focused and generic skills training on minority adolescents regarding alcohol and drug abuse. The sample was selected randomly. The sample consisted, 456 seventh-grade inner-city minority students from six New York City Public Schools. A two-year follow-up program was conducted with three different sample groups. One group received a generic skills training prevention approach; the second group was treated with a culturally focused prevention approach. The last group considered as control group, received only alcohol and drug abuse prevention information. The effectiveness was studied, and it concluded that both the prevention techniques positively affected their alcohol consumption behavior. The amount of alcohol per drinking and intentions to drink alcohol was decreased compared to the control group who received only information, not any training. Experimental groups improved positive attitudinal behavior related to drug and alcohol use. The experimental group concluded that it improved refusal assertiveness, low intention to drink, and decreased risk-taking towards drugs and alcohol.

Misner (1995) conducted an experimental study to analyze the influence of social skill training on students. The study results indicated significant improvement in the total behavior problems among students of the treatment group. It was also reported by parents and teachers of the experimental group that the behavior problems in the children were quickly undertaken after the program.

A report by **Lobner (1997)** on one of the International Labor Organization (ILO) training programs on skills and entrepreneurship training highlighted the importance of life skill training on working class. The training was given to the working-class people in countries emerging from armed conflict during 1996-97. The report provided an analysis of various programs in the area of Life Skills in South Africa. Furthermore, it was reported that the importance of life skills among other programs and demonstrated that Life Skills increased efficiency and quality of work.

Magee (1999) in a study entitled "the peace leaders: a descriptive study of the Life Skills gained through resolution training", concluded that the students who had completed training in the Citizenship and Law-Related Conflict Resolution Program had Life Skills of communication, problem-solving, and mediation in real-life situations. All the students reported that the conflict resolution training had a significant impact on real-life situations—developing communication skills involved in active listening, self-expression, and growing as a public speaker. The attaining of Life Skills had a positive impact on their abilities of decision making, problem-solving, and conflict management with others.

Weitlauf et al. (2000) studied the effect of life skills training on women's self-efficiency, Assertiveness, and aggression. The result showed that such training helped in the development of Assertiveness and self-efficacy among women. It was also revealed in findings that there was a noticeable drop in the levels of aggression on hostility among women after the intervention. This may be due to the improvement in interpersonal relationships.

Weichold et al. (2002) studied the effectiveness of a life skills program on adolescents concerning alcohol consumption and school bonding. A life skill program was implemented on adolescent boys and girls for three consecutive years, and effectiveness was recorded accordingly. The focal area of the program was to understand the role of gender, and it was assumed that the program might have a more positive effect on the specific needs of the girls when compared to boys and have moderating effect on girls. The study suggested that moderating effect concerning gender was not much significant. Further, the results also conclude that girls developed more communication skills and self-confidence than boys after the intervention.

Botvin et al. (2003) have many studies on life skill education in their list; one study conducted was on tobacco and alcohol prevention among elementary school students with the help of Life Skills Training. In this study, they focused on educating students with social resistance skills and the skill of social competencies. The program's effectiveness in terms of avoidance of tobacco and alcohol use among students of elementary school was studied. The sample for the study includes 1090 elementary school students from 20 schools. The selected model was randomly assigned to the control and experimental group. Nine schools with 426 students and eleven schools (664 students) formed the experimental and control groups. The dependent variables for the study include the rate of substance abuse, behavior, and attitudes towards alcohol and

tobacco and related issues, and independent variables were gender, race, and family structure at the individual level. Data were collected and analyzed at individual and school levels. The results at the personal level showed that after the intervention of the program, there was a reduction in smoking, normative expectations for smoking and alcohol use, along with an increase in anti-drinking attitude and self-esteem. Data was also analyzed at the school level, and it was found that there was a 61% and 25% decrease in the annual prevalence rate for smoking and alcohol, respectively, compared to the control group students. Furthermore, it was also noticed that there was an upsurge in self-esteem among students who were treated with the intervention program. Overall findings revealed that the school-based substance abuse prevention approach, which was used in middle school to prevent alcohol and drug abuse, was also similar to elementary students.

Padmanabhan et al. (2003) carried out a project on adolescent life skills development in Azinagar and Kanakamamidi villages in Andhra Pradesh. Out-of-school children from two different rural areas of Andhra Pradesh were taken as target group. Adolescents were taught with life skills and its importance while facing difficulties of life. Data were collected to study the effectiveness of the intervention. The result revealed that life skills development intervention conducted among out-of-school adolescents improved their self-confidence, Assertiveness, and communication skills.

Zollinger et al. (2003) evaluated a school-based life skill training, which was conducted from 1997 to 2000, for tobacco prevention and control on middle school students of Marion Country, Ind., The impact of the program on the knowledge, attitude, and decision-making skills on middle school students was studied. The sample of the program comprised of students studying in grades six to eight. A survey was carried out to evaluate and compare the collected data related to tobacco use behavior and attitudes towards tobacco use and knowledge related to substance abuse of the trained group with the students of the control group. 12.5% of students of the surveyed group were found smoking before the intervention. It was concluded in the study that after the training program, there was a significant fall in the number of smokers, and students who didn't smoke would like to stay smoke-free. Peer refusal was one of the most important outcomes of the training program, as participating students remarked that even though they hung up with friends who smoke, they developed a habit of saying no to them, as they were now aware of the ill health effects of smoking. The researchers concerning gender and race also noticed a significant difference.

Davis (2004) analyzed the impact of the Life Skills training program on the behavioral and cognitive factors of the psychological wellbeing of Black and White college students. The sample group includes 376 college students. Each participant received the Life Skills training for twenty sessions in a month and completed the college Self-Expression Scale. Tools used for the study encompassed Self-perception Profile and College Adjustment Scale. Both the devices different domains for analysis, as in Self-perception "profile Scholastic Competence, Physical Appearance, Social Acceptance, and Global Self-worth" and in College Adjustment Scales, anxiety and depression for college students were taken care of. Cultural differences concerning Assertiveness and self-concepts in both groups were found with a significant difference. On the scale of Assertiveness, black students were found more assertive than white, leading to a higher amount of anxiety and depression. The findings also revealed that social acceptance among Black college students was an issue but didn't have any association with anxiety and depression. Overall results proved a significant improvement in students' self-concept, depression, and anxiety levels after the training program.

Smith (2004) validated the significant effect of life skills training on young people concerning alcohol and drug use. Smith conducted a training program on life skill education and highlighted the relationship in-between all the life skills. He further argued that with the development of coping skills, the improvement in interpersonal relationships could also be noticed, which results in a decrease in aggression and other behavioral issues. The study suggested that life skill training had a noticeable effect on problem-solving skills, social and emotional skills, and the development of management and leadership skills. Smith also concluded that the development of these skills aids individuals to deal with the challenges of daily life.

Boler & Aggleton (2005) studied the efforts taken to promote life skills and mass training of these skills. Their work highlighted the points related to the advocacy for life skill training. According to the researchers, life skills as a set of ideas marked their origin in problems related to mental health and management training. However, the concept stepped up to the field of sexual health, especially AIDS and HIV. They pointed out that these skills have speeded their impact in these fields also. They criticized the mark by stating that these approaches remarked the young generation as a "deficit system" with a deficiency in competencies to deal with daily life situations.

Carmack (2005) conducted a study on decreasing drug and alcohol use: The Life Skills curriculum at John Dickinson High School. The study aimed to implement a drug and

alcohol program for ninth-grade students and determine the impact on student attitudes and resistance skills. The study addressed a problem that was found at John Dickinson High School. Delaware Department of Education personnel recommended using a curriculum called Life Skills, which Gilbert J. Botvin wrote. Since 1980, Botvin has developed the curriculum to explore the underlying problems associated with drug and alcohol use. After reviewing the results of the study, measurements showed an impact on student attitudes and resistance skills. Examples of the positive effects on student attitudes could be a pre-test, and post-test results were compared. The comparison results indicated an overall improvement in student attitudes after completing the drug and alcohol prevention curriculum. There were subgroup improvements in resistance skills.

Elias & Kress (2005) analyzed the effect of a classroom-based social decision-making intervention for health promotion and Life Skills development. The study was carried out on middle school students, and effectiveness in terms of academic achievement was analyzed. The results revealed a significant difference in the academic achievement score of the students after the intervention. According to the research, the social decision-making approach blends different thinking and social skills along with cognitive and behavioral skills, which ultimately boosts students' academic achievement. Further, the study also pointed out that these skills are necessary for children's mental and physical health promotion, preventing them from substance abuse and other health compromises.

Slicker et al. (2005) studied first-year university students' perceptions of parents' parenting behaviors and their life-skills development. A total of 660 first-year university students with a mean age of 17.9 years were considered a sample for the study. Tools used for the analysis include the parenting style index, with responsiveness and demandingness as dimensions. The study pointed to study the parents' perception and Life Skills Development Inventory-College Form for students' perception towards life skills. Simultaneous regression was calculated on parents' perception scale, and findings revealed that parental responsiveness significantly affected life skill development. However, parental demandingness was not a significant predictor in any of the four domains of life skills development. High responsiveness in parenting style boosted life skill development among older adolescents: considered age, gender, and socioeconomic status as variables. Still, the results showed positive outcomes, which were the main points highlighted in the study.

Malhotra (2006) investigated the impact of quality instruction with home-based remediation and parental involvement on the Life Skills of fifth graders. The research's

focused area was to analyse the effect of quality instruction with and without home-based remediation on the Life Skills of primary school children. The Total sample chosen was 110 fifth graders students, 55 each in two experimentation groups. Descriptive statistics with various tests and 2x3 ANOVA were employed on gain scores of different Life Skills to study parental involvement and instructional strategy. It was concluded from the study that high parental involvement resulted in higher gain scores for fifth class students, and the quality instruction model remarkably influenced these students. Further, it was stated that Life Skills were improved with the application of specific strategies. It was also concluded that quality instruction with home-based remediation might enhance the students' performance on various Life Skills. It provided a common platform where school and parents could be brought together to improve the different Life Skills of the students.

Zollinger & Cummings (2007) carried out a study on middle school students of Marion County concerning the life skill intervention on tobacco use. One thousand five hundred ninety-eight students from middle school were considered a sample of the study. Three aspects, i.e. knowledge, attitudes, and ability to make good lifestyle decisions, were taken into account to study the effectiveness of the life skill training curriculum. A survey method was used to collect the data from the students of the experimental and control group. The study showed constructive results in the development of positive attitudes and behavior of the students towards anti-smoking. The results also revealed that the curriculum aided students with the knowledge related to the health effects of smoking, and they were readily considering safe health choices.

Anderson & Moore (2009) investigated the impact of Life Skills training programs on school-aged children and adolescents. The program's highlights include:

1. Basic information related to anti-drug norms
2. Educating different social and emotional skills.
3. Drug-refusal skills.
4. Self-management skills.
5. Personality development skills.

The study was exploratory and considered a quasi-experimental design in research methodology. The sample for the study includes school-aged adolescents. Research revealed that the program was proved to be an effective measure for developing social and emotional skills among adolescents. Further, it was indicated in the study that self-management skills gotten improved with the help of such an intervention program.

John & Jessy (2009) investigated the significant levels of changes that a life skills development program brings forth in juveniles' behavior components and problem behavior in juvenile homes. The study aimed to analyze the effect of a life skills development program on behavioral issues related to kids. All the juvenile homes in Kerala were taken as a population of the study, and the sample consisted of male children in the age group of 13-17. The study was implemented in 4 stages. The first stage was assessing and adapting the most suitable life skills development program for the juveniles. The second stage includes pre-testing on both groups concerning dependent variables- behavior components and problem behaviors. The third stage was the implementation part, where life skills development program was implemented on the sample group. The experimental group was imparted with life skills development program. Significant positive change has occurred in the assertiveness behavior of the juveniles in the experimental group after the intervention, and achievement motivation of the experimental group improved significantly. Experimental group juveniles decreased in their impulsiveness. The results indicated a significant decrease in personality problems among the children who were treated with the program. These responses reflect that they have started to practice life skills, which was aimed through active practice and is now echoed in more cordial and productive relationships. Outcomes of FGDs outlined that the juveniles have improved their knowledgebase about life skills and started to practice these skills in their routine life.

Bhave (2010) articulated a study, "Innovative Methods of Life Skill Training Programme", based on young students' life skills training programs. The researcher used innovative methods in program and mainly focused on the factors such as how to deal with risk-taking behavioral issues in sexual and personal life. Among the other topics, the training program addressed prevention of risk behaviors related to sex, prevention of HIV/AIDS, and holistic prevention of lifestyle-related issues during the training program. It was analysed in the study that the program has an strong and positive impact on students.

Kalanda (2010) investigated the impact of the Malawi Government's initiative on life skill and Sexual and Reproductive Health (LS/SRH) education on students and teachers. The program aimed to deal with early drop-out, drug abuse, and reproductive health issues in schools by empowering students and teachers about the aftereffects of drug abuse and other social and health problems through life skill training. Kalanda studied the effect of these interventions on students and teachers of primary and secondary school

and evaluated behavioral changes that occurred due to life skills and sexual and reproductive health programs in students and teachers. Kalanda, in the same study, also studied challenges faced by the trainers during the implementation of the program. It was outlined in the result section of this study that a significant difference was found in behavior change among students after the training. Even it was noticed that this change was slightly more important in secondary school students compared to the students of primary grade. Foremost challenges marked during the implementation were lack of resources such as teaching-learning material, paucity of proper orientation of the trainers, and time for teaching. It was suggested in the study that, due to the high rate of HIV in the country, this program should be more encouraged, and more resources should be made available for the proper and effective implementation of such programs.

Kopp et al. (2010) conducted a study on developmental coordination disorder and other motor control problems in girls evaluated the effect of life skills intervention programs on these disorders among girls of different age groups. One hundred thirty-one girls of varying age groups from a community were undertaken as a study sample and divided into three groups. One group of girls includes girls with developmental coordination disorder (DCD) and other motor control difficulties. Girls with autism spectrum disorder (ASD) and attention-deficit/hyperactivity disorder (ADHD) comprised the second group, and the community sample was considered the third group. The first and second group girls were sent to the neuropsychiatric clinic for treatment. Tools for data collection were the standardized test of motor function and parent interviews and questionnaires. The data from the girls in the clinic were compared with the girls from the community. It was understood from the results that DCD was diagnosed in 25% of clinic schoolgirls with ASD, in 32% of those with ADHD, and in 80% of the clinic schoolgirls with ASD. Further, the report stated that more motor problems were remarked in the clinic's parents.

Rao et al. (2010) analyzed the importance of life skill education (LSE) on behavior modification of juvenile delinquents through their article which was titled as, "Life Skill Education and its importance for the Juveniles in Conflict with Law". According to this article, the juveniles jailed and held in government institutions were not like regular children in our homes, except they can be restored back to society through timely intervention Furthermore, it was pointed out in the article that, Life skill Education functions as a handy tool while orienting them toward a positive lifestyle, and serves to mold the child's character.

Yamuna (2010) studied Life Skills to understands puberty and associated issues in a clinical setting. The study highlighted some of the problems faced by adolescents, related to reproductive and sexual health. Yamuna narrated different physical, emotional and mental changes in the individual during adolescent stage. According to the author, these changes includes physiological changes such as increased energy expenditure, metabolic rate, hunger, appetite and thirst, sleep requirements with delayed phase shift, daytime sleepiness', bone mineralization. In addition, cognitive and emotional changes; sexual changes were also highlighted by the author. The author pointed out the importance of life skill education while empowering adolescents with necessary skills required to deal with such changes as well as to face the challenges of adolescents and future adulthood.

Bhandari (2011) evaluated the effect of the awareness training model on life skills and personal values of secondary school children about their psychological hardiness. Secondary school students were treated with awareness training related to life skills and different personal values. The training was conceptualized in such a way that it would improve psychological well-being among secondary school students. The researcher found that after the implementation of the awareness training model, students achieved higher scores. Psychologically Low Hardy students achieved higher gain means than the Psychologically High Hardy students for Skill of Acquiring knowledge, self-awareness, social skills and skill of Assertiveness when studying through awareness training model.

Botvin & Griffin (2012) studied Blueprints model programs on life skills and their long-term outcomes on teens, who were earlier (in seventh grade) part of their research. According to the researcher, the training model has a long-lasting effect which could be observed even after twelve years. The study sample was 2000, with an average age of 24 years when this follow-up study was conducted and 12 years when the actual program was conducted. It was a survey research model as the data was collected from young adults in their early to mid-twenties after twelve years of participation in the program. Results revealed that participants were 23%, 22 %, and 26% less likely to have ever used illicit drugs, marijuana and non-medical pill (such as amphetamines, barbiturates, and tranquillizers), respectively when compared to the control group.

Sorensen et al. (2012) conducted a study entitled, "Promoting Life Skills and Preventing Tobacco Use among Low-Income Mumbai Youth: Effects of Salaam Bombay Foundation Intervention". The objective of this study was to assess the effectiveness of a school-based life-skills tobacco control program for youth of low socioeconomic status in Mumbai and the surrounding state of Maharashtra. Researchers hypothesized that

compared to youth in control schools, youth exposed to the program would have more excellent knowledge of the effects of tobacco use. Students of the experimental group are more likely to take action to prevent others from using tobacco, demonstrate more positive life skills and attitudes, and; be less likely to report tobacco use. Findings indicate that 4.1% of 8th-grade intervention students (OR = 0.51) and 3.6% of 9th-grade intervention students (OR = 0.33) reported using tobacco at least once in the last 30 days when compared to 8.7% of students in the control schools. Students of the experimental group were also significantly more learned about tobacco.

Puspakumara (2013) carried out a community based quasi-experimental study to assess the effectiveness of life-skills training programs in preventing common issues among adolescents. The study was conducted in the Kurunegala district near Colombo city. Through the cluster sampling method, 54,000 students were selected in the non-interventional group, and 4000 students were established in the interventional group from the 688 schools with grade 6, 7, 8 and 9 classes. A descriptive cross-sectional study was also conducted during the research. Various methods were used for intervention such as teachers training, parents meeting to improve parents' attitude, leaflets and "life skills-wallpaper", provision of student counsellor etc. nine different tools were used to collect data. The results revealed that life skills training effectively prevented a wide range of problems such as substance abuse, teenage pregnancies, violence, Bullying & promoting self-confidence and self-esteem among adolescents.

Jayachandran (2014) carried out a study "Life Skill Awareness among Physically Challenged Adolescents of Thiruvananthapuram District". The study aimed to investigate the level of awareness related to life skills and life skill education in the district. Researcher self-prepared an awareness test based on different life skills and administered on the students to understand the extent of awareness of life skills. Data was collected and analysed through different statistical techniques (Mean, standard deviation, t-test and F-test). It was concluded in the study that significant number of the physically challenged adolescents possessed an average level of awareness related to life skills. The study further added that, there was not much significant difference between male and female adolescents in awareness level, thus gender did not play significant role in extent of awareness.

Jenaabadi et al. (2015) conducted an experimental study in Zahedan to study the effect of Life Skills Training on Mental Health and Level of Resilience. The population of the study was Teachers of Normal Students and Teachers of Exceptional Students. The prime

objective of the study was to determine the effectiveness of collective education life skills on the mental health and resilience of teachers in Zahedan. The experimental design of research consisted of pre-test and post-test design with two groups, i.e. control and testing. The study sample was 60 teachers at traditional schools and 20 teachers at exceptional schools, placed in the experimental and control groups. A psychological intervention was applied to the experimental group, and the practical group members were taught ten basic life skills in 10 2-hour sessions. Mental health and resilience questionnaires were used to collect the data after the training sessions. The study's findings showed the positive effect of life skills training on mental health and the level of resilience of teachers at regular school and teachers of exceptional school.

Hita & Kumar (2017) conducted a comparative study between adolescent boys and girls regarding the effect of life skills training on emotional distress. Adolescence is considered a crucial stage for emotional development. The study used a pre-and post-test experimental design with a control group. Based on initial screening and test scores, 160 adolescent students between the age of 10-19 years (mean age = 16.44) were selected for the study from different schools and colleges in Mysore city. The sample consisted of an equal number of adolescent boys and girls, i.e. n=80. From these 80 selected participants, the model was randomly assigned to the experimental and control group, respectively. Each group consisted of an equal number of male and female adolescents, i.e. 40. The positive and Negative Affect Schedule (PANAS) was developed by Watson, Clark and Tellegan (1988) to assess emotional distress. Participants of the experimental group were trained on 6 of the ten core life skills in 10 sessions of 120 minutes duration twice a week. Participants in the control group were not subjected to any such training. The data were treated through descriptive statistics, independent sample t-test and repeated measures of ANOVA. Significant findings of the study revealed that Life Skills training has a substantial effect in reducing emotional distress and improving emotional health in adolescents; moreover, female students gained more from life skills training than male students.

2.2.2 Summary

The researcher under different headings categorized reviewed literature. Under the first heading, i.e., Life skills for behavior development, the researcher listed those studies which focus on substance abuse, reproductive health, gender issues and development of behavior through life skill training for all age groups. The researcher reviewed almost 48 studies under this category, and 35 found the most relevant, reported here. The studies

put down in this category were related to the achievements of life skill training in reducing substance abuse such as cigarette smoking (Botvin et al. 1980), drug abuse and alcohol (Botvin et al. 1995, 2012), tobacco prevention (Zollinger et al. 2003, Botvin et al. 2003), enhancing self-confidence, self-esteem, reproductive health, gender issues (Roylew 1983, Meyer & Steyn 1992, Khera & Khosla 2012), developing behavior (Misner 1995, Nair 2005). Elias et al. in 1991 and Caplan et al. 1992, through their study, highlighted the importance of life skill training in bringing down the number of young people engaging in delinquent behavior and social adjustment.

Lobner (1997), Magee in 1999 and Weitlauf, Smith & Cervon in 2000 studied the effect of life skill training on the students in conflict areas and women with aggressive behavior. They determined that life skill training positively impacted their decision-making abilities, problem-solving, interpersonal relationships, aggression, and conflict management with others. Weichold et al., in 2002, found that life skills programs could effectively deal with adolescent issues, and the effect was not gender specific. Botvin, Griffin, Paul & Macaulay; Zollinger, Cummings & Caine in 2003; Smith in 2004; Carmack (2005); Zollinger & Cummings in 2007; Anderson & Moore in 2009; Bhave (2010); Botvin & Griffin (2012); and Sorensen G., Gupta P.C., Nagler E. & Viswanath K. (2012) also supported the same point. They also highlighted the importance of life skill training for adolescents, explicitly dealing with behavioral problems and tobacco and alcohol use. Through his study, Carmack (2005) proposed the introduction of a life skill curriculum in the schools to deal with the problems of alcohol, substance abuse, and other drug-related matters. In a similar line, different studies were completed at different age groups, bringing similar and positive results into the limelight.

Some researchers Padmanabhan, et al. (2003), Davis (2004) and Bhandari (2011), worked for the improvement in the self-concept, Assertiveness, depression, and anxiety of students at different age groups with the help of life skills program. Boler & Aggleton; Elias & Kress (2005); Yamuna (2010), and Kalanda (2010) analyzed the background to advocacy for Life Skills Training. They highlight how many skills-based approaches construct young people as "deficit systems" lacking incompetence while adults are generally assumed to live risk-free lives and know all the answers. They emphasized classroom-based social decision-making intervention for all age groups for health promotion through the education system.

Slicker et al. (2005) and Malhotra (2006) suggested that positive life skills development in children is related to being reared by a parenting style high in responsiveness. The

studies concluded that home-based remediation, which includes fostering techniques and high parental involvement, could develop life skills in children. Kopp & Gillberg in 2010 and Jenaabadi et al. in 2015, through their study, investigated that Motor coordination problems in children were directly related to issues such as lower ability in daily Life Skills. Further, they emphasized that life skills play pivotal role in the development of mental health and mental well-being in children. Similarly, Hita & Kumar in 2017 studied the effect of life skills on emotional and mental conditions of girls and boys in a comparative way and found that the training is having a significant impact on girls when compared with boys. They also pointed up the unique effect of life skill training in reducing emotional distress and improving emotional health in adolescents.

The studies by John & Jessy (2009); Rao et al. (2010) underlined the seriousness of life skill training for behavior modifications of juvenile delinquents. Puspakumara (2013) implemented a community-based study to determine the effectiveness of life skills training for common issues among adolescents. Various methods used for intervention include teachers training, parents meeting to improve parents' attitudes, leaflets and "life skills- wallpaper". Further, the findings were: life skills training effectively prevented a wide range of problems such as substance abuse, teenage pregnancies, violence, Bullying & promoting self-confidence and self-esteem among adolescents.

2.3.1. Studies on Life Skill Education for Social and Emotional Development

Greene (1988) studied instructional principles to help educators model and mentor effective Life Skills behaviors for their students. The researcher conceptualized that, for the child who doesn't have friends, does poorly in sports, has difficulty in learning, or steals, lies, or bullies. The researcher analyzed the effectiveness of life skills as an important tool for teachers and mentors, in handling such issues among students. The investigator provided solid, proven methods to help these learners discover and practice better Life Skills. The results found that teaching with awareness models brought positive changes in their skills and help children in overcoming such problems.

Hamburg (1990) in a study entitled "preparing for life: The critical transition of adolescents", reported that it is an essential requirement to teach life skills among students of middle and primary school. Through these skills, students learn interpersonal relationships while living with each other, which help them to succeed in life. An introductory section discussed early adolescent development and Life Skills and core elements of Life Skills training. The focus of the intervention was on these central themes:

1. life skills such as Interpersonal Problem Solving, Social competence training, a drug and alcohol project, linked school and community programmes
2. the Midwestern, a drug and alcohol-based interventions, including girl clubs of America, the summer training and education programme, and salvation army; and
3. promising new conceptual models including the school development programme,
4. community prevention of alcohol and tobacco use,
5. the violence prevention project, and research leading to an anticipated middle school violence prevention curriculum.

The researcher concluded that it was needed to disseminate information about practical Life Skills training and recommendations for implementing preventive programmes for middle schools.

Mize & Ladd (1990) investigated the effectiveness of Life Skills training based on cognitive and social learning strategy focusing on low-status preschool children. Life skill training was implemented on pre-school children with low-status. The research concluded that Life Skills education prevented peer rejection and improved the Life Skills like empathy, self-awareness etc. and bullying among adolescents reduced/decreased.

Paul et al. (1990) investigated children's performance of practical Life Skills. The authors pointed that, though the child competencies domain was less focused in terms of research, but has a valuable impact in real life. The sample group includes children from either 8-9 years or 15-16 years and one parent. Data were collected from children and parents based on children's knowledge and performance of 20 life skills. Parents and children generally agreed on children's abilities at significant levels. It was also highlighted in the study that life skills competence has a significant association with parental attention, parental loss, and maternal employment among younger children and never measured academic competencies. Development of Life Skills competencies amongst adolescents means focusing on maternal work, family size, the frequency of family activities, and parental education.

Halter & Lang (1994) designed guidelines to help adolescents develop skills that encourage them to make healthy and positive choices about life. The designed guidelines assist parents and teachers also, as they were the mentors of young people throughout life. The book used a series of written exercises to help organize the students' goals and aspirations for life. The subjects were divided into five sections. They appreciated differences, personal development, family and values, making choices, and making a

difference. The guide contained 96 one hour lessons, including 18 student-driven classes scheduled to occur once a week. Topics in the text included gender equity and cultural diversity. The stages of personal development were examined in-depth, with particular attention given to Self - Esteem, creating dreams, and skills development (Communication, Achievement, Decision Making, and Time Management). The importance of personal integrity and health and the need to maintain healthy relationships with friends and family. Themes like money management and career planning were interrelated in the program. Different ways to address and change the world would be explored through the exercises. Worksheets and activities were included to help students learn these solutions.

Reed (1994) conducted a study to determine the impact of life Skills-based structured learning therapy on depression among students. The study was experimental. Students, having depression as a major issue were treated with a therapy that focused on life skills. Data were collected from experimental and control group, to study the effectiveness of the therapy. The researcher noted that structured learning therapy based on Life Skills reliably reduced depression and improved the level of functioning of boys in the treatment group.

Nava (1998) studied "the self-perception of personal skills between traditional versus non-traditional college students". The research concluded that traditional and non-traditional college students were found to be significantly indifferent to the self-perception of personal Life Skills. The personal Life Skills measured were self-esteem, Assertiveness, drive strength, decision-making, time management, commitment ethic, stress management, aggression, and deference using the personal skills map.

Waltemire (1999) in a study entitled "a kaleidoscope of opportunity: teaching Life Skills", studied the effect of life skill education on college students. According to the investigation, students seen between ages of 17 and 19 who received Life Skills training experienced a reduction in emotional turmoil and frustration. This study discovered substantial variation in the self-perception of personal Life Skills among conventional and non-traditional college students.

Rowland (2002) conducted a study entitled every child needs self-esteem: The creative drama builds self-confidence through self-expression. This work illustrated how creative drama, when used with socially deprived children under the direction of trained outside the classroom in a structured, informal setting, emphasized play as a powerful way to learn, strengthened a self-concept and increased self-esteem. Testing revealed how

natural pedagogy, which respects the individual experience and preserves the child's essential freedom to play, wonder, experiment, and invent, allowed children to flourish and become stable and prosperous—applied this theory to children through a creative drama programme. Through the magic of theatre, innovative drama techniques, children's creativity developed self-esteem and learned cooperation and responsibility. These results led to creating a child play-based programme that nurtured children's creative expression and developed a handbook to enable others to replicate this programme in their communities.

Thurston (2002) examined the impact of a life-skills management program and survival skills for youth. Researcher planned a survival skill and life skill management program for the rural youth. The program was delivered to ten groups of rural youth in Tennessee and Missouri via collaborative efforts of educational and non-educational agencies. University Extension, school districts, juvenile justice programs, and state human service or workforce development agencies were working in collaboration with for the effective implementation of the program. Each program was jointly taken care of by two or more working agencies. Pre and post-assessment of the data showed that the Life Skills programme effectively changed the attitudes and behaviors of rural youth.

Sharma (2003) attempted to measure the life skills of adolescents in a secondary school in Kathmandu. Through the study, The researcher developed a scale to measure the levels of life skills in adolescents. A descriptive and cross-sectional survey as a research methodology was used in the study. The sample includes classes 347 students from VIII, IX, and X of a public co-educational secondary school in Kathmandu. A self-prepared questionnaire was used as a tool for data collection. A questionnaire was prepared in English and translated into Nepali. Results from the data analysis revealed that One hundred seventy-six students had statistically higher life skill scores that was further called as having a "high level" of life skills, whereas 171 students which were nearly 49% of the total students possessed "low level" of life skills scores. The study concluded as:

1. The majority of teachers were unfamiliar with the concept of life skills. Maternal education was found to be strongly correlated with greater tiers of life skills in adolescents.
2. mother's education play a significant role in improving life skills as it was significantly related with an increased level of life skills in adolescents.

3. Other major factors affecting life skills in children and teenagers were interconnectivity and family functioning.

Shangold (2004) conducted a study of Life Skills training programs for the youth of high schools in Mississippi. The program included coping skills, social skills and behavioral skills and was planned for 530 high school students. The results revealed significant coping skills for anxiety and depression, interpersonal and cooperative skills, and hostility skills.

Phelps (2005) compared participants' self-reported personal and leadership life skill development of Louisiana High School 4-H leadership activity. The sample group was all high school students who participated in the Character Counts (CC) peer-teaching program or the 4- H Junior Leader Club (JLC). A survey instrument was emailed to 321 high school students, with 165 surveys returned. Results showed no difference in the perceived personal and leadership life skills development among the three groups on the Leadership and Personal Development Inventory (LPDI).

Gamble (2006) researched teaching Life Skills for Student Success. In this study, the researcher analyzed that Chicago Public Schools (CPS) took a survey on the students to find the reason on related to unemployment of their students. CPS concluded with severe results and recognized that their graduates were struggling to find employment, and those who found work were having difficulty retaining it. Further, to resolve the issue, educators of CPS hired a private organization to formulate a curriculum that could find a solution to unemployability among young ones. The curriculum "All students can learn" addresses employability skills for junior high school students through university students and adults entering the workforce. Through this advanced curriculum, CPS achieved success and was later introduced in regular school.

Meena (2006) conducted a study entitled "Impact of Barnlund transactional model of communication on Life Skills of secondary school children about their learning approaches". The main objective of the research was to study the impact of Barnlund transactional model of communication and learning approaches on the Life Skills of secondary school children. The sample of 296 students was drawn from four different govt schools, U.T., Chandigarh, through a random sampling method. One hundred thirty-nine were denoted to the experimental group, and 157 were in the control group. Results showed that Barnlund transactional model of communication was very effective in enhancing the students' performance in the economic subject at the secondary level compared to the traditional teaching method. It was evident that the Barnlund

transactional communication model was also a very effective and valuable tool for enhancing the students' Life Skills, i.e., critical thinking, decision-making, and communication skills. Further, the results showed that the students with the deep approach of learning, who usually have a high potential for long-lasting learning, may satisfy their deep urge through the Barnlund transactional model of communication with equivalent impact on surface approach on students.

Sterling (2006) explored the influence of a life skills course on collegiate student-athletes athletic identity and career decision self-efficacy. A pre-post-test control group design was considered for this work. Significant differences were found between the treatment and control sports groups on career decision self-efficacy and athletic identity. The results also indicated that an alarmingly high percentage of student-athletes anticipate a professional sports career. The unrealistic plan may lead to muscular career termination difficulties. This led to the need for an extra training hour for the life skills course, which would allow for a career development component.

Lynch (2007) conducted an exploratory study to understand the effect of an independent skill training on flexibility, social support, and life skills. Sampling was purposive, as sixteen young students who varied ethnically, along with nine staff members from the Texas Department of Family and Protective Services were included in the sample. Youth participants were recruited through several state-contracted agencies that provided life skills training to youths in Texas. Data analysis was done through descriptive and inferential statistics with the help of content analysis. Scores on standardized measures of resilience, social support, and life skills were analyzed and compared. Statistically, a significant difference was found in individual scores, whereas the final scores on measures of resilience and life skills showed an average improvement. It was also discovered that, while not statistically meaningful, results on the degree of resilience were all in the "elevated" range, possibly implying high degree of internal as well as external resources. Simultaneously, scores on a results in a positive of life skills revealed that youths mastered nearly half of the life skills. According to the research results, respondents indicated physiological relatives as their most important elements of interpersonal assistance and motivation. Teenagers' characterizations of welfare protection, adaptability, and life skills were coherent with their scores on standardized assessments. The most common possible explanations by faculty respondents for a youth's absence from life skills training were location adjustments and a transportation problems. Furthermore, most participants struggled to describe and recall life skills

relevant data such as handling finances and determining suitable accommodation, which was coherent with scores indicating they "managed to master" only around quarter of all components on the life skills assessment. Findings from this study highlighted the strengths of foster care youth and have implications for future use of strengths-based theories and frameworks and gender-specific life skills training. Analysis result also indicated essential consequences for teaching life skills to children in foster care and policies related to independent living services.

Kenneth (2008) analysed the impacts of life skill training on academic stress among students of secondary school. The sample for the study were tenth grade students. Stress management training program was conducted by the researcher on tenth standard students. They were taught how to cope with academic stress and balance with other activities. The study concluded that such program had significant effect on students and their academic stress. Students who were educated with stress management programs develop skills to effectively manage and control academic stress. The researcher also suggested that school has a significant role in the contribution of stress to the students, and proper management of stress is an essential concern for future success among students, thus such programs in school assist students in dealing with such anxiety.

Madhu (2008) emphasized the importance of life skills-based education in the article on the relevance of life skills-based education. The Researcher opined that life skills-based education help to empower children and young adults in challenging situation. It enables the acquisition of knowledge, development attitudes and skills, which support the adoption of healthy behaviors. It makes the learner aware of various types of risk-taking among adults. Its primary aim is to help students develop the personal and social skills necessary to live in harmony with others and behave in positive and caring ways that respect fundamental human rights. Life skills education enables children to learn to cope with emotions, stress, disappointment and feelings of fear and suggests that the education system must address these vital issues through the life skills education approach because it can improve the lives of millions of children.

Scott & Jenifer (2009) determined the significance of life skill teaching for achieving success in life. The study was carried out for the alumni, students, teachers, and parents of a student-centred charter school in Minnesota. Through this work, researchers attempted to understand the definition of success in developing life skills through project-based learning. Surveys through email were sent out to alumni, students, teachers, and parents of the experimental school. One of the criteria to measure success was based on

the number of students going for four-year courses in higher institutions. Data were collected from 147 individuals (alumni, students, teachers, and parents). Findings of the study revealed that academic skills (test-taking and note-taking) were less developed when compared with life skills (creativity, ability to find information). It was also highlighted by the study that although the graph of achievement in academic skills remained steady yet more than half of the alumni who were graduated from the college, showed comparably higher academic skill score when compared to the national average which was 39%. It was revealed in the study that the sample school was proved to be excellent at teaching critical Life Skills. It was suggested in the study that instructors should be given prospects to exercise academic skills such as note-taking and test-taking among students to make improvement in project-based learning schools.

Yadav & Iqbal (2009) studied the "Impact of Life Skill Training on Self-esteem, Adjustment and Empathy among Adolescents" to understand the impact of life skill training on self-esteem, adjustment, and empathy among adolescents. Life skill training program was conducted by the researchers on adolescents. The data analysis showed that adolescents exhibited improvement in self-esteem, emotional adjustment, total adjustment, and empathy after the treatment and the improvement was statistically significant. However, it was also revealed that not much variations were observed in social adjustment among adolescents before and after the treatment. In general, it was found that there was an overall improvement in all the measures except social adjustment, thus showing that life skill training shows positive results in bringing change in adolescents' attitudes, thought, and behavior, providing a supportive environment.

Bharath & Kumar (2010) investigated the impression of life skills education programme based on NIMHANS model by assessing the difference between adolescents who attended the programme with those who didn't. Sampling was random and 100 life skill educator-teachers and students were considered as sample for the study. It was analysed through the study that adolescents in the programme showed significant improvement in self-esteem and coping skills. Subsequently it was also generalized in the study that, better adjustment of students in general as well as in specific with teachers, and school, along with improvement in pro-social behavior was observed. Not much difference was observed between control and experimental groups in psychopathology and adjustment at home and with peers. The likely changes perceived by students were improvement in classroom behavior and interaction. The study suggested that if life skill

education integrated with mental health programs in school, it would yield remarkable results.

Galagali (2010) in an article on "Adolescent Life Skills Education Programme: The Bangalore Experience" detailed the impact of life skill education program among students. Through the article, researcher shared her understandings of life skill education program carried out in Bangalore. In the article, the author detailed that life skills education empowers adolescents in both knowledge along with skills which aids them with necessary competencies to deal with the difficulties of regular life, challenges faced by them during different stages of life and managing different situations effectively. Life skills education also augments positive and optimistic atmosphere at school and community.

Kavitha (2010) done conceptual analysis on adolescents' empowerment issues under study entitled, "Empowering Adolescent Girls in Rural Areas". The author states that the girl-to-girl approach can be a better approach while delivering life skills education to the girls in rural areas as it was not much practicable to collaborate with all the stakeholders through a single-window system in rural areas for the smooth functioning of such training programs. It was analyzed by the author that in rural areas, adolescent girls need specific attention, proper education, along with right and guiding information to empower themselves. It was asserted in the study, that generative intervention strategies for adolescent girls are obviously limited and infrequent in rural areas, and if there was any, it did not address the concerns and prerequisites as a whole. It was essential to construct a personalised learning package for them which mainly focused on their gender and location-specific issues and concerns. Such package should be framed by collaborating with different of individuals, families, and communities through community decisions, strategic planning, and educational reforms.

Mariachelvi & Jayapoorani (2010) carried out an action research among the street children of Coimbatore to study the impact of life skills training. The study was carried out on street children and highlighted that life skills training programme has shown statistically significant results. The researchers pointed that life of adolescents who have undergone the training programme was meaningfully impacted and they feel motivated as well as develop positive attitude. It was also analyzed that there was a remarkable enhancement among trained children in terms of their knowledge and skills on taking care of minor injuries and illness, they developed sense of personal hygiene and sanitation. The study has proved that if trained professionals provide training in life skills

according to the needs of the children, the results will be remarkable, and also positive developments in behavior and attitude can be easily achieved.

Nejad (2010) conducted an experimental study in Iran. The study focused on analyzing the impact of Life Skills training on self-esteem, mental health and assertiveness. Personal Data Sheet, Mental Health Questionnaire, Self-esteem Questionnaire and Assertiveness Questionnaire were the tools used for the study. The sample of the study were the students of Boosher's high school in Iran. Quantitative data analysis techniques were employed to analyze the data. The results revealed that the Life Skills training had a significant and development effect on mental health, self-esteem, and assertiveness among the students in the experimental group.

Rani (2010) explored Gita in terms of Life Skills in a study, "Integrating Culture-Specific Inputs from Bhagavat Gita in Life Skills Education". The researcher attempted to analyze the core life skills with respect to the teachings of Bhagavat Gita. The author explained that thinking skills with much focus on creative and critical thinking were the highlighted life skills that were mostly explained in the teachings of Gita. In the abstract of the study, the author further discussed different life skills such as interpersonal relationship skills, self-awareness, empathy, coping with emotions and stress were also the pointed abilities highlighted Gita.

Garg (2011) examined the life skills and academic anxiety of secondary school children. She found that the relationship between life skills and theoretical anxiety correlation was calculated and highly damaging. Girls possess more life skills than boys. Private school students have better Life Skills than government school students.

Ozaeta (2011) explored the impact of the Teaching Personal and Social Responsibility Model (TPSR) in teaching life skills. The study aimed to analyze the effect of the four primary TPSR goals. The research sample includes Students (11 boys, two girls), two classroom teachers and an extended day program director. A specific group of African American and Pacific Islander students at an underserved urban K-5 elementary school were taken as a sample. The program was carried out once a week for two years (45 sessions). An interpretive/constructivist approach to program evaluation was used. Collected data was qualitative as mostly the program's experiences, perceptions, and individualized outcomes were collected. The study supported the fact that there was a direct relationship between four primary TPSR goals and the school environment as the school was most prominent and reliable opportunity for the transference of these goal. TPSR nurtured a constructive atmosphere that boosts self-development and consideration

for others among youth. Thus, TPSR exemplified the larger scope of youth empowerment. It was also determined through the study that developing constructive teaching and learning interactions was a critical component of youth development programmes.

Shea (2011) tried to understand a relationship between the level of Life Skills self-efficacy and specific learning difficulties in reading and writing (SpLD) in Hong Kong. The study was carried out the among students with dyslexia. The study focused on comprehending associations between self-efficacy and the factors in their micro-and meso- systems, such as gender, grade levels, perceived academic achievement, parenting practices, and school connectedness. Sample for the study includes 133 students SpLD. Tools used to collect data were Life Skills Development Self-Efficacy Inventory which Further includes four different scales namely, Self-Efficacy form including: Academic Self-Efficacy (A-SES), Personal Self-Efficacy (P-SES), Social Self-Efficacy (S-SES), and Career and Talent Development Self-Efficacy (CTD-SES); and other scales were: School Connectedness Scale (SCS); Parent Support Scale (PSS); Parent Control Scale (PCS); and a personal data form. Different comparisons were established to understand the effect of life skill training on Students with SpLD such as level of self-efficacy of the participants to the normative data collected from students about their grades in mainstream schools. The findings revealed that SpLD participants had justifiably progressive attitudes of their own personality in the academic, personal, social, and career and talent development realms. Their personality and self-level was significantly compared to the local prescriptive group. It was analysed in the study that girls as compared to boys were more confident during the application of life skills in their academic or any other related field.

Missett (2012) comprised three independently conducted studies linked to developing thinking skills deemed necessary for the 21st Century. In this study, Missett remarked that to meet the requirements of the challenging world, stakeholders in education were promoting creative and critical thinking skills; simultaneously, they also mandated accountability through evidence-based educational practices. These studies tried to evaluate the relationship between creative and critical thinking and 21st-century skills. The first study was qualitative and focused on the investigation of learning outcomes for secondary students who participated in an advanced, online, case-based environmental science course. There was an improvement in critical thinking among most of the students who were treated with a research-based curriculum. In the second group, the

researchers analysed development in problem-solving abilities, creative and critical thinking, and teamwork among experimental group students. Further, results revealed that participation in the program supported growth in 21st Century skills among participants. The third group were assessed with the relationships between critical thinking and divergent thinking in middle school students. Study further revealed that the significant differences were marked in these relationships for students of the experimental group. Results illustrates that the significant improvement was noticed in 21st century skills and other related competencies among students treated with life skill curricula.

Nair (2013) studied the role of life skills particularly focusing on social skills for overall well-being. Data were collected from 220 school-going adolescents. Life Skills assessment tool developed by RGNIYD, for determining life skills such as social skills, thinking skills and coping skills and, Ryff Scale of Psychological Well-Being (RSPWB) to understand well-being were the tools used to collect data. The study results showed that psychological and social wellbeing can be enhanced with the help of social skills and development in social skills can be envisaged by psychological wellbeing. The author suggested that early school interventions would be beneficial for developing social skills among children from the beginning of their educational career. It was also concluded in the study that social skills were also responsible for the improvement in stress coping skills and have direct association with overall growth and development of the child.

Deshmukh (2014) examined the impact of life skills training on emotional, educational and social adjustment of secondary school children. The study determined to analyze the importance of life skills training on three aspects related to the adjustment, i.e. emotional, educational, and social. Quasi-experimental research design was used by the researcher. The study was conducted on secondary school children. Experimental group students were given practical knowledge of life skill training. The findings indicated that the mean score of the emotional, academic, and social adjustment statistically differed significantly in the intervention group before and after the intervention.

Kumar & Chhabra (2014) emphasized life skills education for adolescents to assist them in coping with challenges. The paper focused on the immense changes that have taken place in our traditional society in recent years due to industrialization and globalization. The authors stated that these changes impacted adolescents also, as it created unnecessary stress and other psycho-social issues among young generation. The authors highlighted the importance of traditional norms and family support as stress

boosters. Further, the authors mentioned that absence of these values in todays' generation leads to anger issues and low self-esteem which ultimately results in disruptive academic performance and other behavioral issues in school and at home. It was suggested in the study that developing behavioural and psychological competencies through life skill education help in overcoming these issues.

Meena (2014) investigated the effectiveness of Life Skills education programmes for adolescents to assess the effectiveness of Life Skill Education on Knowledge and attitude of adolescents towards different aspects of life skills. The investigator adopted the adolescent's Health Education module developed by SCERT and other materials prepared by the Centre for Adult Continuing Education and Extension, University of Kerala. Tools used were: awareness test, attitude scale, situations test, application test and skill development test. Researcher employed pre-posttest non-equivalent group design in the study. The research summarizes the effectiveness life skill education for adolescents. The study emphasized that life skill education should be incorporated in the education system from the initial stage, i.e. from class one.

Pourjafari (2014) steered a study on life skill programs for adolescents with an to analyse the progressive changes in identity status and their influence on problem-solving abilities. The study was carried out in three phases: a survey, program development, and an experiment. The conceptual part, along with reviewed literature, were considered secondary data. The primary data were derived from the answers of participants during experiments. Analysis of data from the survey was a direction to develop a life skills program, and the result of the investigation presented the effectiveness of the expanded program. The study concluded that the developed program was positively effective on adolescents.

Richard & Kumaravel (2014) examined the impact of Life skill Education on Stress Management. The investigator tried to determine the effectiveness of life skill education for stress management among IT professionals. Sample of the study includes Forty IT professionals from Bangalore. Researcher used pre-post single group experimental design for the study. Ten core life skills with special focus on stress management and coping skills were the highlights of the training program. Data was analysed and results revealed that there was a significant decrease in stress level with upsurge in positive coping skills. It was also highlighted in the study that after the training, participants showed remarkable decline in negative coping skills.

Sardesai et al. (2014) worked on the usefulness of Life Skills Education in managing stress and anxiety among adolescents in their day-to-day life. The study examined the relationship of stress, anxiety and life skill education and their interdependence on each other. Analysis of the data showed positive results. It was concluded in the study that almost 44% of the adolescent participants experienced high anxiety related issues whereas, 9% reported high level of stress before the treatment. Even though the stress level was low, the literature revealed that the experience of anxiety often precipitated the stress level.

Singh (2014) in an article entitled, "Significance of Life Skill Education in Entrepreneurship Development", found the usefulness of life skill education in development of entrepreneurship among entrepreneurs. Pre-post quasi-experimental design was used during the study. Self-developed questionnaire schedule was the tool used to collect data from selected sample group. Positive development in entrepreneurship skills were the outcome of the study. It was also suggested by the author that such skill-based interventions help in the overall development of the other related competencies.

Suresh & Vivek (2014) tried to explore the Impact of Life Skills Education on Adjustment Problems among Adolescents. The study remarked that life skill training is also a practical for the students to understand and apply different skills in directly or indirectly related situations. The study aimed to analyse the extent of self-awareness and interpersonal relationship. One group pre-test post-test experimental design was used for the study. Sampling was done through purposive sampling technique. Self-developed life skill module with activities were developed by the researcher for the training. Pre-test and post-test were compared to understand the relationship. The results revealed that the training was much effective in the development of self-awareness and interpersonal relationship.

Susan & Suprabha (2014) discussed the importance of life skill training as well as application of skill-based training for the children with special needs. The conceptual paper highlighted the relevance of special skills for the overall development of the children with developmental abilities. It was also stated that such children need to be given special attention to encompass them in mainstream. Authors pointed that each and every child must be acquainted with the dos and don'ts of managing such children in their classrooms. Teaching-learning of life skills help and encourage children with special needs to manage their daily life more effectively.

Bender & Lombard (2015) developed and implemented a life skills programme for Grade VII learners. It also evaluated the effect of the life skills program on personality development and social competencies. The study focused on 7th standard students from traditional African school. The study concluded that integration of life skill training in school curriculum supports development of social skills, health and hygiene, vocational and general education. It was also added in the results that training program provides positive guidance and counselling and strengthened children emotionally and psychologically which contributes to the optimal social functioning of children in the classroom, school, family and community.

Prakash & Devi (2015) examined the level of Life Skills among undergraduate students. The study was conducted in Chennai, and the study sample comprised 100 undergraduate students, 50 male and 50 females from Arts and Science Colleges in and around Chennai. The model consists of 32 students from Government, 47 Govt. They aided and 21 students from Private colleges. The tool used to gather data was the self-developed Life Skills Assessment Scale. It was a three-point attitude scale having 70 items, including 56 positive and 14 negative statements. Analysis was done using the SPSS package. According to the report's findings, the extent of Life Skills among undergraduate students is reasonable. Furthermore, statistics found a significant difference in students' life skills based on their area of study, teaching methodology, place of residence, and attendance at any life skill curriculum. Nevertheless, no substantial variations in students' life skills were discovered when gender and category of college administration were considered.

Thote (2015) conducted a study to determine teachers' attitudes towards In-services Training Programmes of Life skill education. The sample was selected randomly and almost 100 primary school teachers from Central India were considered for the sample. A self-made research tool, was used for the data collection. The research data was analyzed using a t-test. The inference of the study was concluded as that not much substantial difference was found in teachers' attitudes with respect to rural-urban, male-female and teaching experience towards in-service training programs of Life Skill Education.

Buvaneswari & Juliet (2017) carried out a study to assess the life skills of first-year B.Sc. nursing students in Tamilnadu. A Cross-sectional descriptive survey design was used to determine the life skills of nursing students. From all first-year B.Sc Nursing students of selected nursing colleges, Tamilnadu constitutes the population of the study. 40 first year B.Sc. Nursing students who met the inclusion criteria were selected as

samples by using the convenience sampling technique. The Life Skills Assessment Scale by Nair et al. 2009 was used to gather data along with the socio-demographic details of the students. Data analysis was done through descriptive as well as inferential statistics at a 5% level of significance. The study concluded that most first-year nursing students, 30 (75%), had average life skills scores, and 2 (5%) of them had a meagre score in life skills. No association was found between life skills scores and socio-demographic variables of students. The study suggested some mode of training to enhance the life skills of first-year B.Sc. Nursing students.

Kumar (2017) highlighted the need and importance of life skills education. The study concerned the necessary life skills, their effect on children's development, and life skills education during schooling. The researcher believed that life skills are the basis of forming a good personality by developing certain characters in the students. Everyone has inherent Life Skills but to get the best out of the training is required to get them shaped. He further stated that today relevant and proper implementation of life skill education is a need of time. Imparting life skills education to the students may help address the needs of children, helping in motivating, providing practical, cognitive, emotional, social and self-management skills for life adjustments.

In their paper, **Prajapati et al. (2017)** focused on the significance of life skills education regarding adolescents. Researchers believed that life skills education bridges the gap between basic functioning system of an individual and more perfectly managing all the situations of the life. Further, the researchers stated that life skill education strengthens the competencies of an individual to meet the needs and demands of the present society. Inculcating life skills in adolescents through imparting life skill training will help them overcome the difficulties and problems in life. Further, it emphasized the significance of life skills education and the outcomes of integrating life skill education in the curriculum, i.e. developing social, emotional & thinking skills in students. In addition, the researchers suggested different activities that may enhance life skills in students, such as brainstorming, role-playing, educational games and simulations, etc. Life skills are essential for a dynamic citizen who can cope with future challenges and survive well.

Vijayarani & Geetha (2017) analyzed the awareness and intentions of B.Ed. Trainees regarding some common life skills and value education-related awareness. The study was an exploratory study based on the primary data of 200 B.Ed. Trainees in and around the Coimbatore district. The study aimed to find out the life skills and value of education and the impact of personal variables on life skills and value education among B.Ed. Trainees.

The survey method was used for the study, and 200 B.Ed. Trainees from seven B.Ed. Colleges were selected randomly as a sample of the study. A self-made questionnaire on Life Skills and Value Education was used to collect data for the analysis. The study's findings indicated that female students have a higher level of life skills and value education than male students; similarly, rural students have a higher level of life skills and value education than students of urban areas. P.G. qualified students and students from joint families have slightly better life skills and value education than the U.G. qualified students and the students of nuclear families. However, found no significant difference between life skills and value education among B.Ed. Trainees concerning gender, school location, educational qualification, type of family, medium of instruction, nature of college, educational qualification, occupation and monthly income of parents.

Kaur (2019) investigated the impact of family environment, school environment and socio-economic status on the development of life skills among senior secondary school students about locale, gender and Government and private schools. The study's primary objectives were: to explore the difference in life skills among senior secondary school students concerning rural and urban areas, government and private schools, family environment, school environment, and male-female. The data was collected from 1200 students studying in senior secondary schools in four districts of Punjab, namely Ludhiana, Patiala, Moga and Ferozepur. The information was compiled based on four scales:

1. Life Skills Scale developed by Nair, Subasree and Ranjan (2010),
2. Family Environment Scale by Bhatia and Chadha (2015),
3. School Environment Inventory (SEI) by Misra(2012),
4. Socio-Economic Status Scale by Upadhyay and Sexsena(2008).

Findings revealed a significant difference between the life skills of females and males; rural and urban students and students of government and private secondary schools. It was highlighted in the study that life skills should be developed among students, and many activities like extension lectures, life skill training programs, cultural programs, games etc., should be organized in the schools by school authorities.

2.3.2 Summary

Studies related to Life skill education for overall development in students were discussed in this category by the researcher. Nearly 65 studies were analyzed by research, and out of these, 65, 48 most relevant to the present study, were scrutinized. The effectiveness of

different skills developed through life skill education for students was detailed in this part of the literature review. Studies like Mize & Ladd (1990), Paul et al. (1990), Hamburg (1990), Missett (2012) threw light on a child's competence which could be enhanced with the help of different life skills. Greene, in 1988, detailed in his study a few instructional principles to help educators develop effective Life Skills behaviors for their students. In the same line, Halter & Lang (1994); Nava (1998) also designed guidelines for adults to help adolescents, with particular attention given to Self - Esteem, creating dreams and skills development such as communication skills, decision making, problem-solving. Many scholars (Sharma, 2003; Phelps, 2005; Prakash & Devi, 2015) also tried to measure students' already present life skills using a self-developed life skill measuring scale. Furthermore, they concluded that life skills were not a familiar concept among teachers and Maternal education was a driving force strongly associated with higher life skill levels in adolescents.

Reed (1994); Waltemire (1999); Thurston (2002); Shangold (2004); Lynch (2007); Kenneth (2008); Scott & Jenifer (2009); Nejad (2010); Richard & Kumaravel (2014); Sardesai et al. (2014) worked for students and youth in distress. The results highlighted that teaching life skills through different learning therapies would help students deal with pain and improve self-perception, coping skills, mental health, and behavioral skills. Thurston (2002) spotlighted the significant role of different organizations (educational and non-educational) working in collaboration for changing attitudes and behavior of rural youth towards their career management problems. Studies led by Rowland in 2002 and Yadav & Iqbal in 2009 emphasized self-expression, self-esteem, adjustment, empathy, and self-concept to magnify creativity in children. Rowland (2002) also developed a handbook to enable others to replicate this programme in their communities. To develop communication skills in children, Meena (2006) proved Barnlund transactional model of communication on Life Skills to be very operative and long-lasting.

Teaching life skills for student success in life, achieving their personal goals and dealing with employability problems by the youth were focused on by Gamble (2006); Junge et al. (2006); Sterling (2006); Madhu (2008); Bharath & Kumar (2010); Garg (2011); Ozaeta (2011); Kumar & Chhabra (2014) in their study. They threw light on during-school and after-school life skill programmes for children of all age groups to deal with real-life situations and perform functions of age, gender and ethnicity in a much better way. Ozaeta (2011) remarked that integrating meaningful pedagogical methods (in-

school and after-school) with life skills would yield desired results in youth development programs. Bharath & Kumar (2010) investigated the impact of life skill education for empowering adolescents and stressed the integration of Life skill education with school mental health programs, which was again supported by Galagali's article and Kavitha's study in the same year; Nair (2013). Galagali accentuated that life skills education empowers adolescents with both knowledge and skills to deal with the difficulties of daily life, growing up and handling high-risk situations. Nair (2013) analyzed that these skills can predict psychological wellbeing.

Mariachelvi & Jayapoorani (2010) conducted action research to study the impact of life skill training on street children of Coimbatore and noticed a creditable modification in the behavior and knowledge of trained children. Shea (2011) explored the level of Life Skills self-efficacy among students with dyslexia and concluded positive results. Susan & Suprabha (2014) highlighted the need for life skills education for children with special needs and wished for the integration of life skills as a compulsory component of the pre-service teacher education programmes, especially for the teachers of exceptional children. Through her study, Kaur (2019) emphasized the impact of family environment, school environment, and socio-economic status on life skills development among senior secondary school students.

Some researchers tried to analyze the importance of life skills beyond education and other education-related fields, such as Rani (2010), who studied the core life skills from the perspective of Bhagavat Gita. She further pointed that life skills education should be focusing on two goals, i.e. individual perfection and social efficiency. Similarly, Varghese (2010) provided a conceptual analysis of citizenship training and life skills in the Indian context in his study and explained that Life skill education for citizenship was a value addition training for youth to understand self and assess their skills abilities and areas of development. Singh (2014) attempted to underline the seriousness of life skill education in developing entrepreneurship and leadership management skills. The study by Nair & Paul (2010) related life skill education with inclusive growth and opined that life skills are developed due to constructive processing of information, impressions, encounters and experiences- both individual and social.

Awareness of life skills in student teachers and its effect on teaching competencies was studied by Thote (2015), Vijayarani & Geetha (2017). The concluded results of the studies showed that the majority of the student teachers have an average level of life skill awareness, and there is a positive and significant relationship between life skill awareness

and teaching competency. In the same line, Buvaneswari & Juliet (2017) surveyed life skills knowledge in first year B.Sc. nursing students in Tamilnadu. She concluded that most students had average life skills scores. Some researchers, Deshmukh, K.(2014); Meena (2014); Pourjafari (2014); Suresh & Vivek (2014); Bender & Lombard (2015); Kumar (2017); Prajapati et al. (2017), tried to establish a link between Life Skills Training and Emotional, Educational and Social Adjustment of the School and college Children. Results revealed that Life skill training was very substantial for secondary school children in dealing with emotional, educational, and social adjustment glitches.

2.4.1 Studies on Life Skills Education through formal Education System

Botvin (1985) has developed a curriculum based on Life Skills Training Program (LST); the LST program incorporates a curriculum to teach a wide range of personal and social skills to improve youth's general competence and reduce potential motivations for substance use. He reported that by the LST program, a 50% reduction in cigarette use among junior high students significantly impacts the attitudes relating to smoking, alcohol, and marijuana use. The student's assertiveness, social anxiety, self-esteem, decision-making, and social coping skills have also developed by participating in the program.

Hudley & Graham (1993) structured the effectiveness of an intervention program to reduce peer-directed aggression among boys. Results revealed that experimental group subjects were rated less aggressive by their teachers. The study also concluded that in purely theoretical and research laboratories simulation studies of unclear provocative actions, participants were less likely to assume malicious attitudes by peer group.

Morton (1993) studied the effect of a cooperative education program on Grade 12 students. The twelfth standard students were introduced to the cooperative education program for one semester and examined using the Personal Skills Map by Nelson & Law. The study revealed significant improvement was observed in scores of the Interpersonal skills scale and other related life skills. The comparison was made between interpersonal skills scores and career and Life-effectiveness skills and it was found that Interpersonal skills and other related life skills were more improved than Career and Life-effectiveness skills (LKS).

Buhs (2000) evaluated a program related to American Indian Life Skills development curriculum. The program focused on American Indian and Caucasian adolescents and found that there was a change in their self-esteem and depression after the Life Skills Training Course. The pre-test/ post-test of self-esteem and depressive symptomatology

were administered, and a three-month follow up of students was done. Qualitative analysis indicated that the students learned about the areas covered in the training program. Their self-esteem scores increased, and depression decreased between pre and post-test, and again between the post-test and follow up the depression again raised. Students did not learn significantly more about problem-solving, including what to do if in a situation with a suicidal individual. According to statistical analysis, insight ratings indicated that students did not gain insight regarding their emotions, self-esteem, problem-solving and self-destructive behavior up to the required limit.

Baker & Rudd (2001) explored the relationships between critical and creative thinking. According to the provisional result of this research, schools and teachers must start planning a separate curriculum that encourages analytical and innovative thinking. According to this study, the two factors, critical and creative thinking, are not strongly connected. The authors concluded that although critical and creative did not show much relation yet both the thinking styles is in need.

Shechtman et al. (2002) studied the implementation processes and after-results of Life Skills training implemented in Israel's teacher training program. It was a developmental program that focused on Life Skills in four major areas:

1. Social and other relationships and effective communication
2. Personal identity formation or finding one's life's purpose
3. Overall health management
4. Problem-solving or judgement call

Sample for the study includes teacher trainees. Two hundred fourteen teacher trainees were selected as:

1. teachers who did not receive training.
2. teachers in their first year of training.
3. teachers in their second year of training.

Program was implemented and data were collected. Analysis of the data explained that teachers with two years of training had significantly higher skills related to work culture and self-efficacy measures as compared to the teachers who were less number of years in teachers training. The researcher suggested that time duration for teachers training in the program was not much sufficient. It should be increased so as to make it more effective and operative.

West (2003) studied the relationship between Problem-solving Skills and circumstantial variations. The study aimed to analyse the importance of examples and related

experiences in understanding new problems. Researcher tried to understand how individuals learn from examples and retrieve related knowledge from the known problems to understand and resolve new issues. Ninety-four participants from the University of Florida and the surrounding community participated in three studies that employed transfer and similarity-matching tasks. The study investigated the relationship between contextual variability in practice and a training group, given that contextual variability in practice was more likely to solve transfer problems accurately and recognize principles embedded in novel problems than controls. In addition, solvers who did not receive contextual variability in training but solved a simple transfer problem showed improved transfer skills and recognition of embedded principles. It was believed that variation across surface features in situations de-emphasized utility in problems used to categorize and to solve the issues.

Moeller (2005) pointed that authentic learning begins when teachers challenge students with fundamental questions that demand solutions. The author, in this conceptual note, highlighted the importance of different life skills for teachers. It is prerequisite for an effective teacher, to have such qualities. Here, the researcher aimed to help teachers of the next generation develop various life skills, i.e., critical thinking, self-awareness, and practical skills. Moeller believed that anyone could acquire a life-long education from these skills.

Shenoy (2005) studied the high school curriculum and its relevance for developing skills for crisis management. It was assumed in the study that present curriculum is more engrossed with information and conceptual knowledge rather focusing on experiential knowledge and real life situations. This research examined the issues that students face in their daily life and their relation with school curriculum. Sample of the study includes 2457 students, which comprised of 152 teachers,168 parents, out of which 93 teachers and 81 parents were interviewed and observed to collect data. Researcher used a self-prepared questionnaire to seek information from the students. The problems which were highlighted by the students includes academic stress, personal issues, family pressure, school life problems and many more. The researcher analyzed a varied gap between the curriculums followed and curriculum required for developing skills for crisis management. The investigator had designed a model curriculum integrating skills related to crisis management such as skills to understand the issues, the application of related knowledge in different situations, and skills to handle and solve problematic situations,

in different subjects such as Languages, History, Geography, Civics and Economics, Science and Mathematics.

Weerts & Sally (2005) studied critical thinking skills across the curriculum through the films. Researchers used two films for explaining the effective use of critical thinking in real-world problems. Then they offered the questionnaire to the students to answer. The result was that the urgent thinking group project linked the need to teach necessary thinking skills with the desired outcome of improved knowledge of the content area.

Grover (2006) investigated a study entitled "Impact of teacher monitored online instructional program on various Life Skills and academic stress of secondary school students". The study's focus was to study the impact of online instruction with a teacher and without a teacher and conventional instructional methods on Life Skills and academic stress. The sample was 133 students of class ninth from co-educational English medium schools. A pre-post experimental design was implemented in the study. Conventional method was used in the control group and the experimental group was taught through the program. Results showed that students taught through an online instructional package scored higher in various Life Skills, i.e. skill of problem-solving, creative thinking, social skills, acquiring knowledge, communication and decision making, than the students taught through conventional group learning. It further showed that Students studying through online instruction with teaching monitoring, online instruction without teacher monitoring, and traditional group knowledge scored almost equal gain scores on academic stress. The students of three groups perceived equal academic stress. The results of the present investigation indicated that online instructional technology was helpful to enhance the performance of the students in the Science subject at the secondary level compared to the traditional method of teaching. Further, it was suggested that while teaching students through online teacher monitored instructions, control, self-pacing, and flexibility were the significant advantages offered to the learners, which led to propose that such a strategy was more effective than traditional models.

Jones et al. (2006) conducted research entitled "developing an Entrepreneurial Life Skills Summer School". Researchers pointed in the conceptual part that most of the governments in the UK stressed the need and importance of the society rich in enterprising with enhanced entrepreneurial skills. The researchers emphasized introducing more enterprise elements into the school curriculum at all levels. Some of the researchers initiated new and innovative ways to enhance the understanding of the subject matter. According to the study, traditional teaching is particularly equipped to the

requirements of the "old" economic system, whereas the entrepreneurial approach is effectively appropriate to the needs of the highly innovative and mixed economy. The researchers emphasized to develop more number of summer schools which focus on Life Skills with special attention on Entrepreneurial skills.

Wang (2007) carried out a longitudinal study to evaluate the role of oral assessments and group tasks in developing thinking skills among students. Group presentations and other related examination styles were used in the study to enhance critical and creative thinking skills. It was revealed in the study that oral assessments, presentation and group assignments play an effective part in developing creative and critical thinking skills. Further, results of the study indicated that when compared to essay examinations or subject test and multiple-choice tests, presentations and activity assignments augmented creativity as well as critical thinking among students.

Chaudhari et al. (2007) studied various teaching models to develop social skills among students. They found that specific strategies helped develop the ability to interact effectively with others. These strategies includes social skills training program and other skill oriented programs. The effectiveness of these programs repeatedly verified their role in developing a different skills such as interpersonal, social skills and behavioral skills, even in diverse population of children as well as adolescents. It was also beneficial to teachers to teach in meaningful ways that the youth can value.

Quigley (2007) studied impact of Life Skills instruction on the personal-social skills. The study focused on mentally retarded students from rural high school. A holistic and detailed Life Skills programme, focusing exclusively on Life Centered Career Education (LCCE), was incorporated into the curriculum of mentally retarded high school students. The program aimed to study the effectiveness of Life Centered Career Education in developing personal and social skills and occupational lessons related to academics. LCCE Knowledge Battery and Competency Rating Scale (CRS) were the tools used in the study to collect data. Pre-test scores and post-test scores were calculated and compared to interpret the analysis. Scores obtained from experimental group and control group were also compared to study the impact of Life Skills instruction. The results revealed statistically significant difference among the students of both the groups. The findings demonstrate that students in the experimental group did not demonstrate a higher upsurge in Knowledge Battery and Competency Rating Scale scores. Besides that, discussions with the collaborating instructors appear to suggest that if the personal-social skills curriculum was kept going over a longer period of time and given more importance,

the experimental group could presumably achieve statistically significant improvements. Study concluded that although short term program didn't exhibit much improvements nevertheless continued for a session or more would enhance social and personal skills.

Chaudhary et al. (2008) implemented a life skills program on adolescent girls from a low-income group of Vadodara city. A group of school going adolescent girls were given life skill training through action research method. The training includes aspects related to self-awareness, self-esteem and confidence, communication and decision-making skills, and teaching gender awareness and sensitivity. Pre-post experimental research design was adopted in the study. Thirty three girls from a higher secondary schools under the age group of 16-17 years, were considered for the sample. Self-prepared questionnaire having open- and close-ended questions was considered as tool for data collection. Prepared Questionnaire focused on aspects like self-concept, self-esteem, decision making, gender awareness and assertive communication. Intervention program was implemented for a week and data was collected before and after the intervention to study its effectiveness. It was analysed that within a week, participating girls exhibit remarkable improvement in level of understanding. Authors concluded that girls of the experimental group grasped the concept of communicating effectively and recognised the distinction among hostile and robust communication. The programme developed an account of gender specific socialization practices that influence accountabilities while limiting progress and self-growth.

Emeka (2009) studied the impact of teaching learning of life skills on the students with emotional disabilities. Researcher used music to teach life skills to the students. According to researcher American youth is more absorbed in hip-hop culture such as songs, raps, miming, lyrics, dressing and musical rhythms, so used such music to teach life skills. According to the investigation, acknowledging students' cultures, instructional necessitates, and styles, as well as using such knowledge on the subject to educate them, is always essential. The author's special education classroom's desire for modernization and leadership initiatives precipitated the use of hip-hop music to teach Life Skills, reading, and other functional skills in the school. Study sample includes American youth from public schools who were facing emotional disabilities. The strategic approach in the form of instructional curriculum used by the researcher in the study intended to increase students' supportive and positive ability to participate in every activity and encourage school enrollment. The students' and teachers' reactions were both awe-inspiring. To achieve academic achievement, it was suggested that interested teachers

develop and implement resourceful and creative pedagogical practices, instructional approaches, and effective educational management practices. The results revealed that such instructional teaching learning methods develop good behavior among students, assist them in dealing emotional regulation, and motivating them to engage in all the activities in the classroom

Lineo (2009) had conducted a study on the impact of life skills on adolescents by analyzing the seriousness of Life Skills education in improving all parameters of quality education. The study highlighted the significance of life skill education in satisfying the needs and demands of the goal of Education for All and other related Millennium Development Goals (MDG). The study pointed to report development problems such as poverty reduction, preventing the spread of HIV/AIDS and alcohol and drug abuse and effectiveness of life skill education in dealing with such issues. The study examined the implementation and evaluation of Life Sill programs at Primary schools, Secondary schools and institutions of higher learning. The sample includes policy-makers from the Ministry of Education and Training, Deans of the Faculty of Education, and other stakeholders of education system such as principals, education officers and curriculum developers. The study focused on relationship between Lesotho education system and life skill education. Document review and their analysis along with interview schedule were data collection tools. The collected data was qualitative. The results demonstrated a number of issues and opportunities related to analysis and evaluation of such initiatives, performance and teachers' capabilities for teaching learning of life skill program, were the hurdles in implementing life skill education. Open and Distance Learning mode was the most appropriate option suggested by the author for the effective implementation of the life skill education in Lesotho.

Malayankandy & Usha (2009) suggested that integration of life skill components in regular school curriculum empower young generation in meeting the needs of challenging situations and combat emotional and mental stress. Further, they pointed out the relevance of hands-on experiences and participatory approach in teaching learning of life skill education. It was observed by the authors that content writers for the curriculum and textbooks should incorporate elements of life skill in regular textbooks as well as in supplementary reading materials to enhance the effectiveness of such material.

Alias & Hadi (2010) accomplished a study to determine the relationship between post-secondary vocational students' creative and critical thinking styles and academic achievements. The data was collected on thinking styles through The Malay translation

of the Yan Piaw Creative - Critical Thinking Styles Test, and the Test-retest reliability was based on 0.89. Four community colleges registered with the Ministry of Higher Education were selected as a sample of the study. One hundred nine students studying work-based diploma programs from these selected colleges were considered as a sample of the study. Twenty-five students from Hotel and Catering, 34 from Electrical Technology, 30 from Computer Technology and 20 from Automotive Technology were considered for the study. The results showed that most vocational students have a stronger predisposition towards creative thinking (59%). According to the findings, thinking style is positively correlated with academic success among post-secondary students of vocational courses. However, it has been discovered that thinking style is positively correlated with academic success and creativity. The authors also concluded that male and female students have a similar preference in their critical and creative thinking styles yet there was no link between thinking styles and gender.

Helaiya (2010) studied developing and implementing a life skills program for student teachers. The study's primary objectives were to create the life skills program, determine its effectiveness, and know their opinions about the developed Life Skills program. The research was Experimental design and selected sample of 25 student teachers having commerce method of the Department of Education, Faculty of Education & Psychology, The Maharaja Sayajirao University of Baroda, Vadodara, during the academic year 2008-09. Situational Tests, life skills inventory, activities feedback sheet, program feedback Sheet, field Notes, focus group discussion and participatory observation were the tools used for the study. The data collection was analyzed qualitatively technique and content analysis used for data analysis. The Life Skills program was found effective for student teachers. Out of 21 student teachers, 17 lacked self-confidence or possessed negative thoughts regarding their life, and 14 student teachers were weak in decision making and problem-solving skills. The results revealed that they improved in self-awareness, self-confidence, and self-dependence. Reduced stress and agility was noticed among the experimental group.

Singh (2010) in her article, entitled as, "Life Skills for Enhancing Excellence in Education and Life-Long Learning", attempted to study one of the most important attempt to encourage skill-based learning in regular curriculum by National Institute of Open Schooling (NIOS). NIOS, on pilot basis, incorporated life skill training with regular school curriculum. Singh has stated that the technique has established a solid model for the development of child as well as effectiveness of the subject. The very first stage,

according to Singh, was to incorporate life skills and adolescent reproductive and sexual issues into the education system. The final stage was to sensitize the instructional editors about childhood and adolescence issues and strengthen their competencies by empowering them to use the life skills concept while working to develop the lessons after reviewing and evaluating the curriculum about the need to consolidate life skills into the subject.

Geeta (2011) revealed that the intervention program used for developing life skills among dyslexic students was very effective. The researcher implied a self-made intervention program as a treatment tool and includes activities, expert lectures and short term projects. Pre-Post control group design was used in the study. It was highlighted by the researcher that the intervention program was statistically found to be effective in terms of improvement in life skills among dyslexic students.

Mohamad & Heong (2011) carried out a study to understand the association of students' learning styles and problem-solving skills. The study was executed on the students of Building Construction Course at Vocational School. A survey was carried out in two vocational schools that have Building Construction courses in their curriculum. Sixty-eight vocational students from this course were studied to understand the relationship between learning styles and problem-solving skills. Findings of the study revealed that mostly Input style was more effective on students of building construction, when compared to the learning styles. Furthermore, authors pointed the dominance of trickery, suggestions and idea modifications as the elements of creative thinking for analyzing and solving any situation.

Pereira & Krishnan (2011) analyzed the Life Skills of secondary school students in Kerala. A normative survey was used to collect data, and the sample consisted of 230 eighth and ninth standard students of eight CBSE schools selected through a random sampling technique. The tool used for data collection was the Life Skills attribute schedule covering four areas decision-making skills, problem-solving skills, critical thinking skills and stress management skills. The results revealed that above-average levels of Life Skills were present among the CBSE secondary school students; gender does not influence students' Life Skills. The students from the rural area had more Life Skills than those from urban areas. There was a significant difference between the Life Skills of secondary CBSE students who learned through activity-oriented and conventional lecture methods of instruction. The students who receive activity-oriented

education showed more life skills than students who receive traditional lecture teaching methods.

Vallotton & Ayoub (2011) investigated a study entitled the role of gestures and words in developing life skills and social-emotional concepts during toddlerhood. Data was collected from one hundred eight children and mothers. Children comprising the sample group were in the age bar of 14-36 months. To develop life skills among such a small age children, children's gestures and words and expressions practiced during their interactions with mothers were used as a medium of instruction. These instructional tools were also employed as a symbol skill indicator to analyse the children's abilities and their socio-emotional skills. It was concluded in the study that social skills and symbol skills have a positive co-relation with children who were in middle childhood. Further, the research reported that these skills were not much apparent in early age children who were newly verbal and didn't developed much communication gestures. Words had a greater impact on life skills, as suggested in different growth models, whereas initial expression or symbols reflect project later connections between social and emotional perceptions. As a result, even in early stages of development, symbols serve as a means of connectivity and mental tools for understanding the social-emotional world. Further, it was suggested in the study that representations were recommended to be both tools for engagement and intellectual instruments for consciousness.

Johnson (2012) investigated the life skills of teacher educators in the Puducherry region. The sample for the study was selected purposively and almost one hundred and fifty teachers trainers from different teacher training colleges across Puducherry were considered for sample. Questionnaire was developed by the researcher to collect data. The findings of the study revealed that Social skills such as communication and inter-personal relationships were well-developed in teacher educators. Workshops and skill trainings will effectively impart life skills training to teacher educators, according to nearly 54.4 percent of teacher educators. The findings also revealed that the level of awareness of skills such as negotiation and thinking skills were significant yet some skills like coping skills were found to be low in awareness.

Jeena (2013) undertook a study titled, "development of life skills through select pedagogic strategies among higher secondary school students". The investigator tried to develop life skills with the help of teaching learning yet some innovative methods, among students of higher secondary school. For data collection, the investigator took the help of a life skill inventory, environmental awareness test and questionnaire. Pre-post-test

nonequivalent control group design was used by the investigator for the research methodology. The findings revealed that the majority of the teachers of higher secondary students support the development of life skills among students. They also opined that it is tough to develop life skills and heavy workload; most teachers also claimed that the lack of specific curriculum, instructional material, and time impeded the programs for developing life skills. The result of the pre-test post-test showed the life skills component, i.e. self-awareness, showed a significant difference in the retention capacity. In contrast, the component empathy showed a highly significant difference among the control and experimental groups for the post-test. The composite score on life skills portrayed a highly significant difference among the experimental group, and it is an advantage to the experimental group.

Rajeswari (2014) aimed to study the teacher effectiveness about Life Skills at Secondary school students of Thiruvananthapuram and Kollam district. The researcher attempted to understand the relationship between teacher effectiveness and life skills. Life skill acquisition test and teacher effectiveness rating scale were the tools and techniques employed during the study, to measure teachers' effectiveness in life skills. The findings revealed statistically significant relationship was found amongst teacher effectiveness and life skills.

Tariq (2014) carried out a study to assess the life skills of teachers' readiness for their role. The study's objective was to evaluate perception of life skill teachers regarding teaching learning of life skills in primary schools of Oman. All the life skill teachers servicing at second cycle of the preliminary stage, were considered as sample for the study. The study was descriptive survey and used questionnaire to collect data from the teachers. Survey in the form of Questionnaire was divided into two sections with number of subsections. Two sections of the questionnaire were demographics and measures of perception ability which were formulated on five-point Likert type rating scale. Second subsection was further divided into six sub-sections based on sub-scales of perception scale include- planning, Execution, Assessment, technical content, vocational counselling, and administrative duties. The Questionnaire has 53 items based on life skill teachers perception and their level of ability in dealing students while teaching life skills. Data was collected through survey. The analysis results showed life skills teachers remarked themselves as being able and competent enough to handle and deliver all the skills covered in the sub-sections of the questionnaire. Further, it was revealed by the participant teachers that, they feel less skilled in some of the vocational counselling,

technical content related to life skills, skills related to knowledge integration and communication while teaching life skills in the class.

Parvathy & Pillai (2015) carried out an experimental study to analyze life skills among adolescents. The investigator also studied the implications of life skills training on the knowledge level of adolescents. The study was conducted in a rural coastal area school in Karunagapally, Kerala, India. The background of the study was related to the Life Skills like coping with difficulties and problems that adolescents face during their personal, emotional and social development. Being an experimental study, it involved pre-test and post-test research design. Sample consisted of 57 adolescents and among them, 30 students were considered for experimental group and 27 for experiment-delayed group. Almost similar results were shown by both the groups in terms of social and demographic status. Statistically significant impact of life skill training was observed by the researchers in experimental group.

Khirwadkar & Eisha (2016) through an article, "Amalgamation of Life Skills and Education", particularize the notability of life skills in the education system. The article zero in on some of the contextual points related to life skill education, proving its need-based and far-reaching place in the education system at all stages. In the article, researchers tried to develop a relationship between life skill education the formal education and relate its importance at all the stages of child development, specifically at the adolescent stage. The researchers also tried to throw attention to the efforts taken by different educational bodies to introduce life skill education in formal educational settings.

Purohit (2016) worked on coping skills for the 21st-century at the secondary school level. Through educational activities, the study tried to explore coping skills for 21st-century secondary students. The objectives of the study includes analyse different coping skills for 21st century and develop as well as implement educational activities to explore them in secondary students. The investigator used a semi-structured interview schedule, brainstorming sessions, focus group discussion, field notes, observation schedule, and field diaries on collecting data. In his study, the investigator pointed out a few challenges (faced by students in daily school routine) such as the absence of creative culture, parents and peer pressure for high achievement, underestimation of children's abilities, and lack of bonding between students and teachers. The findings of the study were: All the students were found to have manageable communication skills, found Skills of collaboration and sharing responsibility, among most of the students, most of the students

lacked in media management skills and fellow feelings, few of the students exhibit social responsibility skills and inter-personal awareness. The study also reported the presence of self-directional skills among the majority of students, problem-solving skills and research skills.

Pandya (2019) developed a tryout module on some selected life skills for pre-service secondary student teachers. The researcher prepared life skill modules for student teachers and studied the effectiveness of modules of life skills about gender, qualification, marital status and caste among pre-service secondary student teachers. Tools include Life Skill Scale, Situational Test, Creative Thinking Test, Focused group discussion, Student diary, Researcher diary, Feedback sheet. Quantitative data was analyzed through mean, standard deviation, and t-test. Frequency and percentage were used for the researcher's journal, student's diary, group discussion, and feedback sheet for qualitative data. The study concluded with the following points: gender, qualification, marital status, and category difference did not affect communication skills, awareness skills, interpersonal relationship skills, creative thinking skills of student teachers. The study also emphasized that:

1. the confidence level of student teachers was enhanced,
2. thinking power and opportunity to brainstorming was also developed, classroom atmosphere became joyful and lively,
3. developed critical thinking, reasoning ability, and problem-solving ability among student teachers.

Srivastava (2019) highlighted the importance of life skills and digital competency in teacher education through "Digital Competence and Life Skills: A Study of Higher Education Teachers". The researcher also designed a MOOC for enhancing life skills through DIGICOMP in higher education teachers. Digital Competence (DIGICOMP) Assessment Questionnaire and Life Skills Assessment Scale were used for data collection. Significant findings of the study were:

1. intermediate level of digital competence was found in higher education teachers.
2. higher education teachers have a high level of collaboration skills.
3. moderate level of effective communication, creative thinking and critical thinking skill,
4. higher education teachers of the private university have high practical communication skills and collaboration skills and good creative thinking and necessary thinking skills.

2.4.2 Summary

The third category of literature review includes work related to life skill education imparted through formal education or in a proper school setting. Under this section, The researcher reported 35 studies out of 42, which were reviewed in all. Studies focusing on life skill education and daily school curriculum were mooted in this section.

Curriculum-based on life skill education for students was first developed by Botvin (1985) to teach a wide range of personal and social skills during one of his studies. The study concluded that students' confidence, anxiety, self-esteem, decision-making, and social coping skills were strengthened. The results were supported by Hudley & Graham (1993); Morton (1993); Buhs (2000); Baker & Rudd (2001); Weerts & Sally (2005), who worked on studying the effectiveness in intervention programs embedded in the school curriculum and found positive results. Baker & Rudd (2001); Shenoy (2005); Alias & Abd Hadi (2010); Mohamad & Heong (2011) prepared a specific curriculum that separately targets and enhance problem-solving skills, creative and critical thinking. Weerts & Sally (2005) employed films as a tool for refining necessary and creative thinking skills in students. Shenoy (2005) designed a model curriculum for most subjects and tried to integrate different skills to understand real problems and apply that understanding to find proper solutions.

West (2003) studied the effect of practising a single skill, i.e. problem-solving skill, on university students. The researcher used different problems and examples to make students' understand problem-solving skills through these examples and learn to solve new ones. Similarly, through his study, Moeller (2005) tried to develop different life skills in students, specifically critical and creative thinking, through questioning concepts. He observed that authentic learning begins when teachers challenge students with fundamental questions that demand solutions. In the same line, Wang (2007) tried to develop creative and critical thinking skills, in students of secondary school, with the help of oral assessments, presentations and group assignments. Chaudhari, Vaidya & Mahapatra (2007); Jeena (2013) studied the effective development of Life skills, especially social skills and interpersonal skills, among students through different teaching methodologies.

Similar studies have been conducted by Chaudhary et al. (2008), Lineo & Kolosoa (2009), Malayankandy & Usha. A. (2009) on adolescents. They argued in their study that the introduction of Life Skills education at primary and tertiary education was determined to improve all aspects of quality education. In addition to facilitating Education for All

(EFA) and Millennium Development Goals (MDG), promoting effective learning. In their study, Vallotton & Ayoub (2011) use gestures and words to blossom life skills and social-emotional concepts for toddlerhood.

Alias & Abd Hadi (2010); Mohamad & Heong (2011) considered post-secondary vocational students experimental groups. The studies revealed that creative and critical thinking and different problem-solving learning styles predominantly affect academic achievements among post-secondary vocational students. A study by Jones, Brian, Iredale & Norma (2006) studied entrepreneurial Life Skills and suggested a great demand for an advanced education system that could equip students with enterprising skills and the life skills to help deal with this demand. The discourse by Singh in 2010 on life skill education and life-long learning strengthens the above point. The researcher recommends through the study analysis that the integrated curriculum would be an appreciable step for a strong foundation of education.

Geeta (2011) tried to provide intervention programs to dyslexic students and observed optimistic outcomes. The program includes different activities, expert lectures and short term projects. Quigley (2007) developed personal and social skills among rural high school students with mental retardation. The researchers integrated the Life Skills program, Life Centered Career Education (LCCE), into the students' curriculum. The results indicated that the integrated curriculum was very effective in reinforcing and developing these skills among students. While analyzing the effect of exercising music for teaching learning of Life Skills to the students with emotional disabilities, Emeka (2009) observed appreciable success. Grover (2006) dealt with growing depressive symptoms and academic stress in school-going children. They developed a school-based universal program based on life skills for adolescents to empower and foster their practical thinking skills, ultimately tackling their aggressive and depressive behaviour. Grover (2006) developed online instructional technology to teach life skills to enhance the performance of students. The researcher suggested that self-pacing and flexibility were the significant advantages offered to the learners in this teaching-learning method.

Shechtman, Levy & Leichtentritt (2002); Helaiya (2010); Johnson (2012); Khirwadkar & Eisha (2016); Pandya (2019) put their efforts on highlighting the seriousness of life skills for students as well as in teachers' training via their study. The studies concluded that enough time and craft integrated curriculum should be given for the training of teachers and educators. Rajeswari, K (2014); Tariq (2014) studied teacher effectiveness concerning Life Skills at the Secondary level and realized the efficacy of life skills for

students at this age. In her study, Rajeswari threw light on the necessity of life skill education for teachers. Similarly, Tariq (2014) also quoted the readiness of teachers' for their new addon role of life skill teachers. Tariq observed that most life skill teachers perceived themselves as less competent while delivering life skill training to the students due to a lack of proper training.

Pandya (2019) prepared a module for pre-service secondary student teachers based on selected life skills and looked into its effectiveness. The concluding remarks were: confidence level of student teachers was enhanced, thinking power and opportunity to brainstorming was also developed, classroom atmosphere became joyful and lively, developed critical thinking, reasoning ability, problem-solving ability among student teachers. Working in a similar line, Srivastava (2019) analyzed the relationship between life skills and digital competency in teacher education. The researcher also designed a MOOC for enhancing life skills through Digital Competency (DIGICOMP) for higher education teachers.

A normative survey was carried out by Pereira & Krishnan in 2011 to know the presence of life skills in students of CBSE secondary school. The results revealed that above-average levels of Life Skills were present among the CBSE secondary school students. The students taught through activity-oriented teaching-learning processes showed more life skills than students taught through conventional lecture methods of instruction. Likewise, Parvathy & Pillai (2015), Purohit (2016) surveyed academic and life skills among students at different age groups and reported optimistic conclusions. Purohit (2016) also said the company of self-directional skills among most students, problem-solving skills and research skills. Still, with some extra efforts in life skill training, students could refine these skills.

2.5.1 Studies on Life Skill Education through Different Subjects

Kumari (2002) studied the development of Life Skills with Mathematical education. She revealed that mathematical abilities like exploring, conjecture, reason, and communication were needed in every field of life due to the technological revolution. The problem-solving situations were a viable medium to link mathematics with Life Skills, such as the problem-solving behavior of students. The researcher concluded that middle-class students had developed problem-solving skills by learning mathematics, and students were using this skill to deal with real-world environments and experiences.

Shin & McGee (2002) investigated the use of inquiry-based multimedia learning environments to enhance problem-solving skills among students specifically girls from

9th standard of the astronomy course. A pre-post experimental research design was used in the study. Self-prepared questionnaire with open ended and close ended questions, contributed as tool for data collection. Questions were mainly based on content understanding and problem solving skills. Findings of the study revealed that multimedia learning based on inquiry skills was validated as effective as well as experiential in developing problem solving skills among students. Content knowledge was also improved through such technique of teaching learning, as suggested by the study results.

Moffett (2005) worked on physically challenged students. Researcher implemented 24 session program in 12 weeks on physically disable children of 10-19 years age. The program was developed considering the elements such as goal setting, positive self-talk, assertiveness, optimism, social skills, and coping skills, taken from sports and life skills. A pre-post control group research design was employed in the study. The intervention was given while playing soccer and taekwondo. Twenty-one students were considered for experimental group and 25 for control group. Effectiveness of the Sports and Life Skills program was examined with the help of Life Orientation Test-Revised, the Disability and Sport Coping Survey, the Self-Perception Profile for Children and parent along with child interviews. Pre-test was compared with post-test to understand the retention of the skills in experimental group students. It was highlighted in the findings that Experimental group showed statistically significantly improvement in coping skills, athletic perceived competencies, and general self-worth when post-test of the experimental group was compared to the pre-test as well as with the post test scores of the control group. However, it was also mentioned that the retention abilities were not much satisfactory in general self-worth and athletic perceived competence among students of experimental group. Further, analysis of the qualitative data explained that experimental group retained their knowledge of the skills after the intervention, also.

Vashista & Bhardwaj (2006) in their study they identified the Life Skills relevant to science and technology as per the preference of boys and girls of secondary school and also they analyzed the achievement of science and technology. The sample consists of 100 students, comprising 64 boys and 36 girls from class eight of various schools. A self-constructed tool has been employed. Chi-Square was the statistical technique used to analyze the data. The outcome revealed that problem-solving skills were the dominant skill compared to other skills, whereas interpersonal skill weighs the least. Researcher stresses including the LSE approach in the curriculum framing and also in the classroom.

Gafoor & Shemi (2007) analysed the impact of study skills training on achievement in the biology among the students of standard eighth. The study results showed positive results in favour of using study skills in the subject of biology. The study aimed to test the effect of study skills and training on the biology achievement of standard eighth students. The sample was 128 students from standard eighth. Sixty-four students formed the experimental group, and the same number formed the control group. There was a marked effect on Achievement in Biology in the study skills trained group due to study skills training in the total sample. The same result was obtained from the analysis of sub-samples based on gender and levels of achievement. The percentage of mean post-test scores of study skills trained group and control group in total sample and subsample, 10-18% of the accomplishment in Biology of standard eighth students was observed. Students and teachers highly appreciated the effectiveness of study skills training in improving learning skills. It was instrumental in enhancing achievement as its effect is highest in low achievement strata. However, high achievers and average achievers also are supported by it in improving their learning skills. The findings suggested that study skills were positively related to academic achievement. The development of study skills will remain important in advancing students' academic, personal and professional success. By providing proper assistance and guidance, low achievers and average achievers can improve their academic performance. In the teaching process, if teachers took the responsibility of equipping students with essential study skills, students would become independent learners to a great extent. At least a few hours in every term should be set apart to develop newer techniques and skills which will make the learners better in learning and achieving.

Christane (2008) investigated the impact of the awareness training model of teaching in life science to develop creativity among pupils. The study was conducted to reveal the effects of the awareness training model of teaching in life science to develop creativity among pupils. The aim was to evaluate the significant difference between the effects of the awareness training model and the traditional method of teaching life science in the development of students' creative thinking ability. It constituted 120 students of class IX of two different schools, of which 64 were girls, and 56 were boys. It was found that the experimental group taught through the awareness training model of teaching obtained significantly higher post-test academic achievement scores than the control group. Moreover, the gain score of the experimental group in creativity was also higher than the control group showing that teaching through awareness training model was proved to be

better than the traditional method of teaching in achieving creativity and academic achievement.

Pany (2008) studied the effectiveness of Synectic's teaching model in enhancing creativity, academic achievement and achievement motivation of learners. The study was undertaken with the objectives:

1. to study the effectiveness of the Making Familiar Strange (MH) approach of Synectic's model of teaching on the development of learners' creative thinking ability,
2. to study the impact of the MFS approach of Synectic's model of teaching on the development of learners achievement in the subject of general science
3. to study the effects of the MFS approach of Synectic's teaching model on achievement motivation of the learners.

The investigator of the study followed the nonequivalent, control group design of quasi-experimental type. For experimentation, two primary schools of Bhubaneswar city, having an almost similar facility, were randomly selected out of four identical kinds of schools about their management, infrastructural facility, teacher and student strength. All the 35 subjects of the experimental group and 36 control group subjects were subjected to 18 lessons on General science. The investigator himself taught the experimental group by following the MFS approach of Synectic's model of education. In contrast, the control group was led by their regular class teacher by following the traditional teaching method. The subjects of both the groups were pre and post-tested on all the dependent variables such as; creativity, academic achievement and achievement motivation. The pre-test scores of the control and experimental groups were almost equivalent when tested for their normality of distribution. As such, all the hypotheses were tested applying the t-test statistical technique. The study's significant findings suggested that the Making Familiar Strange (MFS) approach of the Synectic model of teaching was found effective in enhancing the creative thinking ability of the learners. The MFS approach of the Synectic model of education did not prove to be effective in improving the achievement motivation of the learners. The MFS approach of the Synectic teaching model did not significantly impact the learners' achievement in general science.

Thurman (2009) investigated South Dakota English content instructors' emphasis on teaching critical thinking skills at the high school junior and senior level and the college freshmen and sophomore level by examining instructors' perceptions. A survey was developed based on three essential aspects: information concerning the importance of

teaching critical thinking skills, obstacles to teaching necessary thinking skills, and training modules for teaching critical thinking skills. The criteria for the investigation in terms of achievement in differences in perception was based on different aspects such as the number of years as teaching experience, highest degree earned, level of teaching, and average class size. The study participants favorably recommended incorporating critical thinking skills and self-confidence as their essential elements in teaching life skills. Following the results of the study, South Dakota public high school and college English content instructors incorporate critical thinking into their lessons. Teachers with countable teaching experience generally believed they had received training in teaching and developed necessary thinking skills during their teacher education programs considerably than those with limited teaching experience. Instructors who had been actively involved in courses focused on professional development for two years developed their abilities to teach critical thinking skills. Furthermore, fewer respondents intimated that they were provided feedback on their ability to teach critical thinking skills due to performance evaluations. However, the number of instructors varied in their beliefs related to the obstacles while teaching important thinking skills. English teachers from High school junior/senior pointed few obstructions in teaching necessary thinking skills such as class size, lack of time management and pressure to improve scores on standardized tests. In contrast, first-year college students/sophomore English instructors identified a lack of knowledge or understanding of critical thinking, class size, and limited professional development opportunities in critical thinking as the most significant obstacles.

Venkatesh (2009) studied the effectiveness of life skill education on attitude, self-concept and problem-solving ability in mathematics. The primary objectives of the includes, to study the effectiveness of Life Skill Education on Attitude, Self-Concept and problem-solving Ability of students of the ninth standard, to find the difference if any, between the effect of Life Skills Education on nine standard boys and girls, on their Attitude, Self-Concept and problem-solving Ability. The researcher prefers to use a randomized pre-test post-test design for the study with a stratified random sampling procedure. It was concluded in the study that, Life Skills education has a positive effect on the students' Attitude, Self-Concept and Problem-solving Ability in Mathematics of experimental group students.

Laleman (2010) studied the influence of Life Skills modelling through literary connections on English class students' academic success levels. This was measured

through observation, journaling, and surveying a class of tenth grade English students. This study showed solid and relational connections to the text, but no accurate measure of higher academic scores was noted. Measuring how much students related to text through Life Skills connections was challenging to measure in a "paper and pen" process. Although direct numerical data on whether or not academic scores raised in correlation to Life Skills application through literature is practical, deep critical connections were apparent in the research.

Strom (2010) utilized the California Critical Thinking Skills Test to measure the improvement in critical thinking skills that students obtained through a traditional 'seat bound' versus a 'performance-based approach with respect to the teachings of Shakespeare at the secondary level. The research intended to analyze whether there would be a statistically significant difference between the two. Based on the teacher's methodological approach, two samples were selected. one sample includes students who had learned the performance-based approach in the Folger Shakespeare National Endowment for the Humanities Summer Institute on the teaching of Shakespeare. The second sample group was a National Board Certified instructor who employed traditional seat-bound methods. There were ninety participants between the two classes involved in a four-week unit on a particular Shakespeare play. The study focused on four specific points for data analysis. These were:

1. overall gains in critical thinking after studying Shakespeare,
2. differences in essential scores of thinking between the control and experimental groups,
3. the impact on the specific critical thinking ability of Inferencing between a performance-based versus seat-bound approaches,
4. the role of gender plays in determining the growth of necessary thinking skills between both groups.

Control group students were traditionally taught Shakespeare; experimental group students received the treatment of a performance-based approach. All subjects were given a pre and post-test. Students who learn Shakespeare through a performance-based process showed statistically significant improvement in overall critical thinking skills. It was analysed further that boys, in particular, developed more thinking skills through this strategy when compared with girls. The study highlighted the benefit of a performance-based system in the teaching of Shakespeare at the secondary level.

Zimmerman (2010) in a case study, concluded that project-based learning (PBL) in twelfth-grade social studies classrooms contributed to life skills development for high school seniors in this advanced and globalized time. This research investigated student experiences with PBL methods for helping them acquire skills along with a case study of a successful PBL program. The purpose of this study was to help educators discern the value of this instructional strategy. The tool used for the analysis was an interview schedule. The sampling was convenient as three teachers who agreed to participate in the study were considered as a sample. The selected teachers created a unique PBL program in their high school classrooms. The focus of their work was to document the success in teaching Life Skills to high school students to prepare them for college, jobs, and life after secondary education. Information was also gathered by observing the teachers as they worked actively with students using PBL. The major themes found within the literature highlight the success of the project-based learning method. It was concluded that the PBL method successfully taught and built Life Skills in high school social studies classrooms and prepared students for life after secondary education better.

Malhan (2011) investigated the effect of a hybrid instructional model in a cooperative learning situation on the Life Skills of secondary students about learning approaches. A self-made Hybrid Instructional Module in science for secondary students was developed and validated by the researcher in the study. The researcher's objective was to study the impact of the hybrid instructional model in cooperative learning situations on life skills. The study was designed with an experimental method (Pre-test Post-test control group design), and sampling was done using random samples at two levels, i.e. school and student. It was analyzed in the study that hybrid instructions in cooperative learning situations may be used to enhance the performance of the students in science at the secondary level and found to be more effective than collaborative learning and traditional method of teaching.

Tingen et al. (2011) remarked that Classroom Web sites could support and enhance student learning by targeting 21st-century skills, such as collaboration among teachers, students, parents, and other teachers, media literacy, and interpersonal and self-directional, as well as thinking and problem-solving skills. Web 2.0 tools such as blogs, wikis, and podcasts enhance teacher websites to prepare students for the future. By making learning a social event, teachers help to keep students engaged with course material. In addition, teachers are supporting 21st-century skills by posting student work so that classmates may comment on and refine one another's products. In this paper, the

authors report on their study of classroom Web sites to determine whether they specifically support 21st-century skills. Preliminary findings suggest that classroom Web sites are not meeting the needs of 21st-century students. Additional findings highlight that most classroom teachers are self-taught in terms of Website development. Based on their results, the authors developed recommendations for educators who want to produce a classroom Web site aligned with the standards for learning in the 21st century.

Bindu (2015) developed a teaching-learning package in biology based on react strategy. The package was designed to enhance life skills among secondary school students. The study's main objective was to determine the effectiveness of contextual teaching learning package in biology based on React Strategy; to assess the level of life skills of Kerala secondary school students and awareness of secondary school science teachers. The significant findings revealed that secondary school students' life skills were below average; secondary school science teachers are intermediate in their awareness of Contextualization of science teaching-learning.

2.5.2 Summary

In this literature review segment, the researcher recounted those studies related to teaching life skills through different subjects. In total, 14 studies were reviewed under this section. The reviewed literature in this section includes studies highlighting the success of amalgamation of life skills with the subjects in the school curriculum.

Kumari (2002) and Venkatesh (2009) tried to teach life skills along with mathematics education. Different life skills such as problem-solving and communication skills could be easily brushed up in middle-class students through mathematics, as Kumari (2002) reported in her masterpiece. Venkatesh (2009) studied the effectiveness of life skill education on attitude, self-concept and problem-solving ability in mathematics and concluded remarkable results. Likewise, Shin & McGee (2002) took the help of an inquiry-based multimedia learning environment in astronomy class for ninth-grade students to boost their problem-solving skills. Constructive results were concluded after the study. In one more study in a similar line, Gafoor & Shemi in 2007 investigated the impact of study skills on the achievement of biology subject. The researchers used study skill training to make students understand biology more interestingly. The significant findings include: study skills were positively related to academic achievement, and the development of study skills will remain important in advancing student's academic, personal and professional success.

Different researchers employ different methods during their teaching-learning process to instigate other skills needed for their successful life and Academic Achievement. The researchers, namely, Christane (2008); Pany (2008); Thurman (2009); Zimmerman (2010); Malhan (2011); Bindu (2015), make use of different teaching models for developing other skills in students through various subjects. Christane (2008) reported the impact of the awareness training model of teaching in life science to develop creativity among pupils. Pany (2008) studied the effectiveness of Synectic's teaching model in enhancing creativity, academic Achievement and achievement motivation of learners. Zimmerman, in 2010 implemented the project-based learning (PBL) method in twelfth-grade social studies classrooms to improve life skills. Malhan (2011) employed a hybrid instructional model in a cooperative learning situation for enriching Life skills in secondary students. The researcher's objective was to study the impact of the hybrid instructional model in collaborative learning situations on life skills. Analysis of the results validated the effectiveness of mixed instructions in a cooperative learning situation for developing life skills among secondary school students. Bindu, in 2015 created a package for biology subject based on react strategy. The research focused on the effectiveness of contextual teaching learning package in biology based on React Strategy and assessing the level of life skills of secondary school students as a significant objective. Analyzed data revealed, the developed package was helping students in better understanding. It was also revealed that secondary school science teachers are average in their awareness of the Contextualization of science teaching-learning.

The effect of life skills and life skill education in different subjects was also studied by some researchers such as Laleman (2010); Strom (2010), Thurman (2009); Vashista & Bhardwaj (2006). Laleman (2010) study focused on life skill modelling through literary connections on student academic success levels in English class. Strom in 2010 made use of the California Critical Thinking Skills Test to measure the progress in critical thinking skills after experimenting with 'performance-based approach to the teaching of Shakespeare at the secondary level and found significant improvement in overall critical thinking skills. Thurman (2009) surveyed to obtain information concerning the importance of teaching necessary thinking skills, preparation for critical thinking skills, and obstacles to teaching essential thinking skills for English content instructors. The study's concluding remarks were not much positive. The researcher remarked that English instructors identified the most significant obstacles to the lack of knowledge or

understanding of critical thinking, class size, and limited professional development opportunities in critical thinking.

Going one step forward, some researchers used different tools for making teaching-learning more exciting and understandable. Tingen et al. (2011) use websites to support and boost students in their learning process. According to Tingen et al. (2011), "Classroom Web sites have the potential to support and enhance student learning by targeting 21st-century skills, such as collaboration among teachers, students, parents, and other teachers, media literacy, and interpersonal and self-directional skills, as well as thinking and problem-solving skills". Moffett, in 2005 integrated life skill education with sports and tried to help physically challenged students and provide extended support in the form of a 12-week, 24-session sports and Life Skills intervention program to make them more empowered. Analysis of both the data, quantitative and qualitative, highlighted the importance of an intervention program.

2.6.1 Studies on Teaching-Learning of Science and Technology

Vardhini (1983) through a study on the Development of Multimedia Instructional Strategy for Teaching Science (Physics and Chemistry) at Secondary Level, showed that the strategy was valid against the criterion of scientific attitude. In that, significantly higher performance was noted for the group in the post-test over the pre-test. Usage of the strategy presented a significant relationship between intelligence and achievement, and a meaningful relationship was found between scientific attitude and achievement for the experimental and control group. Visual projections with teacher explanation and those with taped commentary were equally effective in terms of achievement. Programmed material and discussion sequence were similarly effective on the actual test. The strategy was found feasible in terms of its reproducibility and the cost management by individual schools.

Anjaria (1984) explored the use of the Systems Approach in the Teaching of Science to prepare an instructional model with the help of resources for the unit on Light in Std. X. Study aimed to measure the effectiveness of the systems approach in the teaching-learning process and in planning the design of the experiment. The study claimed that the systems approach to instruction was more effective than the traditional approach to education as the experimental group scored higher than the control group. Further, regarding retention of the subject matter, the study showed that the systems approach to instruction was more effective than the traditional approach to education.

Aziz (1984) in a study of Science Education in the Secondary Schools of Bangladesh, reported that the science teachers of all the schools were following almost exclusively lecture methods for teaching science in the classrooms. Demonstration and assignment methods were in occasional use, and other ways were rarely used. The use of teaching aids like models, charts, diagrams was occasional in the classroom. Mechanical teaching aids were not in use in any of the schools despite their availability in schools. The discovery and enquiry approaches of teaching science were not being followed in any of the schools under study. It was highlighted in the survey that this might be due to the inadequate knowledge and training of science teachers and the scarcity of physical resources in the schools.

Deopuria (1984) studied the comparison of the environmental and Traditional Approaches to the Teaching of Science in the Schools of Madhya Pradesh. The study showed that students of the experimental group of classes V, VIII, IX and X obtained higher achievement scores due to teaching science through the environmental approach. The ecological system showed a more significant cognitive gain in knowledge, understanding, and applying science concepts related to environmental education at primary, middle, and secondary school levels. However, it was not effective in teaching factual recall type concepts at middle and secondary school levels. The environmental attitude inventory showed significant positive gains in attitudes towards the environment for the entire experimental group of students. Further, the study revealed that the difference between teachers' attitudes towards the environmental approach followed at different grade levels is not significant.

Mohapatra (1989) undertook a study entitled "Four dimensions of the teaching-learning of Science: Characteristics and Implications." The Mohapatra focused on studying the pupils' popular preconceived concepts about scientific events related to their day-to-day live observations. The researcher also investigated the implications for organizing suitable teaching-learning strategies through the utilization of their experiences. According to the study, it is in this process that children formulate alternative concepts about things, objects and events. The study also showed that the science teacher had an essential role in helping the child to develop ethical ideas about objects and events by utilizing children's personal experiences with the rational thinking process.

Joshi (1995) compared the effectiveness of Audio- Visual stimuli in the context of science teaching. The objectives of the study were: to construct and establish the medium of audio-visual concerning achievement, to study the effect of the numeric difference in

words through audio media on students' achievement, to study the differential impact between audio, audio-visual and audio & still picture on students' achievement. Sixty students from three sections of class 8th constituted the sample for the study. After the pre-test, the experimental group was exposed to different types of audio-visual mediums. Section A was exposed to audio media, Section B to audio-visual media and Section C to audio & Still pictures. Lastly, a post-test was administered. The achievement test developed by the investigator was used as a tool. The study's findings were: Audio, Audio-Visual, Audio & Still picture as media can be created for science teaching. The findings revealed:

1. The numeric difference of words used through audio media affected the students' achievement.
2. Effective instruction about students' achievement can be equally done through audio, audio-visual and audio & still picture.
3. The comparative effect between audio, audio-visual and audio & still picture was not visible.
4. All three media differentially affected the knowledge, understanding and applicability of concepts as seen in students' achievement.
5. Students' interest increases when instructed through audio-visual media.

Mao et al. (1998) conducted a study on Inquiry Teaching and its Effects on Secondary School Students' Learning of Earth Science Concepts and compared the effects of inquiry-based teaching and traditional teaching on student learning of earth-science concepts at the Secondary-school level. The results indicated that students taught using inquiry-based instructional methods scored significantly higher on selected test items than those led by a traditional teaching approach. There was a significant improvement in achievement test performance, especially on the comprehensive and integrated test items but not factual knowledge.

Umasree (1999) conducted a study on the Science Curriculum and its Transaction in the Secondary Schools of Baroda. The objectives of the study were:

1. to study the intentions of the science curriculum at the secondary level in schools of Vadodara city,
2. to review the curriculum transaction in science in the classroom situation in schools of Vadodara city,
3. to study the teacher's opinion about the different aspects of the science curriculum through classroom observations, questionnaires and interviews,

4. to evaluate the congruency between the intended and transacted curriculum.

The data collection tools includes classroom observation, semi-structured interviews and questionnaires. The sample was 16 secondary schools in Vadodara city, covering 50 teachers and 240 classroom sessions in science for VIII, IX and X standards. Data analysis was done through frequency and percentage. The study findings reveal that 83% of teachers indicated that the objectives of teaching science were precise. During the follow-up interview on the questionnaire, the teachers (17%) believed that development of scientific temper is one of the objective for science teaching, but how it was to be created had not been stated in the textbook. The teachers suggested some science curriculum objectives, such as acquiring scientific knowledge and exposure to practical work. Findings related to the classroom observation state that lecture method was used in 70% of cases, lecture cum discussion method in 10% and lecture cum activity teaching strategy in 6% of the cases. Non-conventional approaches were observed in the remaining 14 % of the classes (read aloud, reading aloud and translating into vernacular language, reading aloud with brief explanation after that). Majority of the cases, "teachers talk" predominates a significant part of the period without students' participation. In 6 % of the cases, the teacher talk to student talk was pretty evenly distributed, and the students actively participated in the development of the lesson. Teaching aids through available were not generally utilized in the classroom. In general, the students were attentive to the proceedings in the school but remained passive listeners throughout. The teachers asked a few questions to serve the purpose of introducing or ending a lesson. None of the classes under observation used problem-solving or inquiry-based teaching strategies. The language style used by the teacher was the same in which the textbook was written. It is not simplified and conveyed to the students.

Kwatra (2000) studied the science process about middle school students' scientific creativity, intelligence, and problem-solving ability. The objectives of the study were: To construct and standardize a test of science processes for the students of eighth grade, to evaluate the influence of scientific creativity, intelligence and problem-solving ability on the understanding of science process among students of high, middle and low groups for each science process separately, to study the implications of the findings of the study for the betterment of science education. The sample comprised of 631 students selected through the stratified random sampling method. The statistical techniques used to analyze the data were mean, median, mode, SD, t-test, Pearson's Product Moment Correlation, Duncan's Test and Multiple Regression Analysis. The study's findings were: The higher

group is superior to the lower and middle groups in understanding science processes. The knowledgeable group had better performance in understanding of science process than the lower and medium groups. The middle group has average performance in the knowledge of the scientific process. The high problem-solving group has better performance in understanding science processes than the lower and intermediate groups. Boys are superior to girls for science processes except predicting revolution. In predicting function, boys and girls do not differ from each other. There was a significant correlation between the selected variables of the study on one another. There was a significant correlation between the science process and problem-solving ability. There was a significant correlation between scientific creativity and intelligence. There was a significant correlation between scientific creativity and problem-solving ability. There was a significant correlation between intelligence and problem-solving ability. Flexibility and problem-solving ability contributed significantly to the quantifying process. Intelligence, flexibility problem-solving ability contributed substantially to the measuring process. Intelligence, flexibility, problem - solving ability contributed considerably to the experimenting process. Intelligence, originality and problem-solving ability contributed substantially to the inferring process. Intelligence and scientific creativity contributed markedly to the predicting process.

Parvathy (2004) studied the effectiveness of the activity-oriented method in teaching biology in small groups and large groups of secondary school students. The study's objectives were to determine the achievement total of the pupils taught by the activity-oriented method I and the activity-oriented method II. To study the relative retention of the learnt concept on achievement scores of the pupils when conducted through the activity-oriented process I and activity-oriented method II. To compare the achievement total of the pupils taught by activity-oriented methods with that of conventional textbook approach. The sample consisted of students of VIII standard selected from two secondary schools of Trivandrum. From the complete selection, 69 students in experimental group I taught through the activity-oriented method I, 70 students in experimental group II taught through activity-oriented method II, and 68 students in the control group taught through the conventional textbook approach. The components of the activity-oriented method were small group activities, activity sheets and instruction cards. The members of the activity-oriented process II were extensive group activities and lesson transcripts. The data collected was analyzed using a t-test and analysis of covariance. The study's findings signify that the achievement of students of the experiment group taught by the

activity-oriented method I were better than the achievement of students in the control group at knowledge and understanding level. The activity-oriented way II was more effective than the conventional textbook approach in increasing the understanding level retention of students of standard VIII in biology. The findings indicate that the activity-oriented method in teaching was adequate for large groups and small groups, varying concerning the achievement of a level of instructional objectives.

Pienyu (2004) studied the status and development of science education at the high and higher secondary school level in Nagaland. The objectives of the study were: To trace the historical development of science education at the school level in Nagaland, to find the relevance of curriculum in science education at school level, to know the methodology of teaching and innovations in science education, to study the examination system and evaluation system of science teaching, to study the problems related to the promotion of science education in the State. The study was descriptive and survey type. A sample of 120 schools out of 364 schools in Nagaland and 215 science teachers constituted the samples for the analysis. The data were collected with the help of a questionnaire- cum- interview schedule and by referring office records from the governmental agencies. The study concluded the following findings: More than half the total number of the Science Teachers (57%) believed that objectives of Science Education were not clear to them and accordingly minor achievement of goals of science education. 54.5% of the science teachers were satisfied with the current science curriculum and reported that it was relevant to society. The remaining 45.5% found it bookish, theoretical and therefore felt the need to update by framing a dynamic, practical based science curriculum with the national curriculum. There was no science laboratory and infrastructure facility for science practicals available in 71% of the schools in the State. Many of the Science Teachers were found ignorant about innovations in science and lacked professional training and orientation courses meant for them.

Shukla (2005) stated that one of the reasons for the declining trend in the pursuance of science education at the higher levels is the decreasing satisfaction of students with the teaching of science in the higher classes in school. Almost two-thirds of students in classes six to eight were satisfied with the quality of science teaching, but this figure declined in the higher classes. Just 40 % of those in classes XI and XII express satisfaction with the teaching of Biology, for instance. In general, the level of satisfaction is higher in private schools, and the quantum difference is most elevated in subjects like

Computer Science. The study revealed that 58% of the students in Government schools are satisfied with the teaching of Physics compared to 62% for those in Private schools.

Cronjé & Fouche (2008), in an article entitled "Alternatives in Evaluating Multi-media in Secondary School Science Teaching' described an evaluation approach to investigate the mental models of users of the programme. The study was aimed to understand the differences in the instructional designers' mental models, the time that learners spent working through the program, and the observable changes in their mental models. The results suggested considerable differences in the mental models of learners and designers about what to expect from computer-based learning. While navigational freedom allowed fast learners to move through the work, they knew already, weaker learners tend to get lost. The sketches that learners made before and after exposure to the program provided valuable insights into their understanding of the concepts.

Wolf & Fraser (2008) undertook a study on Learning environment, attitudes and achievement among middle-school science students using Inquiry-based laboratory activities. Researchers aimed to compare the inquiry and non-inquiry laboratory teaching with respect to the following: 1. students' perceptions of the classroom learning environment, 2. attitudes toward science, and 3. achievement among middle-school physical science students. The learning environment and attitude scales were valid and related for a sample of 1,434 students in 71 classes. For a sub-sample of 165 students in 8 categories, inquiry instruction promoted more student cohesiveness than non-inquiry instruction (effect size of one-third of a standard deviation). Research findings suggest that inquiry-based laboratory activities were found to be differentially effective for males and female students.

Guzey & Roehrig (2009) examined and discussed the development of technology, pedagogy, and content knowledge (TPACK) for in-service secondary science teachers on the technology integration K-12 classroom helping with inquiry-based science teaching. For this study, two tools, Technology Enhanced Communities (TEC), were designed to support secondary science teachers integrate science as an inquiry-based teaching-learning process for skill development and CMAPS as a mind mapping tool for internet processing and science learning. A descriptive multi-case study design was adopted to record teachers" development over the year-long program. The tools developed for this study were interviews, surveys, classroom observations, teachers" technology integration plans, and action research study reports. The teachers" technology plan and action plan was conducted to record the development, and it has been found that

positive effects were seen on teachers development of TPACK. The story of a science teacher starts with using technology, proper methodology, knowledge of the content and interest in the subject to grow professionally as a good science teacher. If the teacher is interested in the topic, knows how to use and when to use technology with the appropriate pedagogical knowledge, will create a program in a better way.

Wong & Day (2009) in a comparative study of problem-based and lecture-based learning in junior Secondary school Science, compare problem-based Learning (PBL) and lecture-based Learning (LBL) in Hong Kong secondary students' science achievement. Secondary students were divided into two groups: group A (n=37) was taught two topics: ―Human Reproduction‖ and ―Density‖ through PBL; group B (n=38) was led the same issues by LBL. The results of this study suggested that Problem Based Learning (PBL) was as effective as Lecture Based Learning (LBL) in gaining the knowledge required to achieve the syllabus' learning objectives. Furthermore, the PBL group showed a significant improvement in students' comprehension and mastery application over an extended time. Seemingly, PBL was favoured for knowledge retention compared to a more conventional teaching approach by the early adolescent children in Hong Kong.

Bimbola & Daniel (2010) pointed that integrated science plays a vital role in Nigerian science education programmes. They further stated that programs initiated by Nigerian government aids students at the Junior Secondary School level to create interest and choose science subjects at the Senior Secondary level, which further strengthened the importance of science-oriented courses at the next institutions. Even though the government's efforts to encourage science teaching and create interest in science among Nigerian students from the Junior level to secondary level, the enrolment of students in core science subjects and science-oriented courses in further classes was not encouraging. Because of the research reports on the effectiveness of constructivist-based teaching strategy, this study examined the efficacy of constructivist-based teaching strategy on academic performance in integrated science by Junior Secondary School students in South-West Nigeria. It revealed that the constructivist instructed students had higher post-test and delayed post-test scores than those exposed to the conventional (lecture) teaching method. The study concluded that if integrated science teachers could incorporate constructivist-based teaching strategy into their teaching methods, there would be an improvement in the academic performance of Junior Secondary School Students in integrated science. The researchers also recommended that integrated science

teachers should incorporate constructivist-based teaching strategies in their methods of teaching.

Uddin et al. (2010) tried to find out and identify the teaching problems of Science teachers at the Secondary Level. The study revealed that a combined science lab was available in most schools, but separate labs for Physics, Chemistry and Biology were unavailable. There was a deficiency of science apparatus, and the functional device was also not workable in most schools. The study also reported the lack of science teachers in schools. Science magazines and journals were not available in the libraries of schools.

Amin (2011) conducted a study entitled developing and implementing an Activity-Based Teaching Programme for pre-service student teachers. The study's primary objectives were:

1. To develop and implement an activity-based science teaching programme on student teachers.
2. To study the effectiveness of the expanded programme in terms of differences in student teachers concerning content knowledge, experimental ability, understanding about the nature of science and learning about the science teaching.
3. To study the effectiveness of the developed programme in terms of student-teacher opinion about each of the activities.

Single group pre-test treatment post-test design was considered as research design for the present study. The sampling was purposive and comprised of 40 student teachers. The programme was implemented throughout the academic year. Achievement test, activity evaluation sheet, science scale, observation schedule, rating scale and field notes were the tools used to collect data. Different analysis techniques were employed on quantitative and qualitative data. Quantitative data were analyzed through t-test, frequency, percentage and qualitative data through content analysis. The finding reveals that the achievement of student teachers was found to be significantly different in the post-test when compared with the pre-test. There was a significant difference in the score of practical skills of the student teachers concerning the given treatment. There was a substantial difference in the science scale of the student teachers to the given treatment. In conclusion, the researcher revealed that the developed Activity Based Science teaching programme was found to be statistically significant in improving clarity in practical skills and also on overall science concepts. Further, the program enhanced the understanding of the nature of science, and refined qualities of the student teachers in general and

science teacher in particular. It was also concluded by the researcher that there was an enrichment in the comprehension of the scientific activities among the student teachers.

Ayeni & Adelabu (2011) conducted a study to examine learning Infrastructure and environment for sustainable quality Science Education in secondary schools and its effect on the teaching-learning activities. A descriptive survey design method was used to conduct the study with a multistage sampling technique. Six hundred samples were used for the analysis, including 60 principals and 540 teachers from Ondo state, southwest Nigeria. The tools used for this study were "Learning Environment Management Questionnaire (LEMQ)", "Teachers Instructional Task Performance Rating Scale (TITPRS)", and "Interview Guide for Principals (IGP)". The findings state that teachers' perception of quality of learning based on Infrastructure and environment is 41-60.5%, and 19-59% of the schools have inadequate quality. This means that the quality of the Infrastructure in secondary schools is at an average level. There is a significant relationship between Infrastructure and the academic performance of secondary schools in Nigeria.

Bryan et al. (2011) conducted a study on Motivation, Achievement, and advanced placement intent of high school students learning science. Within the framework of social cognitive theory, the researchers examined students' motivation (14-16 years old) to learn science in their introductory science courses. The study pointed out a significant relationship between the students' intrinsic motivation, self-efficacy, self-determination, and achievement. When compared, it was found that self-efficacy was the motivation factor most related to achievement. The Advanced Placement Program (AP) aspirants were higher than non-aspirants in intrinsic motivation, self-efficacy, self-determination, and achievement. Patterns in students' essays and interviews identified inspiring teachers, career interests, and collaborative-learning activities as solid motivators. The findings suggest that science teachers should use social modelling and collaborative-learning activities to foster students' motivation, Achievement, AP intent and interest in science careers.

Millar (2011) while reviewing the National Curriculum for Science, considered the extent to which the National Curriculum for science have influenced practice and learning outcomes. In this article, the author identified and discussed three central issues for the review, viz. the structure of the science curriculum, the purpose of science within the school curriculum, and how curriculum content was specified and communicated. In this paper, the author examined the role of school science in improving the 'scientific

literacy of all young people and providing a sound foundation for the more advanced study. Finally, the author argued that clear communication of intended curriculum content requires examples to show how these might be operationalized and recognize both the value and limitations of evidence and theory to underpin sequencing science curriculum content decisions.

Bathari (2012) conducted a comparative study of teaching science at standard VIII in the government schools through improvised and traditional demonstration methods. The study's objectives were to compare the mean achievement scores of Improvised Demonstration Group and Traditional Demonstration Group of students in science considering covariates: Intelligence, Scientific Attitude and Scientific tendency. To study the effect of remediation on the achievement of students in science. To check the reactions of the students' on the treatment. A post-test control group design was employed. A sample of 186 students of standard VIII was selected randomly from four schools of Khandwa city. Improvised material was developed in science on twenty-five topics of physics for class VIII. The data were analyzed through ANCOVA, ANOVA and percentage analysis. The findings of the study state that the mean achievement in science through improvised demonstration was significantly more outstanding than that through traditional demonstration when scientific attitude and intelligence was taken as a covariate. The spontaneous demonstration was found to affect higher intelligence and lower intelligence students equally. Students (85%) were found to have favourable reactions towards the Improvised Demonstration.

John (2012) in a study entitled Development of Programme Instructional Material on "Structure of Atom" in Chemistry at Secondary Level and research of its effectiveness at different levels of intelligence, found that for all levels of intelligence viz. High brightness, Average intelligence and Low intelligence, the teaching through the Programmed instructional material were more effective than the traditional teaching method. It was also observed that the average intelligent students gained better by programmed instruction than high intelligence and low brilliant students. Further education through programme instructional material is more effective for students with a low level of intelligence than students of a high level of intelligence.

Johnson & Ramaganesh (2012) studied the effectiveness of the self-regulatory strategy in science problem solving among high school students. Self-regulatory strategy was implemented among students of rural areas to develop problem solving skills in science. The success of the experiment was analysed by comparing scores of experimental and

control group. The major findings of the study revealed that male and female students do not differ in their problem-solving action. It was further stated that the self-regulatory awareness of science students in rural areas during their problem-solving activity is comparatively less.

Mohammadpour (2012) in an article entitled "A multilevel study on trends in Malaysian secondary school students' science achievement and associated school and student predictors' tried to investigate the variations in science achievement for secondary school students across the Trends in International Mathematics and Science Study (TIMSS) assessments and to examine the relations of several students- and school-level factors with achievement. The results indicated that 48.64%, 48.96%, and 60.95% of the variance in achievement scores accounted for between-school differences in the 1999, 2003, and 2007 studies. After controlling for the school-level factors, gender followed by the science self-concept in both the 1999 and 2003 studies, time spent working at home and valuing science in the 2007 study yielded the most vital link to achievement. At the same time, controlling for the student-level factors, school location, instructional limitations, and teacher emphasis on homework had the strongest association with achievement, respectively, in all three studies. It was concluded that the variation in science achievement at both student and school levels was significantly increased in TIMSS 2007 compared to the two previous studies.

Nimavathi & Gnanadevan (2012) conducted a study to develop a multimedia programme for science teaching and experiment with class IX students. The study aimed to determine the effectiveness of multimedia programs over the conventional teaching method. Students of IX standard considered as experimental group, were taught through multimedia program in science subject and students in control group were taught through usual teaching method. The results showed that the multimedia programme prepared by the researcher was more effective for the achievement in Science of ninth standard students. The students' learning through the multimedia programme were better in science concept understanding than that of the conventional teaching method.

Parekh (2012) developed and implemented a holistic science education program at the secondary school level. The study's objectives were to create a holistic science education program and study its effectiveness to certain selected variables. The sample for the analysis constituted of students of standard IX of the selected schools. The sampling technique used was cluster sampling. Tools for the study were a content test, Value Inventory, activity-based demonstration scale, environment sensitivity test, life skill

inventory and spirituality test. The techniques used for data analysis were t-test, ANCOVA and Chi-Square for quantitative data and content analysis for qualitative data. The significant finding of the study was that the adjusted mean score of the experimental group on the content test was found to be significantly greater than that of the control group. It implies that the developed program resulted in significant cognitive development.

Parveen & Batool (2012) studied the effect of cooperative learning on students' achievement in General Science at the secondary level. Through the study, the researchers tried to include cooperative learning in general science. Students of the experimental group were taught through cooperative learning method and control group through regular method. Data were collected and analysed to study the effectiveness of cooperative learning among secondary students. The result of the study showed that the collaborative learning method was superior to the traditional way in general science achievement of 9th-grade students.

Moeed (2013) in a study science investigation that best supports student learning through exploration of understanding of science teacher. The study says about the pedagogical approach to teach science through investigation and understanding of teachers" science through investigation. A case study was adopted as a technique to explore the relationship between motivation, learning and assessment of students. The sample of 165 science teachers from 11th grade was collected in the excellent Wellington region. Only 61% of the science teacher responded questionnaire. Apart from this, 10th-grade science teachers were interviewed from urban schools of middle size and coeducational—the findings of science investigation aid in learning through understanding, experiment, scientific method and proper testing. The results also reveal that curriculum understanding and assessment should be considered of prime importance for a better pedagogical approach.

Myrten (2013) conducted a study entitled "A Study of Scientific Attitude and General Intelligence about the Level of Academic Achievement in Science among Higher Secondary Students in East Khasi Hills District, Meghalaya". The study's objectives were: to compare the Academic Achievement of Higher Secondary Science Students regarding sex, community and management. As per the study, it was found that that the mean academic achievement score of male higher Secondary science students was significantly higher than that of girls. Further, higher secondary science students' mean academic achievement score from Government schools was considerably lower than the mean academic achievement score of higher secondary science students from Private

schools. Similarly, higher secondary science students' mean academic achievement scores from Government schools were significantly lower than higher secondary science students' mean academic achievement scores from Deficit Schools. No significant difference was found to exist between the mean score of academic Achievement in Science between students of Deficit and private Schools even though the mean score of academic achievement of higher secondary students from Deficit schools was slightly higher than the mean score of academic achievement of higher secondary students from Private schools.

Pillai (2013) developed and implemented an intervention programme in science and technology for physics topics for standard IX. The study's objective was: To study the effectiveness of the developed Intervention Programme in terms of students' achievement on the conceptual understanding of physics concepts, Interpretation of Physics concepts from the stories, Logical sequencing of Physics concepts from the images of events projected. The significant findings from the study were: the intervention programme helped the experimental group students to relate the concepts to the daily life events better than that of the control group students. The intervention programme resulted in significant achievement scores of the experimental group students compared to the control group. In the experimental group, students could better relate the context in the story wherein the principle/concept occurred. The study also found the students had a favourable and favourable reaction towards the implemented intervention programme.

Shamsiah (2013) studied the need for practical work in science at the lower secondary level. The researcher focuses on the current demands of practical work in the Malaysian science curriculum (Ministry of Education, 2002). The functional outcome of science was further divided into conceptual, procedural and affective domains. The study's survey was done in the southern part of Peninsular Malaysia, where six teachers (2males & 4 females) were selected as a sample for the study. The interview schedule was the tool for the study, which was an in-depth and semi-structured type. The data collected was qualitative, and the analysis was done by Baillie and Hazel" s (2003) framework. The result states that all the teachers believe in procedural knowledge and student follow the instructions with their manipulative skills. Some teachers also believed in conceptual understanding, which should be used to examine the concepts. The minimum responses came for creating interest in the student for science practical. The researcher believed that practical work could transform a teaching and learning environment that only

required the students to listen to lectures and write notes into learning experiences that allowed the students to be actively involved in the teaching and learning activity.

Shamsudin et al. (2013) conducted a study on Strategies of teaching science using Inquiry-Based Science Education (IBSE) by novice Chemistry teachers to examine how meaningful Science learning could be achieved via introducing an inquiry-based Science teaching approach. Three trainee teachers who underwent their teaching practice in the 2nd Semester 2011/2012 session participated in the study. The findings revealed that the inquiry-based teaching strategies employed could stimulate excitement among students when learning science. The ZYL teaching model was proposed at the end of the study, along with a summarization of the strategies of inquiry discovery in Science Education that can be adapted in the science teaching process.

Dey (2014) critically studied Science education in the Secondary schools of Tripura and highlighted the problems related to science education in the State of Tripura. According to the study's findings, different kinds of academic problems were identified, hindering science education development. The study revealed that in most schools, the student-teacher ratio was not maintained, and in only 30% of schools, the balance was maintained strictly. Moreover, in 21% of schools, science textbooks were not available, and in 43% of schools, there was always a scarcity of science materials. Out of the total sampled schools, 49% of schools have libraries that were not fully equipped with the required facilities, and only 14% of schools do not have any kind of library problems. Further, the study revealed that in 42% of schools, there was always a shortage of science books in a library. It was also found that only 26% of schools were a library that had separate reference sections and reading rooms. According to the study, 30 to 31% of schools have a library that contains journals, periodicals, magazines and science encyclopedias. Textbooks and reference books were available in 33% and 31% of schools, respectively. Only 25% of schools seating arrangements were available in the library. The study also showed that there were rural and urban schools which do not have any laboratories. It was only in 31% of schools that laboratory facility was available. The remaining percentage of schools does not have any facility or any provision for constructing a laboratory.

Lodh (2014) conducted a study of The Science curriculum of Secondary schools in Tripura to examine the process of curriculum development for science education of secondary level in Tripura and to study the status of the Science curriculum in secondary school Schools. According to the study's findings, a contextual gap was reported between

the framing, implementation of objectives, and process of curriculum development by the different secondary schools of this State and the preparation of the curriculum by TBSE. It was also found that some theoretical and practical implementation differences existed in the process of curriculum development between TBSE Secondary Physical Science curriculums and the CBSE curriculum. The survey also showed that 97.6% of secondary schools of Tripura state are under TBSE only 2.3% are under CBSE. Maximum students, as well as schools, are under TBSE and the State Government School Education Department. So in top secondary schools, the secondary physical science curriculum has been recognized by TBSE under the Department of School education of the state Government. According to the TBSE (Tripura Board of Secondary Education), the recommended physical science curriculum in Physical Science plays a vital role in developing well-defined abilities in cognitive, affective and psychomotor domains. It augments the spirit of enquiry, creativity, objectivity and aesthetic sensibility. Therefore, the Secondary Physical Science syllabus understudy has contained 24 subjects (items) for both IX and X standards. Out of 24 items, 11items are physics-related, 13 items are chemistry. In TBSE, secondary physical science curriculum subject matter has been chosen from both concepts of Physics and Chemistry.

Mehta & Kulshrestha (2014) through their study "Implementation of Cooperative Learning in Science: A Developmental-cum-Experimental Study", stated how to apply cooperative learning and assess collaborative skills in science classes at a secondary level of education. Jigsaw technique was used to study the collective talent of the students; for this, 40 heterogeneous groups of students were selected with the method of purposive sampling. The sample consisted of secondary students with average and high intelligence. Instructional material and the observational schedule were developed to study cooperative learning and skill, done by "one group, pre-test & post-test". This was done in three steps: planning, implementing and observing where experts plan and monitor the students' Cooperative Learning. The instructional materials were used to teach science for ten sessions, and observations were noted down at every session, assessed at the end of every session to see the impact. The findings state that collaborative skills were enhanced during the experimental period, and Mann Whitney U Test observed positive interdependence and skill development. The result showed a significant difference in every session of operative learning in the students who were developed during the whole skill development process.

Ahmad & Rai (2015) in an article entitled "supporting scientific argumentation in integrated technology classrooms', suggested that all science teachers must possess some basic skills of using hardware and software. It was further indicated that there is a dire need to overhaul the pedagogical understanding and educate teachers to use contemporary technologies in the science teaching-learning process. Educational institutions should provide the ICT infrastructure so that faculties and students can access the technology as and when they require it.

Katsampoxaki et al. (2015) studied inquiry-based science education and its relation to student and teachers' perception. The main objective of the study was to provide training to teacher education professionals for Inquiry-Based Science Education (IBSE), use of science resources for both teachers and students for modification and dispersal of inquiry-based science education, engagement for science teachers for inquiry-based science education at secondary level and connecting the gap between science teachers and science education. The data were analyzed both quantitatively and qualitatively. For quantitative analysis, questionnaires were developed, and for qualitative analysis semi, structured interviews were conducted. Concurrent-mixed methods for quantitative and qualitative analysis were used in the study. The analysis of the study states that Inquiry-Based Science Education contributes positively to the educational process. The findings state a positive correlation between Inquiry-Based Science Education and students learning science in a real-world situation. The teachers and students showed a positive correlation with the perception and the challenges faced for urban and rural schools. Through inquiry-based science education teaching, the coordination between teacher and student increased with the better perception. Science inquiry is an essential phenomenon at the secondary level for identifying problems, planning and investigation purposes, teaching resources, analyzing and interpreting data for science education. Inquiry-based science education focuses on the content and process, whereas different science pedagogies are used in the constructivist classroom approach of science teaching and learning. This increases the interest and motivation in the students for science and thus develops critical thinking and reflection.

Kurbah (2015) investigated the scientific interest in the academic achievement of secondary school students of Mairang Block, West Khasi Hills in Meghalaya. The study showed that 4.7% in the first division and none in the first division with distinction. The comparison data showed that 51.93% of male and 52.43% of female students failed in science, and 38.12% of males and 32.69% of female students were placed in the third

division. While only 5.52% males secured second division, 10.03% female secured second division. Regarding the achievement in science based on the type of schools, the study showed that 37.7%, 45.96%, 67.61% and 21.15% of students from Government, Deficit, Adhoc and Private Secondary Schools fail in the Science Subject respectively. The study further showed no significant difference in the academic Achievement in Science between boys and girls. The study also showed no significant difference in the academic Achievement in Science between Government and Deficit Secondary schools students, between students of Government and Private Secondary schools and between Students of Deficit and Private Secondary Schools. However, a significant difference in the academic Achievement in Science was seen between students of Government and Adhoc Secondary Schools, between students of Deficit and Adhoc Secondary schools, and between students of Adhoc and Private schools.

Narwadiya (2015) in an article entitled "Popularization of science education through science quiz competition with documentary film screening' concluded that the quiz competition attracted the students' attention. It was mentioned that the film screen of socho-park-Jano song and Darwin puzzle, DNA as detective and stem cell therapy for rejuvenation further stimulate the students and learning were done in an entertaining mode. Teachers as well as students provided positive feedback and appreciated the choice of questions.

Prateek & Kamath (2015) studied teaching science in selected secondary schools of Rajasthan. The study was conducted in two districts of Rajasthan, namely Churu (high performing) and Jalore (low performing), to study the pedagogy of science being used in secondary government schools. In this study, 38 science classes were observed in 14 secondary schools through observation schedule and then teachers were interviewed. The study aimed to find the way of introducing the lesson and presenting new concepts, exploring the learner "s participation in the teaching-learning process, mode of activities, its adequacy, accessibility and procedure followed for evaluation and conclusion of the lesson. The result shows that teaching was learner-centred but not activity-centred. Data also revealed that there is a need to increase the use of teaching-learning materials in classroom teaching. The laboratory facilities and their accessibility were also deficient. The evaluation was done only through oral questioning, which needs improvement. Thus, the study was concluded when there is an urgent need to improve the teaching-learning situation in schools, teachers' in-service training and resource materials in the teaching-

learning process. Hence an action plan may be worked out to improve all the aspects of a teaching-learning situation in schools.

Singh & Husain (2015) in a research paper entitled "Multimedia for Learning and teaching of science at the elementary level, studied the effectiveness of multimedia science content in enhancing the achievement level of students at the elementary level and compared the achievement level of students taught by using lecture method. It was revealed that there is a significant difference in the achievement level of the students taught through multimedia content to that of students taught by lecture method. So, it can be interpreted that multimedia content is more effective in the science teaching-learning process than the traditional lecture method. Hence, prospective teachers and in-service teachers should be oriented and encouraged to use multimedia and ICT-based science content to facilitate learning in an attractive and enjoyable environment.

Eisha & Khirwadkar (2017) observed activity-based teaching-learning effectiveness in boosting Scientific skills among secondary school students. Some different activities on science concepts were developed and implemented during the regular science classes by the researchers. The pre-post achievement test was used to collect data and test the effectiveness of implemented activities. The study's findings indicated that the students in the experimental group performed better than students in the control group, which is the point of the implemented activities.

Masoom (2017) investigated the status of ICT integrated Science teaching and learning in DIET in Delhi. The study's primary objective includes finding out the availability of ICT and analyzing the functionality of ICT in DIETs and studying the integration of ICT in teaching science by student-teachers during teaching practice. The researcher used an observation schedule, interview schedule, attitude scale and a checklist as a tool to conduct a study. All the instruments were self-constructed by the researcher. Data collected by the investigator has revealed that DIETs in Delhi were equipped with all the essential ICT resources. However, compared with the policy document (NCFTE 2009, 12th five-year teacher education plan), it was found that DIETs of Delhi do not possess the ICT resources as per the prescription of these policy documents. For instance, it was found that hardware such as a laptop, a computer system which includes CPU, Monitor, keyboard and mouse are available in all the DIETs. However, these kinds of hardware resources are not available in prescribed numbers which should be available in the ratio of 1:1. Software resources such as multimedia, publication tool, web resource, internet resources, power backup and storage devices are miserable. It was also found that most

of the student teachers did not utilize ICT resources during the school experience component known as teaching practice.

Karim (2018) studied the implementations of recommendations given by the National Knowledge Commission for Science Education in secondary schools of Delhi. The researcher considered school infrastructure, science pedagogy and scientific aptitude and studied their effect on science education considering various variables recommended by NKC and the blueprint for growth, innovation and inclusiveness- knowledge initiatives of the Delhi government at a secondary level of Delhi. The checklist consists of 17 items for assessing quality education which describes the school building, classroom features, safety features, science laboratory condition, library status, computer room, principal room, playground and scientific aptitude test battery (SATB) by K.K Agarwal for assessing scientific aptitude, where the tools for the study. The findings revealed by the survey were: most of the private schools have better school infrastructure than the government and government-aided schools of Delhi, private schools have working laboratories, libraries and other facilities as compared to government and government-aided schools of Delhi, In all types of schools continuous evaluation takes place, It was also found that qualification and content knowledge of the teachers are good in all kinds of schools, but private school teachers deliver it in a more appropriate and by creating interest in the science classroom.

Tron (2018) studied the status of science education in the secondary schools of Meghalaya and intended to find the infrastructure facilities like laboratories, teaching aids, equipment, and even literature to teach science. The study also tried to highlight the status of science teachers and teaching strategies employed by them during the class. As reported by the researcher, the findings reveal no major problem about Infrastructure for science teaching. Still, it highlighted the absence of a proper and appropriate library with good books and reference books. The study also revealed that science teachers did not use diverse methods and strategies of science teaching. Adopting the problem-solving process and the project method in the wrong sense indicated a significant problem in science teaching-learning.

Eisha (2020) in an article entitled, "Teaching-Learning of science through local culture: Ethnoscience", emphasized the implications of the teaching-learning process in science through local culture. With the support of many studies, the author tried to call attention towards the new and emerging concept, i.e. ethnoscience. Ethnoscience based teaching-learning involves learning of science linked with students' daily life, culture and

traditions. The author also proposed some suggestions in the form of critical points in the article to introduce ethnicity or local culture in science teaching.

2.6.2 Summary

This part of reviewed literature deals with studies focusing on teaching-learning of science and technology subjects either as a single subject or in different components (physics, chemistry, biology) at all the stages of education. For this section, the researcher reviewed almost 59 studies, out of which she reported 45 here, in this chapter.

The studies carried out by Vardhini (1983); Anjaria (1984); Deopuria (1984); Mohapatra (1989); Joshi (1995); Mao et al. (1998); Wolf & Fraser (2008); Kwatra (2000); Amin (2011); Bryan et al. (2011); Nimavathi & Gnanadevan (2012); Mohammadpour (2012); Parekh (2012); Myrten (2013); Eisha & Khirwadkar (2017) applied different approaches for the teaching of science at the secondary level to develop scientific attitude and scientific skills. Vardhini in 1983; Cronjé & Fouche in 2008; Singh & Husain in 2015 prepared a Multimedia Instructional Strategy for the teaching of science focusing on two components, i.e. Physics and Chemistry. The strategy was found to be very effective for students and feasible for teachers. Whereas, Anjaria (1984) and Bimbola & Daniel (2010) explored the Systems Approach and integrated approach for science teaching learning among students of X class. The studies claimed that both the methods were more effective than the traditional approach; even in the case of subject matter retention, the process was proved to be more effective. In 1995, Joshi's study revealed that Audio, Audio-Visual, Audio & Still picture as media used for the teaching of science differentially affected the knowledge, understanding and applicability of concepts that could be seen in the achievement of students. Parekh (2012) developed a holistic science education program for secondary students. The study implied that the developed program resulted in significant cognitive development.

Studies conducted by Shamsudin et al. (2013); Pillai (2013); Mehta & Kulshrestha (2014); Ahmad & Rai (2015); Katsampoxaki & Fouskaki et al. (2015); Kurbah (2015); Eisha (2020) focused on different strategies for teaching science. Parvathy (2004) and Pillai (2013) developed an activity-based intervention program, and Shamsudin et al. (2013) and Katsampoxaki & Fouskaki et al. (2015) implemented Inquiry-Based Science Education for meaningful learning. In contrast, Mehta & Kulshrestha (2014) exercised cooperative learning to assess collaborative skills in science class. Going forward, Ahmad & Rai (2015) supported integrated technology classrooms for developing scientific skills. In an article, Narwadiya (2015) detailed the importance of quiz

competition with a documentary film screening to attract students towards science subjects. Wong & Day (2009) highlighted the effectiveness of problem-based Learning (PBL) over lecture-based Learning (LBL) in the science teaching and learning process.

The research also reviewed focused survey studies to observe the teaching-learning process in secondary schools and to know the status of science teaching for decades. Aziz (1984) surveyed the quality of science education in the secondary schools of Bangladesh. He reported that science teachers of all the schools followed almost exclusively lecture methods for teaching science in the classrooms. In a study, Umasree (1999) studied the Science Curriculum and its Transaction in the Secondary Schools of Baroda and concluded that most science teachers indicated that the objectives of teaching science were precise and mostly lecture method was the only tool for the teachers to teach science. An investigation by Pienyu (2004) & Tron (2018) to know the status and development of science education at the high and higher secondary school level. The analysis of the survey found some negative results. Uddin et al. (2010) studied the teaching problems of science teachers. According to Shukla (2005), there were many reasons behind the declining science education. The foremost reasons suggested by Shukla include decreasing satisfaction of students with the teaching of science in the higher classes in school, and most of the science teachers were found ignorant about innovations in science and lack in professional training and orientation courses meant for them. In another work by Masoom in 2017, it was found that most of the student teachers did not utilize ICT resources during the school experience component that is also known as teaching practice. The researcher tried to review the status of ICT integrated Science teaching and learning in DIET in Delhi.

In a similar line, Dey (2014), Lodh (2014), Karim A (2018) looked over the status and challenges of the science curriculum. The science classes were closely observed by the researchers to understand the pedagogy of the science teacher and reported a need for better science pedagogy and a student-centred curriculum. More in 2013, Prateek & Kamath (2015) considered the pedagogical approach the centre of their research and revealed that curriculum understanding and assessment should be a better pedagogical approach to be regarded as prime necessary. Shamsiah (2013) studied the need for practical work in science at the lower secondary level and found that most teachers believe in procedural knowledge, and minimum responses came for creating interest in the student for science practical. To know the status of implementations of recommendations given by the National Knowledge Commission for science education,

Karim (2018) carried out a study. The findings highlight the worst condition of science education in government schools of Delhi when compared with private schools. Ayeni & Adelabu (2011) surveyed for quality and sustainable Science Education through infrastructure and environment management questionnaire. The findings state that teachers' perception of quality of learning based on Infrastructure and environment is 41-60.5%, and 19-59% of the schools have inadequate quality.

Most of the reviewed research was experimental with few exceptions (survey).

2.7 Observations

Research is a never-ending process as it keeps on moving with the addition of more advanced knowledge. Even in education, with each passing Day, education research is becoming more advanced and already experimented fields form a solid literary base for new research. A review of related studies establishes a robust supporting pillar and nourishes the researcher with a complete understanding of the problem.

In this chapter (review of related literature), the researcher reviewed almost 177 studies. The studies were primarily experimental, carried out generally with pre-post design, including few exceptions (survey, case study, theoretical or conceptual). Most of the studies reviewed under different sections were related to developing behavioural and social problems in adolescents. For decades educational studies were conducted by many researchers (Magee, 1999; Weitlauf, Smith & Cervon, 2000; Nair, 2005; Menarth et al.,2012; Botvin & Griffin, 2012; Puspakumara, 2013; Hita & Kumar, 2017;) to understand the fundamental issues and concerns behind academic and social distress in adolescents and practical life skill training to be an effective solution for this distress and educational stability. Some researchers, i.e. Slicker, et al. in 2005 and Malhotra in 2006, also proved that parents could quickly develop life skills at home with high rearing styles and responsive parenting. The number of studies such as Reed (1994); Waltemire (1999); Thurston (2002); Shangold (2004); Lynch (2007); Kenneth (2008); Scott & Jenifer (2009); Nejad (2010); Richard & Kumaravel (2014); Sardesai et al. (2014); Gamble (2006); Junge et al. (2006); Sterling (2006); Madhu (2008); Bharath & Kumar (2010); Garg (2011); Ozaeta (2011); Gomes & Marrques (2013); Kumar & Chhabra (2014) reported in the chapter, spotlighted in their findings that Life skill education proved to be beneficial in dealing most of the adolescents' issues in formal (school) as well as informal educational settings.

Almost all the studies reviewed above supported using a practical approach in the teaching-learning process in science & technology subjects, and integrated education yields even better results. This experimental approach may include any method of teaching-learning; it may be cooperative learning, activity-oriented, self-analysis, project-based, multimedia-based and so on. The studies carried out by Vardhini (1983); Anjaria (1984); Deopuria (1984); Mohapatra (1989); Joshi (1995); Mao et al. (1998); Wolf & Fraser (2008); Kwatra (2000); Wong & Day (2009); Bimbola & Daniel (2010); Amin (2011); Bryan et al. (2011); Nimavathi & Gnanadevan (2012); Parekh (2012); Mohammadpour (2012); Parekh (2012); Myrten (2013); Singh, & Husain in 2015; Eisha & Khirwadkar (2017) applied different approaches for the teaching of science at the secondary level to develop scientific attitude and scientific skills in students as well as encourage better science teaching-learning.

The researcher tried to get to the bottom of the number of studies related to life skill education and disseminated essential highlights. The observation revealed from in-depth analysis of the reported studies were presented below:

1. Life skill training is practical while answering highly concerned questions of adolescents age, such as substance abuse, aggression, tobacco, drugs, reproductive health, gender issues.
2. Life skill education help teachers in dealing with delinquent behavior, conflict management, and social adjustment related matters of students while understanding their perspectives.
3. It boosts self-esteem, self-concept, assertiveness, self-confidence, communication skills, interpersonal relationships in all age groups.
4. Life skill education could also empower parents while tackling all parenting issues.
5. It was observed in most of the studies that most of the teachers were not well informed with life skill education due to lack of proper training in the concerned field.
6. Almost all the research work which discussed the significance of life skill education in teachers' training suggested a priority recommendation for integrating life skill education in teachers' training.
7. Most of the research focused on during-school and after-school life skill programmes for children of all age groups to deal with real-life situations and perform functions of age, gender and ethnicity in a much better way.

8. Subjects like music and sports could help brush up hidden skills in particular children.
9. Life skill education integrated with specific subjects could yield even better results.
10. Results from various surveys regarding the status of science and technology subjects in different states of India and some countries show some downhearted results.
11. Overall implications drawn from the above-reviewed literature was highlighted subsequently.

2.8 Implications of the Review of Related Literature

The Life Skills programme promoted positive social adjustment at elementary schools, improved academic performance (Elias et al., 1991), and prevented tobacco and alcohol use (Botvin, Griffin, Paul & Macaulay, 2003). For adolescents, Life Skills-based intervention improved impulsive control (Caplan et al., 1992), developed self-management skills (Anderson and Moore, 2009), prevented peer rejection, reduced bullying (Mize & Ladd, 1990), improved teacher-student relationships (Thurston, 2002), reduction in drug use (Botvin & Griffin, 2012), increased self-esteem and decreased depression (Buhs, 2000). In addition, these approaches improved AIDS-related knowledge topics and positive perception of condom use and had more realistic perceptions regarding susceptibility and seriousness about HIV / AIDS (Meyer and Steyn, 1992).

Life Skills training enhanced students' mental health, self-esteem, and assertiveness (Nejad, 2010). Influence of Life Skills modelling through literary connections on student academic success in English class was studied, and a deep critical link was apparent (Laleman, 2010). Problem-solving Life Skill was relevant to science and technology for secondary school students (Vashista & Bhardwaj, 2006). Learning mathematics was noted to develop Life Skills like problem-solving among middle-class students. Further, it was remarked that for the development of Life Skills, different strategies like an after-school programme that utilized experiential and cooperative learning activities (Junge et al., 2006) and classroom-based social decision-making intervention (Elias & Kress, 2005) were required.

Sports and Life Skills intervention increased coping skills, athletic perceived performance, and general self-worth (Moffett, 2005). Motor coordination problems were

reported to be reduced with the practice of Life Skills among schoolgirls with autism spectrum disorder and developmental coordination disorder (Kopp & Gillberg, 2010). Further, students with dyslexia reported favorable views of their Life Skills development self-efficacy in academic, personal, social, career, and talent development domains (Shea, 2011). Instructors of rural high school students with mental retardation reported the effectiveness of the personal-social skills curriculum for an extended period and with continuous reinforcement (Quigley, 2007).

Employee productivity was reported to be enhanced by Life Skills training that facilitated psychosocial skills (Maree & Ebersohn, 2000) and increased efficiency and quality of work (Lobner, 1997) and reduced problems at the workplace (Hartley, 2007). Life Skills training programme was related to higher self-efficacy (Shechtman, Levy & Leichtentritt, 2002)

The activity-oriented instruction was effective in Life Skills education than the conventional lecture method for secondary school students (Pereira & Krishnan, 2011). The use of music in teaching Life Skills to students with emotional disabilities was recommended (Emeka, 2009). Online teacher monitored instructions for Life Skills were suggested to enhance students' performance at the secondary level (Grover, 2006), systematic and formal teaching of Life Skills to the middle. Junior high school students were recommended for interpersonal relations and survival, and success (Hamburg, 1990). Jones, Brian, Airedale & Norma, 2006 suggested an enterprise mode of learning for the flexible market economy and provision of resources for teaching Life Skills and sexual and reproductive health was promoted by Kalanda, 2010.

Open and distance learning mode was suggested to deliver a program on Life Skills to adolescents (Lineo & Kolosoa, 2009). A quality instruction model with home-based remediation was reported to enhance students' performance on Life Skills (Malhotra, 2006). Barnlund transactional model of communication was found to be effective in improving the Life Skills of students like critical thinking, decision making and communication skills (Meena, 2006); making Familiar Strange approach of Synectic model of teaching was reported to enhance the creative thinking ability of learners (Pany, 2008), child play-based programme was developed to nurture children's creative expression (Rowland, 2002), project-based learning was reported as successful to teach critical Life Skills to help students succeed in college and life in general (Scott & Jenifer, 2009; Zimmer, 2008) and films on the content of critical thinking skills were reported to improve knowledge of the content area (Weerts & Sally, 2005).

Life Skills training was indicated to decrease the onset of smoking behavior among students of the eighth, ninth and tenth grades due to increased ability to cope with direct pressure to smoke, anxiety, and decreased susceptibility to indirect pro-smoking social influences (Botvin & William, 1980). Reduced drug and alcohol use among ninth-grade students (Carmack, 2005) and student of the programme indicated an intention to stay smoke-free (Zollinger, Commings & Caine, 2003). Life Skills-based education was stated to have a reduced probability of young individuals engaging in interpersonal violence (Guera, 1994). Life Skills-based structured learning therapy reduced depression among students (Reed, 1994) and reduced peer-directed aggression among boys (Hudley & Graham, 1993), positively impacting decision making, problem-solving and conflict management (Magee, 1999).

Life Skills training programmes for college students improved self-concept and reduced depression and anxiety (Davis, 2004). Few studies suggested that Life Skills developed coping skills for anxiety and depression, interpersonal and cooperative skills (Shangold, 2004), and contextual variability in the transfer of problem-solving skills to increase the likelihood of accurately solving transfer problems and recognizing principles in novel problems (West, 2003). The study of Life Skills on teacher education programmes was suggested to facilitate learning, manage class, generate a resource, and assess (Louis, 2008). Parental responsiveness was indicated to predict Life Skills development in older adolescents (Slicker et al., 2007).

Social skills training programme was found to be effective on a child's behaviour problems (Misner, 1995) to develop interpersonal behaviors and skills for adolescents (Chaudhari, Vaidya and Mahapatra, 2007). The awareness training model of life science was adequate to create creativity and academic Achievement (Christane, 2008). Study skills training for standard eight students was found to positively impact their achievement in biology (Gafoor and Shemi, 2007). Guidelines to develop skills for adolescents to encourage positive choices was designed by Halter and Lang (1994)

There are many studies related to life skill education. These studies implied that a well-developed strategy could encourage students in their social, physical and emotional issues. Many studies emphasized the introduction of life skill education in schools. In the workshop organized by UNESCO on life skill education in 1998, it was discussed that life skills should not be taught in isolation but should be mingled with schooling. The objective of the workshop organized by the Department of Adult and Continuing

Education at the University of Madras in 2006 is to integrate life skill education into the curriculum at the college level.

There were many studies such as Kwatra (2000); Amin (2011); Bryan et al. (2011); Nimavathi & Gnanadevan (2012); Mohammadpour (2012); Parekh (2012); Myrten (2013); Shamsudin et al. (2013); Pillai (2013); Mehta & Kulshrestha, (2014); Ahmad & Rai (2015); Katsampoxaki, & Fouskaki, et al. (2015); Kurbah (2015), which proved that integration of different teaching-learning approaches with science and technology subject results in better understanding of the subject. It was reviewed in some studies (Kwatra, 2000; Eisha & Khirwadkar, 2017). Different life skills such as creativity, problem-solving skills could be enhanced through selected topics of science subjects. Nevertheless, the researcher could not find any study that tried to develop all ten (specified by the CBSE life skill manual) life skills through science and technology subjects.

From the review of related studies, it was found that previously in life skill education, more focus was given on the health of adolescents. Still, in recent years, the need to introduce life skill education in the school curriculum was felt, and more studies were carried out at the school level to present it in the curriculum. However, there is a strong need to integrate life skill education with a subject for effective delivery of content and understanding of content in students' Day to day life situations. All the above studies show that life skill education played a significant role in enhancing students' and teachers' behavior, which improves the overall development of students, which is the goal of education. Nevertheless, the investigator did not come across any study related to the integration of life skill education and science subject not even in any other issue in India or Abroad.

As for as the present study is concerned, the investigator from experiences and the light of discussions with learned people was convinced that enhancing practical Life Skill Education is needed to be studied.

2.9 Conclusion

All the related literature studied for this research is presented in this chapter. Reviewed work was divided into different sections, and a summary for all the teams was presented underneath the same area. Research methodology related to the present work is detailed in the upcoming chapter.