LIFE SKILLS EDUCATION: THEORETICAL AND PEDAGOGICAL PERSPECTIVES

This chapter explains the historical perspectives of life skills education, concept of life skills, its integration in school curriculum, and environmental education in higher secondary stage, national and international initiatives, various environmental education programmes in Kerala and the pedagogic strategies from a theoretical perspective.

2.1 Section 1: Life Skills Education: Theoretical perspective

Life skills comprise a wide range of generic skills that help an individual to cope with various facets of life. It facilitates in strengthening the survival capacities of the individual by providing him an orientation to basic education. Life skills can enhance the abilities of the individual with the changing environment and empower them to make informed and rational choices about their future and life. Life skills are not a substitute but a complementary to formal education. These skills can be incorporated among students at any stage or level of education and through different fields of study.

Gilbert J. Botvin highlighted the importance of the life skills and initiated training programme based on life skills. He initiated a highly effective life skills training programme for youth from seventh to ninth grades to improve assertiveness, decision making and critical thinking skills. In 1991, UNESCO suggested to implement these life skills techniques for teaching in school based programme. This prevention approach has produced significant positive changes in knowledge and attitude among students. The assertiveness and ability in decision making have also changed due to their participation in the programme.

The importance of life skills in various facets of life are emphasized by researchers from different fields. Life skills are problem-solving behaviours used in the management of personal affairs (Curtiss and Waren, 1973). The development of life skills is an important part of personality development,
which can be beneficial for all young adults (Rao, 2003). Life skills constitute a continuum of knowledge and aptitudes that are necessary for a person to function independently and to avoid interruptions of the employment experience (Brolin, 1989).

2.1.1 Life skills: Concepts and Components

Life skills are abilities for adaptive and positive behaviour that enables individuals to deal effectively with the demands and challenges of every day life. It is a group of psychosocial competencies and interpersonal skills that help people to make informed decision, solve problems, think critically, creatively, communicate effectively, build healthy relationship, empathize with others and cope with and manage their lives in a healthy and productive manner. According to UNESCO (2001) Life skills are person’s ability to maintain a state of mental well being and to demonstrate the same in adaptive and positive behavior while interacting with others and with environment.

The components of life skills selected for study are explained below.

- **Self awareness** - The ability for recognition of our character, strengths and weaknesses, desires and dislikes

- **Empathy** - Empathy is an ability to imagine what life is like for another person even in a situation that we may not be familiar with. It is characterized by high motivation to help others.

- **Critical thinking skill** - The ability to make objective judgments based on reasons and empirical evidences.

- **Creative thinking skill** - It is the ability to make things in a new or unique manner.

- **Problem solving skill** - The ability to deal constructively with problems in our day to day life

- **Decision making skill** - It is the ability to make appropriate decisions at appropriate time.
Interpersonal relationship - It is a skill that helps us to understand, maintain a cordial relationship with others and also end relationships constructively.

Communication skill - It is an ability to express both verbally and nonverbally in an appropriate manner

Stress management – It is ability for recognizing and responding to emotions appropriately and managing stress effectively.

All the components of life skills are interdependent and none of them stand alone. According to UNICEF (2008) communication skills need self-awareness and empathy and even needs to think creatively and critically. When you make a decision, you need to communicate with the people concerned with that decision and try to persuade them to accept it. These skills are inter-related and reinforce each other. Together, they are responsible for our psychosocial competence, building our self-esteem and self-efficacy, and nurture holistic self-development. Self-awareness is the ability to understand our strengths, weaknesses, values, outlook, character, our needs, desires and aspirations. To know ourselves is perhaps the most difficult thing to do. It takes courage to face the truth about ourselves, our appearance, shortcomings, about things that we are good at and those we cannot accomplish. Self-awareness is the foundation for all the other life-skills we need to develop and essential to managing stress and emotions. To cope with emotional changes, we need to be aware of our emotional reactions and how they affect our behaviour. Awareness provides us with choices on how to react, rather than allowing them to govern our behaviour, which may lead to unpleasant consequences. The stress can affect our lives one has to know what sort of harmful effects the stress can have on our mental and physical health. The sources of stress has to be identified in order to take action to mitigate its impact on us. The life skills and components are presented in figure 2.1.
2.1.2 Life Skills in School Curriculum

According to WHO (1994) a well designed, tested and delivered life
skills programmes can achieve much in helping children and adolescents to
become more responsible, healthy and resilient adult. In India, the Central
Board of Secondary Education (CBSE) has introduced life skills education as
an integral part of the curriculum of class VI in 2003-04 and in class VII in
2004-05 and subsequently in classes IX and X. The schools are advised to
adopt an inter-disciplinary approach for transacting the curriculum of life skills
education. The student is evaluated through letter grading and is incorporated
in the continuous and comprehensive evaluation certificate being provided to
students by the schools. The objectives of introducing the life skills education
in schools is to empower the affective domain of the learners so that they are
able to develop a sense of self confidence, eco sensitivity and right approaches
to life. Development of basic life skills is central to the transaction of this
curriculum so that the learners become competent and responsible citizens of
the country. For the effective implementation of the Life skills curriculum, the
schools should endeavor to provide an appropriate climate for life skills
education as it is a strong and positive input to the holistic development of the
learner and development of emotional intelligence.
Central Board of Secondary Education (2005) suggested that Life skills could be taught as an independent discipline in the content areas identified by the Board. Students could be assigned simple studies and projects based on life skills, special lectures could be organized to sensitize the students on life skills and cooperation and participation of parents could be sought in developing right attitudes to life. The evaluation of life skills should be a part of the continuous and comprehensive evaluation, Students should be graded based on their skills and attitudes.

Life skills are critical to young people’s ability to positively adapt to and deal with the demands and challenges of life. A review by UNICEF (2000) found that approaches relying on life skills have been effective in educating youth about health related issues such as alcohol, tobacco and other drug use. Life skills education programmes can also be effective in preventing school drop out and violence among young people.

In the Jomatiens world conference on Education for All (1990) it was emphasized that goal of universal access and completion of primary education by all the children will be achieved by the year 2000 and 164 nations committed to “Education for All” which included life skills as a basic learning need for all young people.

The report of international commission on education for 21st century, 1996, Learning the Treasure Within, suggested the four pillars of education, which are directly leads to life skills education. The Dakar (2000) commitments advocated renewed actions to ensure education for all by the year 2015, with greater emphasis on life skills.

NACO (2008) approved that life skills are generally applied in the context of health and social events. They can be utilized in many areas including: relationship management, interpersonal communications, consumer education, environmental education, and livelihood and income generation.
2.2 Environmental Education in Higher Secondary Stage

Investigator prepared the LSEM on environmental education considering its potential for developing life skills. Environmental education means awareness about the environment as well as its implications on other living beings and non-living objects that are essential to maintain balance in Nature. The main objective of environmental education should be to develop a world population that is not only aware of the environment and its problems but also conscious of its duties and responsibilities towards it. Its aim should be to develop knowledge, skills, attitude, motivations, commitment to work individually and collectively towards solution of current environmental problems and prevention of new ones.

The implementation of Environmental Education in schools has undertaken in a mission mode to prepare young minds to appreciate the importance of environment in a holistic manner, not only for human survival but for all life forms on Earth, to inculcate a positive attitude towards environment, and to encourage pro-active action for a sustainable future. Environmental Education, therefore, aims at cognitive, affective and conative behaviour modification. This is an action-oriented, project-centered and participatory process leading to development of self-confidence, positive attitudes and personal commitment to environmental protection and its improvement. Furthermore, the process needs to be implemented through an interdisciplinary approach. The spectrum of environmental education falls in four major but integrating components: Awareness, Real-life situations, Conservation and Sustainable development. This has to be watched with the needs of the primary, lower secondary, higher secondary and tertiary or the adult education.

The goal of environmental education is to develop world population that is aware of and concerned about the environment and its associated problems and which has the knowledge, skills, attitudes, motivation and commitment to work individually and collectively towards solution of current problems and
prevention of new ones. Environmental education is indeed very important to child and adult for self-fulfilment and social development. It helps in the maintenance of life and health, in self preservation and in the preservation of human race (Rao & Reddy, 1997).

Environmental Education is a process of recognising values and clarifying concepts in order to develop skills and added tools necessary to understand and appreciate the inter-relationship among man, his culture and his bio-physical surrounding. It creates an overall perspective, which acknowledges the fact that natural environment and man-made environment are interdependent. It should consider the environment in its totality and should be a continuous lifelong process beginning at the pre-school level and continuing through all stages. It should be inter-disciplinary and examine major environmental issues from local, national and international points of view. It should utilise various educational approaches to teach and learn about and from the environment with stress on practical activities and first-hand experience. It is through this process of education that people can be sensitized about the environmental issues.

2.2.1 Initiatives in Environmental Education

2.2.1.1 International Initiatives

The two `Earth Summits' the first one held in Stockholm, Sweden in June 1972 and the second one held in Rio de Janeiro, Brazil in 1992 discussed manmade global warning and the depletion of bio-diversity. Declarations of far reaching consequences were made at these Summits. In the international context, the Report of the Club of Rome in early seventies of the last century strongly advocated the environment factor. But the remedy prescribed, i.e., 'No-Growth' was a bitter pill. It was followed by the Report of the Independent Commission on International Development issues under the chairmanship of Willy Brandt, `North-South: A Programme for Survival' (1980). The Brundtland Commission Report (1987) really looked closely and critically at the environmental issues. This Report also provided an explanatory link
between Third World poverty and global environmental deterioration. It also generated intellectual awareness of a new type of growth, i.e., `Sustainable Development'. The World Summit on Sustainable Development (WSSD) held in Johannesburg in 2002 had the same.

2.2.1.2 World Environment Day 5-6-2013

World environment day is a means to increase awareness about the environment and ensuring political action for it worldwide. World environment day calls for a collective decision by people to take action from their homes. The theme of the world environment day 2013 is – *Think. Eat. Save*. Globally the food wastage is as high as 50%. Mainly the wastage occurs in developing countries as post harvest losses, primarily due to lack of technologies and inadequate infrastructure, but in high income countries a greater degree of responsibility lies with the food services industry and the consumer.

Ironically, while so much of food is wasted, the incidence of malnutrition is as high as 30% among the world population. Lack of proper nutrition is profoundly damages to both physical and mental development and results in stunting. In 2010, over 170 million children under the age of age of five -20% of all the world’s children suffered from stunting.

2.2.1.3 Indian Scenario

In India too, environmental issues attracted popular attention and it was felt that education had to respond appropriately to this crying need of the time. The National Policy on Education (1986) (renewed in 1992) stated: "There is a paramount need to create a consciousness of the environment. It must permeate all ages and all sections of society, beginning with the child. Environmental consciousness should inform teaching in schools and colleges. This aspect will be integrated in the entire educational process." Accordingly, the National Curriculum for Elementary and Secondary Education: A Framework (1988) presented the NCERT's view: "The school curriculum should highlight the measures for protection and care of the environment, prevention of pollution and conservation of energy." In consonance with these documents, environmental
studies was made an independent subject at the primary level and topics related to environment were suitably infused with different science and social science subjects at all school stages. Books under a ‘Reading to Learn’ series were brought out to highlight a number of environment related subjects and concerns. Emphasis was also laid on teacher orientation-cum-training in the subject and a number of training modules were developed by the NCERT.

The importance of sensitizing students on the environmental issues has lead Honouroble Supreme court of India to deliver a judgment on 18th December 2003 and direct NCERT to prepare a model syllabus for environmental education in different classes which has been prepared under the title – “Environmental education in schools”. In June 2004 - 05, Environmental education has been introduced at all levels in the school curriculum.

The National Curriculum Framework for School Education (2000) also highlighted the need for including environmental concerns at all the levels of schooling. It asserts the Fundamental Duties (Article 51 A of part IV A of the Indian Constitution): "...protect and improve the national environment including forests, lakes, rivers, wildlife and to have compassion for the living creatures… “(Common Core Components, p.36). As one of the General Objectives of Education, it mentions "understanding of the environment in its totality, both natural and social, and their interactive processes, the environmental problems and the ways and means to preserve the environment.” (p.40) Following these recommendations, a subject, the Art of Healthy and Productive Living, along with language and mathematics, has been introduced at the level of Classes I and II. All the three Subjects are to be woven around the immediate environment of the learners and integrate environmental concerns as well. In Classes III-IV, Environmental Studies becomes a separate subject. In Classes VI-X, Environmental Education has been integrated suitably in social sciences, languages and science and technology. At the higher secondary level, besides integrating topics related to environment in various subjects appropriately, conservation education and disaster management
education have been included as potential subject choices along with the traditional subjects. In the Vocational Education stream, Environmental education and rural development have been suggested as a part of the General Foundation Course at this stage.

### 2.2.1.4 Gandhian Perspectives on Environment

Mahatma Gandhi was a great environmentalist and realized the importance of environment and its interrelationship with man. The concept of sustainable development was put forward by him and gave a good example of how to lead a life in an environmentally friendly way. He was a person of great foresight and always ahead of his time. Gandhiji had foreseen the situation of environmental degradation and depletion of natural resources at a faster rate. He pronounced that the earth has enough resources to meet the needs of people but will never have enough to serve their greed. He worked vigorously for a lifestyle that was predominantly based on total harmony with nature in all its forms. His approach was preventive and not curative. The way of life he developed in his Ashrams was fully conducive to nature in all its forms. His ashrams are effective models of life conducive to clean and creative environment. His programmes of community cleanliness, tree worship, cow breeding, promotion of cow milk, vegetarianism, conservation of water, open-air prayers, natural farming with use of cow dung and human excreta as fertiliser, avoidance of wastage of food etc are all devoted to conservation of environment that is conducive to higher quality of life. His struggle for ahimsa was not only towards inanimate objects but also towards preservation of trees as the source of conservation of environment. Gandhiji’s self reliant villages are good example for living in full harmony with nature.

### 2.2.1.5 Environmental Education Programmes in Kerala

#### 2.2.1.5.1 My Tree Programme (Ente Maram Scheme)

My Tree or ‘Ente Maram’ scheme is a jointly organized afforestation programme by the Department of Education and Department of Forest and Wildlife, aimed at increasing the bio-diversity wealth of the Kerala State as
well as creating awareness about the environment among school children. The programme was launched on the World Environment Day, June 5, 2007 where school students across the State of Kerala participated. Nearly 25 lakh trees were planted in one year by the students in their school compounds, vacant public places and the backyard of their homes. The schools that performed well in the campaign were also honoured with awards by the State Government. These attempts surely enhance the environmental consciousness of students and also contribute for conservation of natural resources by giving a greenish cover to earth. The success of this scheme was recognized by Government of India which awarded it the “Indira Priyadarshini Vriksha Mitra Award 2007”.

2.2.1.5.2 Our Tree Programme (Nammude Maram Scheme):

Our Tree Programme was launched on 10 June 2008, where the seedlings are supplied by the Kerala Forest Department and planted by students and teachers in College/Higher Secondary School campuses who take full care of the trees. The programme attracted more than 2,000 participating institutions across the State and nearly 10.57 lakhs of trees planted successfully. Spurred by the success of ‘My Tree’ campaign, the ‘Nammude Maram’ or ‘Our Tree’ project was jointly implemented by the Departments of Education and Forest. The Kerala Government launched an ‘Our Tree’ campaign on the World Environment Day on June 5, 2008 with the objective of spreading greenery in the State to ward off the effects of global warming. The campaign featured higher secondary level and college students planting at least 10.57 lakh rain tree saplings in College/Higher Secondary School campuses who take full care of the trees. Report shows that at least 80 per cent of the saplings planted during ‘My Tree’ campaign had survived and the students were still tending them.

2.2.1.5.3 Greening the Coast Scheme (Haritha Theeram Scheme):

The scheme aims to protect the State’s coastline from natural calamities such as tsunamis, sea erosion and cyclonic winds by establishing a bio-shield
of sand binding trees like Casuarinas along the coast. Improving tree cover in the coastal households to meet demands for fuel, fodder and small timber is also envisaged. Its implementation is through a people’s committee - Coastal Protection and Afforestation Society - locally known as Theera Samrashkana Vanavalkarana Samithy (TSVS). The society is formed by involving all the local residents of a coastal ward. At least one adult member from every family in that coastal ward is enrolled as member of the TSVS.

During 2007 to 2009, 132 committees were formed, and 163.4 ha of casuarinas and 14.65 ha of mangrove plantations raised. In addition, approximately 22.52 lakhs of popularly demanded species were distributed to the public along the coastal belt. The coastal plantation scheme has provided employment opportunity to the coastal women-folk. This highly successful programme has also been nominated for the national “Indira Priyadarshini Vriksha Mitra Award 2010”.

2.2.1.5.4 Road-side planting of shade trees (Vazhiyora Thanal Scheme);

This scheme envisages planting of shade trees on road sides in Kerala. It was initiated with the active participation of head load workers from various Trade Unions in the State and later on managed departmentally by the Kerala Forest Department; saw the planting of 1.22 lakhs seedlings during 2007 and 2009. Another 0.28 lakhs seedlings are currently being planted.

2.2.1.5.5 Greening Kerala Scheme (Haritha Keralam Padhathi)

This is known as the people’s programme and aims to create woodlots in every Panchayaths in the State with full stakeholder participation. Unutilized lands in the village such as community lands, institutional lands, roadsides, railway-sides, riverbanks, areas surrounding ponds and lakes and other available private-lands including homesteads are targeted by the scheme.

The scheme is in two phases, the first phase was launched on 5 June, 2009 by Honourable Chief Minister of Kerala; and is implemented with support of Kerala Local Self Government Department. In 2009 about 31.4 lakhs seedlings were produced by Social Forestry Wing and distributed to all Panchayaths in Kerala for planting under the National Rural Employment Guaranteed Scheme.
The second phase, currently under implementation, has a wider participation and active involvement of the youthful and younger generation. It has resulted to more than 70 lakhs of seedlings being planted with the involvement of Panchayaths, school children, senior students, youth organizations, religious institutions, NGOs, media establishments, civil society organizations and individuals.

2.2.1.5.6 Palathulli (Many a Drops) Programme

‘Palathulli’ is a social campaign, started in Kerala during the year 2004 by Malayala Manorama Newspaper, aimed at promoting rain water harvesting and conservation of water. It is a creative campaign comprising road shows, video-photo exhibitions, seminars and media publicity. It conveyed effectively to 1.4 million people that water conservation and rain water harvesting are the solutions to drought and water scarcity in Kerala. The ‘Palathulli’ project aims to create awareness on water conservation and rainwater harvesting in educational institutions also. Over 1500 schools participated in the conservation programme. This project was launched by the newspaper to inculcate people with a new water culture which would preserve Kerala’s plentiful rainwater and protect rivers and other water sources from drying up. Exhibitions and video shows demonstrating various methods of water conservation were organized throughout the region and attracted huge crowds. A string of creative initiatives bear testimony to the impact of this campaign: colleges, schools and even fire stations have followed Manorama and built their own rainwater harvesting systems. For this, India has won UNESCO’s international award.

The environment related activities conducted in schools are listed below.

- Plantation of trees, their preservation and upkeep.
- Creation of Vegetable gardens and Medicinal gardens.
- Anti-plastic campaigns-eco friendly Bag making unit.
• Fodder-cultivation programme.
• Chlorination of village ponds and wells.
• Vermi-compost project in each unit.
• Popularization and construction of Gobar Gas Plants-use of non-conventional energy.
• Waste Management Programme - Land, Air & Water Pollution
• Rainwater harvesting.
• Kanikonna and Neem project in each campus.
• Kera Keralam project -10 coconut trees in each campus.
• Smokeless choolas in Rural Houses.
• Krishikootom-Organic farming & food security programme
• Sahayananam-Socio cultural mix programme
• Jalayanam-Water Conservation & Water source preservation programme aiming millennium goals of The United Nation Organization
• Jaivadhara-Wet land conservation and bio-diversity enrichment programme
• Aranyakam-Tree plantation programme aiming reduction of global warming
• Ushass-Cleaning programme
• Suchithwa Bhavanam-Health and Hygiene Programme

2.3 Section II: Life Skills Education: Pedagogic Strategies

There are many pedagogic strategies for transacting environmental education but the investigator selected the pedagogic strategies Cognitive apprenticeship, Role play, Brain storming, Debate, Concept mapping and Future’s wheel for making the study more compact. It is a well established fact that all learners do not possess homogenous personalities and learning styles. The heterogeneity in learners requires different strategies for teaching – learning process. Generally, the necessity of different strategies and method of
teaching is further strengthened due to division of knowledge into various disciplines and subjects, which cannot be taught and learned effectively through a single method. Each subject can be taught meaningfully by selecting an appropriate method of teaching out of available variety.

2.3.1 Criteria for selecting Pedagogic Strategies

Investigator extensively reviewed various teaching-learning strategies, analysed its merits and feasibility in the classroom. Based on the experience gained through review of literature and the discussion with experts investigator selected the pedagogic strategies and analysed its suitability to transact environmental education curriculum, feasibility in the classroom and potentiality to develop both life skills and environmental awareness.

The content selected for LSEM was environmental education. Environmental education provides conducive environment for developing life skills, by giving direct experience to students, emphasizing interactive pedagogic strategies for transaction of the content and provides a base for real life application of knowledge. The interactive pedagogic strategies such as, cognitive apprenticeship, concept mapping, role play, debate, future’s wheel and brain storming were recommended by researchers to transact the life skills education curriculum. The criteria for selecting a pedagogic strategy were-interactiveness: involve maximum pupil participation, feasible, develop higher thinking skills, retain information and suitable for the content to be transacted. The investigator have been chosen the following pedagogic strategies based on the criteria and explained in detail.

- Cognitive apprenticeship
- Brain storming
- Role play
- Concept mapping
- Debate
- Future’s wheel
2.3.2 Cognitive Apprenticeship

‘Cognitive apprenticeship’ was coined and articulated by Collins, Brown, and Newman (1989). Cognitive apprenticeship is a pedagogic strategy based on the situated cognition theory, socio-cultural theory of learning and Vygotskian constructivist approach to learning. It represents a shift from traditional psychological views of learning and encourages learners to immerse in the learning environment.

There are six teaching methods in cognitive apprenticeship. They are modeling, coaching, scaffolding, articulation, reflection and exploration. These teaching methods fall roughly into three groups: the first three (modeling, coaching, and scaffolding) are the core of cognitive apprenticeship, designed to help students to acquire an integrated set of skills through processes of observation and guided practice. The next two (articulation and reflection) are methods designed to help students both to focus their observations of expert problem solving and to gain conscious access to their own problem-solving strategies. The final method (exploration) is aimed at encouraging learner autonomy, not only in carrying out expert problem-solving processes but also in defining or formulating the problems to be solved. Through using the five teaching methods of modeling, coaching, scaffolding, reflection and articulation, the teacher can guide the learner down the path of becoming an expert by providing opportunities to succeed based on the individual need or previous experiences of the learner.

Cognitive apprenticeship usually commences with modeling guided by a teacher or experts. The teacher gradually decreases the support provided to students through scaffolding and coaching methods and increases students' autonomy through exploration. Learning not only involves teacher and student but also assorted others, such as other experts from the school, from the business and local community, and the electronic world community. Further, learning communities are dynamic in that members assume various roles at different times depending on the needs of the learner. For example, a
student may be a learner, instructor, or coach at any given time during the learning episode. In the process of learning, students must revisit what they have done and discuss their ideas with teachers and other students. Students finally discuss, demonstrate, present, and exchange their individual or group products and look back to analyze their own or others' performance and artifacts through articulation and reflection methods.

Fig. 2.2 Cognitive apprenticeship model

2.3.2.1 Modeling

A cognitive modeling strategy, with teachers and competent students serving as cognitive role models, is a key characteristic of cognitive apprenticeships. Modeling involves an expert's performing a task so that the students can observe and build a conceptual model of the processes that are required to accomplish it. The models should put their thoughts and reasons into words because students cannot otherwise monitor the thinking process. The model should give a mental model of the process so that the students can eventually work independently.

2.3.2.2 Coaching

Coaching consists of observing students while they carry out a task and offering hints, feedback, modeling, reminders, and new tasks aimed at bringing their performance closer to expert performance. Coaching may serve to direct students' attention to a previously unnoticed aspect of the task or simply to remind the student of some aspect of the task that is known but has been temporarily overlooked. The goal of coaching can be simply summarized as the learner accomplishes the learning goal. So, it can be said that coaching is the process of doing whatever it takes to assist learners in their learning, from the beginning to the end.
2.3.2.3 Scaffolding

The term ‘scaffolding’ means the type of assistance offered by a teacher or peer to support learning. These supports can take either the form of suggestions or help, cue cards, discussion slips or breaking the task into smaller more, manageable parts etc. When scaffolding is provided by the teacher, it involves the teacher in executing parts of the task that the student cannot yet manage. A requisite to such scaffolding is accurate diagnosis of the student's current skill level or difficulty and the availability of an intermediate step at the appropriate level of difficulty in carrying out the target activity. When the student takes responsibility for or masters the task, the teacher begins the process of “fading”, or the gradual removal of the scaffolding, which allows the student to work independently.

2.3.2.4 Articulation

Articulation is the actual process that a learner goes through to explain to other learners what problem solving activities have occurred. This explanation can also include future recommendations and perceived consequences. This process exposes the thinking processes of the learner. This could be done through discussion, presentation, or the showing of learner-produced artifacts.

2.3.2.5 Reflection

Reflection enables students to compare their own problem-solving processes with those of an expert, another student, and ultimately, an internal cognitive model of expertise. Reflection skills promote critical thinking and students' construction of knowledge. Articulation skills give students the ability to communicate that knowledge with others. These methods of instruction give students the opportunity to express what they are learning as it relates to their own learning experience and to self-evaluate their process.
2.3.2.6 Exploration

Exploration allows students to try out what they have learned with new situations. Students should be given a general problem, allowed to move into more specialized problems and be able to choose how to solve the problem for them. Students explore with the knowledge that they have been given and make new discoveries about problem-solving strategies. In exploration, teachers need to fade assistance gradually, allow students to work independently, provide general guidelines and encourage students to form their own problems and problem solving strategies. At this stage learners become independent of the model expert and begin to apply what they have learned.

The benefits of Cognitive Apprenticeship include – it encourages authentic activity and assessment, encourage greater levels of retention and transfer and facilitate higher order reasoning. The challenges faced are –it requires highly facilitative teaching skills, more time on task and results in higher levels of student anxiety and frustration.

2.3.3 Brain Storming

According to Alex Osborne, brain storm means using the brains to storm a creative problem and to do so in commando fashion, each stormer audaciously attacking the same objective. Brain storm is the free, uninhabited generation of ideas usually in group setting. The key to a successful brain storm is to provide an environment free of criticism where each person can present or state their opinions. It allows students to actively generate a broad variety of ideas about a particular topic or question in a given period of time. Quantities of ideas are the main objective of brain storming. Evaluation of ideas occurs later. During brainstorming the mind is stimulated to think without any inhibition and the ideas are accepted as they are. They are never rejected during the process of brainstorming but they are taken for comment and close scrutiny subsequently. Brain storming helps to assess prior knowledge, develop creative thinking, cognitive skills and inquiry building.
Procedure of brain storm starts by defining the problem or issue as a creative challenge before the students. Teacher selects group facilitator and recorder and fixes a time limit. Teacher ensures that no one criticizes or evaluates ideas during the session. Criticism introduces an element of risk for group members when putting forward an idea. This stifles creativity and cripples the free running nature of a good brainstorming session. Teacher makes sure that there is an enthusiastic, uncritical attitude among members of the group. Stimulate participants to give their ideas. Try to get everyone to contribute and develop ideas, including the quietest members of the group. This can be done in a structured manner where each person is asked to contribute ideas or alternately participants can freely callout their ideas. Teacher should encourage students to develop other people's ideas, or to use other ideas to create new ones. Record and display all the ideas exactly as they have been stated and eliminate duplication of ideas. When time is up, evaluate each idea with some criteria, like whether the idea can be useful in solving the problem, is it cost effective etc and select the best ideas. Scores can be given to the best ideas.

2.3.4 Role Play

Role play is an informal dramatization in which pupil acted out a suggested situation. It provides an excellent strategy for practicing skills, experience in how to handle a potential situation in real life, increasing empathy for others and their point of view and increasing insight in to ones’ own feelings.

There are two different kinds of role play. One kind involves having students act as if they were components of a physical or biological system. For example, you might have three students act as oxygen and magnesium. First, two students hold hands. They are an oxygen molecule. Then a spark comes along, to ignite the student who is acting as magnesium. Magnesium then takes one of the oxygen atoms, and the other oxygen atom is alone. You have had your students demonstrate a chemical reaction. A biology example would be to
have some students act as blood cells, and to move to different locations in the classroom, where students acting as different body organs give or take from the blood. The blood would attach to oxygen in the lungs, attach to food in the intestines and take oxygen for carbon dioxide at the cells.

The other kind of role play involves an ethical issue. Students act as humans in a situation where a decision must be made. Different students are given brief descriptions of who they are and maybe a description of their feelings about the issue. Then the students act out their roles and make a decision about the issue.

Role play can provide participation, involvement and the opportunity for learning by doing. Pupils act out real life situations or situations that could occur in real life in a protected environment. Their behavior, speech and feelings during the play form the basis of self appraisal and feedback from peers and teacher. By this process mistakes can be made and learned in a risk free way.

It is important to plan the role play in advance for its effective implementation. For this, teacher has to consider the available resources and the amount of time needed. Teacher should decide the learning objectives of the role play. Teacher divides the students into groups and given a theme for role play. Students choose a situation from reality that highlights the key concepts of the theme. After selecting a situation, various roles are identified and the students select different roles. Students are given the opportunity to familiarize their roles. It is important that participants in the role play understand clearly from the beginning what their roles are, how to interact with others and what is expected of them in terms of assessment. At last, evaluation of role play takes place.

Role play introduces problem situation dramatically, provides opportunity for people to assume roles of others and thus appreciate another point of view, and allows for exploration of solutions and provides opportunity to practice skills. But sometimes it lack realism and become too simple for that it loses credibility.
2.3.5 Concept Mapping

Concept maps were developed in 1972 in the course of Novak’s research program at Cornell where he sought to follow and understand changes in children’s knowledge of science (Novak & Musonda, 1991). Concept map is a device for representing the conceptual structure of a subject/discipline in a two dimensional form. It is a special form of a web diagram for exploring knowledge and gathering and sharing information. A concept map consists of circles or boxes that contain a concept and different concepts are connected with lines. Lines are labeled by lining words which describe how these concepts are related to each other.

Concept mapping is an effective pedagogic strategy used in classroom. The purpose of this strategy is to give workable strategies to help students ‘learn how to learn’. It is very helpful to teachers and students to generate ideas, integrate new and old knowledge, design a complex structure and assess understanding and diagnose misunderstanding. It will help to understand the concepts and principles of their disciplines and apply the knowledge to all aspects of life.

Concept mapping demands clarity of meaning and integration of crucial details. The process of constructing a concept map requires one to think in multiple directions and to switch back and forth between different levels of abstraction. In attempting to identify the key and associated concepts of a particular topic or sub-topic, one will usually acquire a deeper understanding of the topic and clarification of any prior misconceptions.

Initially, the hierarchical structure in concept mapping was strongly encouraged (Novak, 1998). However, chain maps, spider-maps, tree maps, flow chart and network maps can also be used. There is no strong agreement among researchers on the type of structure a concept map should have, although it has been acknowledged that the structure of a map should suit the content.
Procedure of concept mapping includes giving students the learning material pertinent to the lesson unit and are encouraged to identify the core or theme. The students are asked to construct good focus question relating to the study material. Focus question clearly specifies the problem or issue to be resolved. It can be formulated by asking questions like What is the central word, concept or research question focused in the lesson or problem around which to build the map? Then the students list out key concepts related to the problem selects most important/ inclusive concepts among them and place it at the top. The most general concepts are listed next, until all concepts in the lesson are rank ordered. The students are encouraged to find out good linking words to be written on lines connected by different concepts and the concepts from different domains are connected by cross links.

Concept maps helps to develop an understanding of a body of knowledge, explore new information and relationships, gather new knowledge and information and provides a visual image of the concepts under study in a tangible form that can be focused easily. It helps to achieve high quality and meaningful learning outcomes, help students learn how to learn. It can be used for pupil evaluations. They may be used as formative and summative evaluation tools to realize whether pupils have understood the concepts, relationship with the concepts and the topic as a whole. Concept mapping done in groups develops social skills and values like tolerance, respect for others’ views, group spirit, cooperation, open mindedness etc.

The demerits are- time consuming, result in frustration in students or they lost interest in the process because of difficulty in finding out the concepts and apt linking words.

2.3.6 Debate

Debate is a good strategy for dealing with controversial issues. In a debate the pros and cons of an issue are presented. This helps the student in taking a firm and rational strand on the topic under discussion. The issue for debate should have positive and negative aspects that can be argued for and
against by the students. While conducting debate in classroom teacher divides
the students to two teams, one will be in favour of the event or issue and other
against it. Initially, the students select speakers for the debate. The teacher
should chair the debate and take up a neutral position during the debate. The
speaker should stand in front of the main group and present their views in turn,
alternating between the teams. When arguments have been presented from both
sides, the chair person should sum up the points made by the students during
the debate and add points that may not have been covered by the speakers.

2.3.7 Future’s Wheel

Future’s wheel is a graphical representation of the causes and the
results of certain behaviors or problems. It clearly depicts the cause and effect
relationship of events and is used when the consequences of risky behavior are
to be brought out to the attention. Thus makes it a suitable strategy to transact
environmental issues. It emphasizes the future consequences so the name
future’s wheel.

Future’s wheel aims at identifying secondary and tertiary consequences
of events. The event is placed in the middle of a piece of a paper and then
small spokes are drawn from the centre. The problem wheel rolls into future
consequences which roll into other negative and undesirable situations.

The procedure of future’s wheel is initiated by giving a problem,
having identifiable causes and effects to the students. The students discuss in
their group on the root causes and steadily identify the effects of the problem.
The students map out the effects that emanate from the problem. Arrows are
drawn to show relationships and arrows drawn towards the problem gives the
causes and from the problem are the future effects. The primary effect is
shown by drawing single line from the problem and the secondary and tertiary
effects are shown by two and three lines respectively.

The future’s wheel diagram has strong visual impact and can enhance
understanding of concepts. It provides clear picture of complex problem. It is
used as a topic initiator, to expose prior knowledge and beliefs and also as an
indicator of knowledge construction and the unraveling of misconceptions
when used towards the end of the unit.
2.4 Conclusion

The theoretical overview helped the investigator to comprehend the concept of life skills education and its importance in school curriculum and various environmental education programmes practiced in the schools of Kerala. Review of interactive pedagogic strategies also helped the investigator while developing life skills education module. Theoretical overview made the investigator to select the pedagogic strategies – cognitive apprenticeship, brainstorming, role-play, concept mapping, debate and futures wheel for the module by realizing its suitability for developing life skills among students. This theoretical background also provides information that though there were many programmes at higher secondary level it is neither helping them to empower themselves nor to protect the environment from degradation. This made the researcher to develop a module on environmental education for enhancing the life skills. The theoretical overview is followed by a detailed review of studies of the variables undertaken for the study, which is presented in the next chapter.