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CHAPTER - III

THEORETICAL OVERVIEW

3.1. Chapter Preview

In this chapter, background literature related to the relevant concepts in this research study is included. Experiential learning, MI, Naturalistic Intelligence, relationship between experiential learning and naturalistic intelligence are discussed. Also the underlying theories are mentioned.

3.2. Introduction

Theoretical overview serves the purpose of stating as clearly and as concisely as possible the state of knowledge in the area in which the investigator proposed to work. It gathers together the various ideas in the field. Once this has been done, it is easier for the investigator to see what must be done to find the major gaps in the present knowledge.

3.3. Experiential Learning

The basic theory of experiential learning is anchored in the work of Dewey (1938), the interaction of knowledge and skills with experience are key to learning. Students learn best not by reading or learning in a closed room but by opening the doors and windows of experience. Experiential learning is a teaching methodology that uses meaningful practical experience to better understand course content and enhance the learning of abstract concepts. Through direct involvement with people and issues, students learn to apply their knowledge to real life situations. Through the field experience, students learn about different social and professional cultures by
working directly within these communities. As active participants, students will also share their knowledge, ideas and perspectives with members of the on-site community and their classmates.

The word Experiential essentially means that learning and development are achieved through personally determined experience and involvement, rather than on received teaching or training, typically in a group, by observation, listening study of theory or hypotheses or some other transfer of skills or knowledge.

3.3.1. **Principles of Experiential Learning**

- Learner is central:
  - The learner is central to the process throughout, and the facilitator provides the learner with a service. Learners have to be prepared to actively develop their understanding, critique and evaluate the messages in the context and then work hard to apply appropriate learning.

- Facilitation must be light and subtle

- A facilitator is not a pre requisite. Experiential learning involves people in working things for themselves and developing their own understandings. Although effective facilitation can add tremendous value, facilitators should remember that inappropriate facilitation can hinder rather than help learning.

- Create Experiential learning opportunities

- A facilitator should help create earning opportunities and enable others to recognize and make good use of opportunities. The facilitator can provide help during each element of the learning cycle by creating an appropriate learning event, providing an activity that will initiate the learning process,
creating an atmosphere and framework conducive to constructively critical review, ensuring that any conceptual thinking is progressed to meaningful conclusions and opportunities for improvement identified.

- Reactions to experiences vary, so don’t pre-judge
- We cannot predict the learning takes place in an individual from an activity because individuals take different messages from a single event. Therefore, one event can provide the individuals involved with quite different or even diametrically opposed learning.
- Single events can enable several different learning effects
- There is potential for experiential learning at several levels. There is a hierarchy of challenge that the facilitator can encourage the learner to address: realizing he need, developing the skill, developing the confidence/self-esteem, challenging personal attitudes etc.
- Build confidence before addressing attitudes and behaviour
- Developing basic skills in a supportive environment is relatively simple, if we have a positive attitude, and personal confidence, it is easier to implement personal change.
- The activity must be real and engaging – not based on artificial impact
- A learning activity is a means to an end, not an end in itself. The purpose of an experiential learning activity is to create an opportunity for valuable and memorable personal learning. The ideal activity will engage, stimulate and challenge with individuals becoming absorbed in the task as themselves. All activities must be designed, managed and facilitated carefully so that the activity has impact.
- Ensure activities allow adequate and meaningful reviews

- An effective activity provides the opportunities for learning with little destruction as possible.

- Careful reviews of activities are crucial

- The learning review is a vital stage of every activity. It should be planned as part of the design, not left to chance. The ideal review will involve the learner in personal thought, challenge and discussion before coming to some forms of conclusions. Real issues should not be swept under the carpet, but equally criticism must be constructive.

- Accentuate the positives

- Concentrate learning and reviews on the positives more than the negatives. It is equally beneficial to review what’s going well. It is not only motivating to recognize and focus on success, and seeking ways to make greater and wider use of it can reap tangible rewards.

- Use stimulating questions to reviews, especially for group discussions

- A review discussion is an opportunity for learners, helped by the facilitator, to develop their own understanding and draw their own conclusions. The role of the facilitator is to enable others to learn by drawing out the issues and developing the learning that is relevant to the individuals.

- Have faith in people’s ability to learn for themselves

- Always believe in the learners. They can and will make experiential learning opportunities work for them. One has to believe that the learners have potential to make progress and be committed to the fact that our role is to provide opportunities for others to learn and progress.
Experiential learning is different from academic learning, the process of acquiring information through the study of a subject without the necessity for direct experience. While the dimension of experiential learning is analysis, initiative and immersion, the dimensions of academic learning are constructive learning and reproductive learning. Though both methods aims in inculcating new knowledge in the learner, academic learning does so through more abstract, classroom based techniques, whereas experiential learning actively involves the learner in a concrete experience.

The word experiential essentially means that learning and development are achieved through personally determined experience and involvement rather than on received teaching or training, typically in a group by observation, listening, and study of hypothesis or some other transfer of skills or knowledge. We can also regard experiential learning as ‘growing a person from inside’ where as conventional teaching and training is the transfer of capability into a person from the outside. Experiential learning is controlled by the individual for the purpose of achieving personal development and growth where as conventional training and teaching tend to be designed and delivered by an organization for the purpose of developing the capabilities of a group of people, necessary to meet organizational needs or to achieve a known measurable output/result. In conventional teaching and training, the needs of the organization are the primary driver of the learning content, design, delivery and assessment but in experiential learning, the starting point is the person and so individual growth via experiential learning offer ways to address personal feelings of confidence, fulfillment, sense of purpose etc.

Experiential learning can be described as learning that arises out of reflection on experiences, leading to purposive action in order to test out the hypothesis that arise out of this reflection. This action in turn leads to further experiences and
reflection, so that experiential learning can be seen as a continuous cycle. This perspective on learning is called “Experiential” for two reasons:

- It has roots on intellectual origins in the works of Dewey, Lewin and Piaget
- Emphasize the central role that experience plays in the learning process

So learning is the process whereby knowledge is created through the transformation of experience. The essence of effective experiential learning is that the entire process is centered on the learner – not in the learning task, not in organizational objectives, not on assessment grades, not based on group norms and certainly not based on the teacher’s personal opinions. In this respect, the underpinning philosophy of Progressivism has much in common with the principles of experiential learning. According to Luckner and Nadler (1997), twelve reasons are there for the effectiveness of experiential learning. They are the following:

- Equality, Developing relationships quickly, Disequilibrium, Projective techniques
- Decreased time cycle, Meta learning, Chaos and crisis in a safe environment, Kinesthetic imprint, Common language, Encourage risk taking,
- Diversity of strength and Fun.

All these twelve aspects contribute a lot in individual development and experiential learning activities are selected and organized in order to bring forth all the needed components. An experiential educator’s role is to organize and facilitate direct experience of phenomenon under the assumption that this will lead to genuine learning – that is learning that is meaningful and long lasting. This often requires preparatory and reflective exercises.

Experiential learning has come to mean two different types of learning;
• Learning by yourself:

Learning by experiences by yourself might be called ‘nature’s way of learning’. It is ‘education that occurs as a direct participation in the events of life’. It includes learning that comes about through reflection on everyday experiences. Experiential learning by yourself is also known as ‘informal education’ and it includes learning that is organized by learners themselves.

• Experiential Education:

Experiential education is experiential learning through programs structured by others. Principles of experiential learning are used to design experiential education programs. Emphasis is placed on the nature of participants subjective experiences.

An experiential educator’s role is to organize and facilitate direct experiences of phenomenon under the assumption that this will lead to genuine learning. This often also requires preparatory and reflective exercises.

Experiential learning is constructive learning, where students are active learners, constructing their own knowledge with the help of the teacher. Such learning may involve one or more of the following instructional strategies:

• Experiments
• Field demonstrations
• Field trips/nature visits
• Focused imaging
• Games
• Model making
Experiential learning is inductive, learner centers and activity oriented. Personalized reflection about an experience and the formulation of plans to apply learning to other contexts are critical factors in effective experiential learning. The emphasis in experiential learning is on the process and not on the product.

### 3.3.2. Phases of Experiential learning

The phases can be viewed as a cycle consisting of five phases:

- **Experiencing**: here an activity occurs
- **Sharing or Publishing**: reactions and observations are shared.
- **Analyzing or processing**: patterns and dynamics are determined
- **Inferring or Generalizing**: principles are derived
- **Applying**: plans are made and use learning in new situation.

Experiential learning methods and strategies engage learners physically, mentally and emotionally in a multi-sensory experience. Simulations, visualization, dramatization, role plays and physical movements easily fall within this category, which is characterized by emotional stimulation and physical expression.

### 3.4. Theoretical Bases of Experiential Learning

Experiential learning is the process of making meaning from direct experiences. Aristotle once said, “for the things we have to learn before we can do...
them, we learn by doing them’. It is Kolb (1983), helped to popularize the idea of experiential learning by drawing heavily on the work of John Dewey and Jean Piaget.

Experiential learning is learning through reflection on doing which is often contrasted with rote/didactic learning. Experiential learning focuses on the learning process for the individual. An example for experiential learning is visiting a natural environment/habitat. Here one makes discoveries and experiments with knowledge, instead of learning and reading about other experiences. Experiential learning needs no direct teaching and relates solely to the meaning making process of the individual’s direct experience. Even though gaining of knowledge is an inherent process that occurs naturally, for a genuine experience to occur, there must exist certain elements.

According to Dewey (1938), “all genuine education comes about through experience; this does not mean that all experiences are genuinely or equally educative”. Academic theory in no way left out of the experiential learning philosophy. With the need for theory explained, it is important why experience is an important aspect of learning. “Students who use information they are trying to learn, who challenge and grapple with their new knowledge, to who use it to solve problems, tend to learn more effectively than students who passively read, memorize or merely absorb that which they have been exposed” (McKeachie, 1963). Dewey felt experience was a cycle of trying, One senses a concern, gets an idea, tries it out in an arena of applicability, undergoes or experiences the consequences, and confirms or reinterprets theory in the light of those consequences. In the best case, this process results in a reconstruction of experience, a re-codifying of habits, and an ongoing active questioning through further experimentation.
3.4.1. Criteria for selecting level of Experiences

When selecting and designing educational experiences, it is important to consider not only the level of involvement for each experience, but also the standards of quality for the experiences and the learner’s ability to respond.

Gibbons and Hopkins (1980), suggest five major modes of experiential learning, with each mode have the features of the previous mode plus a major increase in the richness of experiences.

- **Reception Mode:** Experiences are presented to learners, who remain as passive audience throughout the learning process.

- **Analytical Mode:** Learners conduct outdoor education and field studies in which they apply theoretical knowledge and skills in order to study some events, analyze some aspects of the environment or solve some problems.

- **Productive Mode:** Learners generates activities, products and services either assigned to them or designed by learners.

- **Developmental Mode:** Learners pursue excellence in a particular field by designing and implementing long term programs of study, activity and practice.

- **Psychological Mode:** Learners learn to understand themselves and their relationships with others.

According to Gibbons, in this hierarchy, as the degree of experiences increases, the learner takes on more responsibilities for learning.

Essential Elements of Successful Experiential Learning:

- Purposes reflect the learner’s needs
- Setting considered realistic by the learners
• A physical or psychological challenge is provided by the setting
• An appropriate degree of risk exists
• Diverse settings are integrated
• Provide learning experiences that are individualized, sequential and developmental
• Provide opportunities for unplanned learning from new experiences
• Instructor acts only as a facilitator of the experience
• Learner has active role in the planning and carrying out of activities
• Learner experiences numerous roles: as team member, leader etc
• Learner must claim responsibility for actions
• Interaction with social and physical environment
• Progress is monitored, assessed, and feedback is given to the learner
• Outcomes considered real and important

Experiential learning can take place in many different settings and have many objectives. Depending on the setting of the program, goals of the facilitator and participator, the situation in which they are involved and the outcomes attained, an experiential learning program may fit all learners. Dewey (1938) concluded that ‘all genuine education comes about through experience; this does not mean that all experiences are genuinely or equally educative”. Dewey felt experience as a cycle of trying. One senses a concern, gets an idea, tries it out in an arena of applicability, undergoes or experiences the consequences, and confirms or reinterprets theory in the light of these consequences. In the best case, this process results in a reconstruction of experiences, a re-codifying of habits, and an ongoing active questioning through further experimentation.
3.4.2. **Essential Elements of Successful Experiential Learning**

- Reflects the learner needs
- Setting considered realistic by the learners
- A physical or psychological challenge is provided by the setting
- An appropriate degree of risk exists
- Diverse settings are integrated
- Emphasis on a balance of action, reflection and application
- Provide learning experiences that are sequential, individualized, and developmental
- Provide opportunities for unplanned learning from new experiences
- Instructor acts only as a facilitator of the experience
- Learner have active role in the planning and carrying our of activities
- Learner experiences numerous roles in the learning process
- Learner must claim responsibility for actions
- Interaction with social and physical environments
- Progress in monitored, assessed and feedback given to the learner
  - Outcomes considered real and important.

Experiential learning engages students on critical thinking, problem solving and decision making in contexts that are personally relevant to them. This approach of learning also involves making opportunities for debriefing and consolidation of ideas and skills through feedback, reflection and the application of the ideas and skills to new situations.

3.5. **Experiential Learning Models**

Experiential Learning Cycle models emphasize that the nature of experience as of fundamental importance and concern in education and training. Experiential
Learning Cycles are commonly used to help structure experience-based training and education programs. For example, Experiential Learning Cycle models are amongst the most important pieces of theory used in many outdoor education programs.

Experiential learning cycles are models for understanding how the process of learning works. They are distinct from other models of learning, in two ways:

- Experiential learning cycles treat the learner’s subjective experience as of critical importance in the learning process. Experiential education principles, which are largely based on the educational philosophy of John Dewey (1938)

- Experiential learning cycles propose an interactive series of processes which underlies learning. Depending on the model, there is anywhere between one stage through to six stages of learning to be considered.

In many fields related to experiential learning, education and training, the underlying theoretical base is the idea that people can learn very effectively through direct, hands-on experience, as long as these experiences are well designed and facilitated.

It is the teacher’s responsibility to structure and organize a series of experiences which positively influence each individual’s potential future experiences. That is, ‘good experiences’ motivate, encourage, and enable students to go on to have more valuable learning experiences, whereas ‘poor experiences tend to lead towards a student closing off from potential positive experiences in the future.

Thus, experiential learning cycles can be seen as providing a semi-structured approach. There is relative freedom to go ahead in activity and ‘experience’ but the educator also commits to structuring other stages, usually involving some form of
Several experiential learning cycle models commonly in experiential learning literature have been identified, based on the number of stages they propose. Some models are discussed below.

3.5.1. 1-Stage Model

This model is simply saying that experience alone is sufficient for learning. The goal of education from this point of view then would be to structure and organize learning activities in which experiences themselves facilitate learning.

3.5.2. 2-Stage Model

This model states that, experiences followed by periods of reflection are an effective way to structure and facilitate experiential education.

3.5.3. 3-Stage Model

![3-Stage Model of Experiential Learning](image)

Fig 3.1 3–Stage Model of Experiential Learning

Two major forms of 3-stage models are there.
The simplest is experience-reflection-plan which suggests that following an experience and reflection, it is helpful to develop a plan for future experience.

The second 3-stage model is based on Dewey’s theory of experience involving “observation of surrounding conditions—knowledge obtained by recollection, judgment, which put together what is observed and what is recalled to see what they signify” (Dewey, 1938).

3.5.4. 4-Stage Model

This model is proposed by Kolb, based on Dewey’s philosophy. Here the 4 stages are experience-reflection-abstraction-experimentation.

There are many models that discuss the theory of experiential learning and one of the most recognized is that of Kolb. According to Kolb’s experiential learning model, learning, change, and growth are best facilitated by an integrated process that begins with:

- Concrete Experience: the tangible qualities of the immediate experience and the grasping of the knowledge that takes place
- Reflective observation: a collection of data through observation and critical thought regarding the experience
- Abstract conceptualization: the process of analyzing the data received and the internal process of developing concepts and theory from the experience
- Active Experimentation: a modification of behavior and knowledge occurs which the implications of the future are considered.
The completion of this cycle puts into practice the concepts and theories that have been developed through the reflection and conceptualization processes which in turn which create an environment for future experiences. The four stage model (experience-reflection-abstraction-experimentation) proposed by Kolb. Kolb drew on Dewey’s philosophy in proposing this cycle of experiential learning.

According to Kolb (1983), knowledge is continuously gained through both personal and environmental experiences. According to him in order to gain genuine knowledge from an experience, certain abilities are required. They are the following;

1. The learner must be willing to be actively involved in an experience
2. The learner must be able to reflect on the experience

Fig 3.2 4 Stage Model of Experiential Learning
3. The learner must process and use analytical skills to conceptualize the experience and
4. The learner must possess decision making and problem solving skills in order to use the new ideas gained from the experience.

3.5.5. 5 Stage Model

A Variety of experiential learning cycle models have been proposed by different educationalists.

- According to Joplin (1981), the 5 stages are: “focus-action-support-feedback-debriefing”
- According to Kelly (1995), the stages are: encounter-confirmation-revision-anticipation-investment”.
- According to Pfeiffer and Jones (1975), the stages are: “experiencing-publishing-processing-generalizing-applying”.

3.5.6. 6 Stage Model:

Priest and Gass (1997) describe a 6 stage model called the “The Experiential Learning and Judgment Paradigm”, which consists of the following 6 stages. “Experience-induce-generalize-deduce-apply-evaluate”.

Experiential learning can be a highly effective educational method. It engages the earner at a more personal level by addressing the needs and wants of the individual. Experiential learning requires qualities such as self-initiative and self evaluation. For experiential learning to be truly effective, it should employ the whole learning wheel, from goal setting to experimenting and observing, to reviewing and
finally action planning. This complete process allows one to learn new skills, new attitudes or even new ways of thinking.

According to Rogers (1994), experiential learning is significant learning where are cognitive learning is meaningless learning. The key to the distinction is that experiential learning addresses the needs and wants of the learner. According to Rogers, the qualities of experiential learning are:

- Personal involvement
- Self-initiation
- Evaluated by the learner and
- Pervasive effects on learner

According to Rogers, (1994), experiential learning means personal change and growth. He feels that all human beings have a natural propensity to learn themselves and the role of the teachers is just to facilitate the learning process. According to him, the roles of the teacher are as follows:

- Setting a positive conducive climate for learning
- Clarifying the purposes of the learners
- Organizing and arranging available learning resources for learners
- Balancing intellectual and emotional components of learning and
- Sharing feelings and thoughts with learners in a safe environment

So according to Rogers, learning is effective when the student participates completely in the learning process and has control over its nature and direction. Hence he recommends experiential learning strategies for effective learning.
Gibbons and Hopkins (1980) created a 10 layer ladder along which ‘degree of experientialness’ could be ranked. This ‘scale of experientiality’ appears to have some serious flaws, seems inconsistent with Dewey’s accepted theory of experience. According to Gibbons and Hopkins, the scale of experientiality was a ladder like or continuum model, illustrating how activities could be seen as varying in their degree of experientiality. This scale also falls prey to westernized hierarchical thinking in its metaphorical ladder promoting active experiences as inherently more valuable than passive experiences. Gibbons and Hopkins suggest five major modes of experiential learning, with each mode have the features of the previous mode, plus a major increase in the supposed fullness of experience involved.

An effective experiential facilitator is one who is passionate about his or her work and is bale to immerse participants totally in the learning situation, allowing them to gain new knowledge from their peers and environment created. The facilitators stimulate the imagination and keeping participants hooked on the experience.
3.6. Advantages of Experiential learning

- Teach the mind – tools and skills of life - Teaching the skills of life involves both mind and body ‘tools’ that range from communication and social skills to the micro skills of thinking and reflecting to the technological skills to be needed in the era of information.

- Challenge through the experience of doing - Learning is the function of experience and is shaped by internal processes that actually construct ideas in the mind, as well as by the external processes of social interaction. Specific strategies that abound in the constructivist classroom include hands-on learning with lots of manipulative and lab-like situations, co-operative tasks and frequent use and unique application of graphic organizers and authentic experiential curriculum.

- Target multiple dimensions of intelligence - the multiple intelligence theory taps into the unique profile of intelligences of each learner. The education community embraces multiple intelligence theory because it provides a natural framework for inspired practice.

- Transfer learning through reflection: The reflective use of learning is the cornerstone of experiential learning strategies. It drives personal application and transfer of learning. It makes learning personal, purposeful, meaningful, and relevant and gives the brain reason to pay attention, retention, understanding and remembrance.

- Safe Emotional Climate; Experiential learning methods provide safe and caring place for all learners, regardless of race, color, caste, aptitude and ability. Experiential learning strategies helps in tapping the emotional and moral intelligences, setting up the room to facilitate student to student interactions as
well as student to teacher interactions and incorporating learner-centered structures to foster the creation of intelligence-friendly learning communities.

- **Create a rich learning environment:**

  An ideal classroom resembles a children’s room in which students are repeatedly and implicitly invited to interact with the learning environment. In such a stimulus rich setting, explorations, investigations and inquiries are irresistible.

- **Teach the mind – tools and skills of life:**

  Teaching the skills of life involves both mind and body ‘tools’ that range from communication and social skills to the micro skills of thinking and reflecting to the technological skills to be needed in the era of information.

- **Experiential learning creates opportunity for students to engage and to apply academic understandings through hands-on experience, while simultaneously learning new information about the world around them.**

- **Experiential learning gives students the opportunity to take what they learn in classrooms and apply it to real world situations.**

- **Learning with experiences provides effective teaching by engaging the students desire to learn.**

- **Experiential learning is constructive learning, where students are active learners, constructing their own knowledge, rather than observing the demonstrative behavior of a teacher.**

- **Since here learning is based on rich experiences, students readily understand what they are learning and thus retain the knowledge to a greater degree than when merely having information presented to them by traditional teaching.**

- **Since learning is learner centered, helps in achieving personal growth**
Experiential learning strategies help a lot in developing skills- practical skills as well as interpersonal skills.

Helps in enhancement and reinforcement of academic learning by bridging theory and practice

It gives learners clarity of purpose and greater motivation for classroom teaching

Develops self-directed learning skills, self-confidence and independent decision making skills.

The vast majority of teaching and training in education and work continues to be conventional, narrow and highly prescribed- not Experiential. Teaching and training is oriented virtually exclusively to meet external needs, not individual’s needs and potentials. In work space and mainstream education the ‘whole life’ needs of people are effectively ignored. Properly organized and facilitated experiential learning, along with other appropriate strategies to developing people as individuals, can help enormously in attaining a balance in the ways we teach, train and develop and attempt to give to people the skills and emotional well-being we all need for a happy productive life.

Wilson and Heiemann (1991) identified the three learning objectives of work experience programs/learning through experience. They are:

1. Academic Objectives: relating theory to practice and strengthening and developing such cognitive skills as problem solving, decision making, critical thinking, application, analysis and synthesis.
2. Career Objectives: determining and testing career options, developing job acquisition skills, developing career planning skills, and understanding the world of work.

3. Personal growth objectives: developing self-confidence, self-understanding, communication skills, personal and ethical values, social interaction skills and a sense of professionalism.

The vast majority of teaching and training in education and work continues to be conventional, narrow and highly prescribed – not experiential. Teaching and training is oriented virtually exclusively to meet external needs, not peoples individual needs and potential. This is mainly because in education, commonly the needs of the organization are put before the needs of the individuals. Learners are not machines which can be programmed or filled with new skills or knowledge. They learn and develop in different ways and in different directions, if they can be given sufficient chance. Experiential learning, when used for student learning, can help in providing a positive emotional platform which will respond positively and confidently to future learning.

Experiential learning also brings into play the concept of Multiple intelligences – the fact that people should not be limited by the ‘three Rs’ and a method of teaching based primarily on reading and writing. Experiential learning is a way to break out of the received conditioned training and teaching practices which so constrain people’s development in schools and work.

3.7. Multiple Intelligence Theory

Intelligence is one of the most controversial topics in psychology. The concept if intelligence is too complex to define. A number of definitions have been evolved by psychologists according to their own concept of the term intelligence. The
theories of intelligence propagated by psychologists from time to time have tried to uncover the components or elements of intelligence. These theories can be grouped under two categories namely:

- Factor theories and
- Cognitive theories.

Gardner’s Multiple theory of intelligence comes under the cognitive theory category. Gardner stated that he did not believe in the existence of one form of cognition that cuts across all human thinking. Gardner observes that there are at least seven intelligences and each intelligence has autonomous intellectual capacities. According to him, the pre-requisite for human intellectual competencies must entail a set of skills of problem solving which enables the individual to resolve genuine problems or difficulties that he encounters. Multiple Intelligence theory allows one to assess the talents and skills of the whole individual rather than just the verbal and linguistic skills. This theory provides a more holistic and natural profile of human potential. Gardner first identified and introduced seven different kinds of intelligence in his book titled ‘Frames of Mind’ and later added the next two.

Gardner argues that we have eight different forms of intelligence each relatively independent of the others. He suggests that each of the multiple intelligence is linked to an independent system in the brain (Gardner, 1997, 1999). Although Gardner illustrates his conception of the specific types of intelligence with descriptions of well known people, each of us has these eight types of intelligences, although in different degrees. The nine types of intelligences described by Gardner are:

- Verbal/Linguistic Intelligence (Word Smart)
- Logical/Mathematical Intelligence (Number smart)
• Visual/Spatial Intelligence (Picture smart)
• Musical/Rhythmic Intelligence (Musical Smart)
• Bodily/Kinesthetic Intelligence (Body smart)
• Interpersonal /Social Intelligence (People Smart)
• Intra-Personal/Introspective Intelligence (Self Smart)
• Naturalistic/Physical World Intelligence (Nature Smart).

3.8. Naturalistic Intelligence

If we notice the world around us, everything functions in perfect harmony. The earth travels round the sun in exactly 365.25 days; the seasons change with precise regularity throughout the year, animals living symbiotically in a manner that maintains the subtle ecological balance and so on. It is only we humans who have gone against the principles of nature, and in the process, produced a host of ill effects that have severely damaged the environment and the lives of inhabitants. Leaving aside the harm caused to animals and wildlife, we can observe some of the greatest problems created to be those that damage our own lives. The plethora of diseases that have arisen in recent times – both physical and psychosomatic, are the direct outgrowth of our disregard for living in harmony with nature. Here comes the need to inculcate the values of eco-psychology and environmental consciousness in learners, and enhancing naturalistic Intelligence can contribute a lot in this aspect. Naturalistic intelligence was clearly of value in our present global scenario of environmental destruction and degradation.

Gardner has opened a new era of human intelligence. The most important characteristic of this era is the multiplicity and uniqueness of individual intelligence. His theory of Multiple Intelligences utilizes aspects of cognitive and developmental
psychology, anthropology and sociology to explain the human intellect. This theory was introduced in 1983, with Gardner's book “Frames of Mind”. He first established seven intelligences based on eight criteria:

- Isolation by brain damage/neurological evidence
- The existence of exceptional individuals
- Distinguishable set of core operations
- Developmental stages with an expert end state
- Evolutionary history and plausibility
- Susceptibility to encoding in a symbol system
- Support from experimental psychological tasks
- Support from psychometric research

As many educator’s know, Gardner’s initial work on redefining intelligence was that he could accurately pinpoint parts of the brain as these correlated to each described intelligence. Gardener’s list of multiple intelligences originally contained seven intelligences (linguistic, logical, visual, kinesthetic, musical, interpersonal and intrapersonal) and he later added Naturalist Intelligence to his list as the eighth intelligence in 1996. He designated site locations by using findings from research in neurophysiology. Howard Gardner’s theory challenges traditional, narrower views of intelligences. Previously accepted ideas of human intellectual capacity contend that an individual’s intelligence in a fixed entity throughout his lifetime and that intelligence can be measured through an individual’s logical and language abilities. According to Gardner’s theory, intelligence encompasses the ability to create and solve problems, create products or provide services that are valued within a
culture/society. Originally the theory accounted for seven separate intelligences. Subsequently with the publication of Gardner’s book “Intelligence Reframed” in 1999, two more intelligences were added to the list.

The key points in Gardner’s theory are:

- All human beings possess all nine intelligences in varying degrees
- Each individual has a different intelligence profile
- Education can be improved by assessment of students intelligence profiles and designing activities accordingly
- Each intelligence occupies a different area in the brain
- The nine intelligences may operate in consort or independently from one another
- These nine intelligences may define the human species.

Although this theory was not originally designed for classroom purpose, it has been widely embraced by educators in a variety of educational settings. Teachers have always known that the classroom is a heterogeneous group with students with different strengths and weaknesses. Gardner research was able to articulate and give directions as to how to improve a student’s ability in any given intelligence.

The Naturalistic intelligence, the eighth intelligence in Gardner’s list, has to do with observing, understanding, and organizing patterns in the natural environment. A naturalist is someone who shows expertise in the recognition and classification of flora and fauna. We are related to everything in the environment. Understanding the naturalist intelligence and cultivating it within our students is our responsibility not only as teachers but also as human beings. Dr. Howard Gardner defines a naturalist as
a person who recognizes flora and fauna plus other consequential distinctions in the natural world and uses this ability productively.

Naturalist intelligence deals with sensing patterns and making connections to elements in nature. Using the same intelligence, people possessing enhanced levels of this intelligence may also be very much interested in aspects related to environment and earth. Children possessing this intelligence may have a strong affinity to the outside world or to flora and fauna and this intelligence begins at an early stage of growth and development. They enjoy subjects, shows, and stories that deals with natural phenomena. They may also show unusual interest in subjects like biology, geology, meteorology, paleontology or astronomy.

People possessing nature smarts are keenly aware of their immediate surroundings and changes in their environment, even if these changes are at minute or subtle levels. They have heightened levels of sensory perception. These heightened senses may help them to notice similarities, differences and changes in their surroundings more rapidly then others. People with naturalistic intelligence may be able to categorize things easily. These people often like to collect, classify, or read about things from nature. Learners with naturalistic intelligence are usually explorers, experimenters, classifiers and ecologists who learn best by drawing conclusions upon known data. This could be anyone from a molecular biologist to a traditional medicine man using herbal remedies.

Students possessing this intelligence generally are good in science, especially biology. They often stand apart from the crowd, involving themselves in environmental issues. Children with outstanding naturalistic intelligence have such a big desire to observe the nature around them. It is evident from studies that this type of intelligence is
 actually in possession of every single person since they are born but its enhancement is based on the experiences and stimulation they obtained from their adults.

Multiple Intelligence theory shows promise in developing appropriate practices for children who do not fit the traditional mould. Teacher’s can use children’s different types of intelligences to assist in planning and teaching in areas in which they are not gifted. Schools and teachers however are not equipped to deal with multiple intelligence practices in classrooms.

3.8.1. Dimensions of Naturalistic Intelligence

Traits exhibited by children with Naturalistic Intelligence:

Children with high levels of naturalistic intelligence possess some core traits. The core characteristics are the following:

- Natural Orientation: Identification with organisms and their surroundings
- Attribute Orientation: finding common traits among items
- Categorization: identifying categories by attributes
- Hierarchical Reasoning: ranking items by significance and relationship
- Schematic memory: internalizing and recalling information by attributes, category or hierarchy.

Children with naturalistic intelligence may also exhibit the following characteristics:

- Have keen sensory skills – sight, sound, smell, taste and touch.
- Like to be outside or like outdoor activities like gardening, nature walks, field trips, observing nature etc.
• Notices patterns easily from other surroundings – differences, similarities, anomalies etc.
• Interested in and care about flora and fauna
• Notices things and events in the environment more rapidly than others
• Create, keep or have collections – scrap books, logs, specimens, pictures/photographs related to nature, journals etc.
• Interested in television shows related to science and nature.
• Shows heightened awareness and concern about the environment – endangered species.
• Easily learn characteristics, names and categorizations and data about objects and species found in the immediate natural environment.
• Are intrinsically organized and motivated
• Always demonstrate an empathy with nature
• Pick up subtle differences in meaning
• Enjoy sorting and organizing natural materials/specimens
• Impose their own sense of order on new information
• Respond to semantic mapping activities
• Makes consequential distinctions in the natural world
• Uses the naturalistic ability productively
• Likes to interest with animals
• Discerns patterns of life and natural forces

A Naturalistic Intelligence approach teaches topics, situations and functions from a new perspective. Hands-on learning maximally stimulates the five senses through lived, real-world experiences, and encourages students to engage in authentic,
meaningful communication as they discover nature. When considering the inclusion of Naturalistic Intelligence in classroom activities, teachers need to explore many aspects, including what kinds of activities would be most useful, how to encourage students to describe or observe the environment. Topics which nurture Naturalistic Intelligence should be identified from the syllabus. Teachers may support this development by using a number of strategies to explore the selected topics. Although excursions to natural settings are the most desirable option, this may not be practical, particularly in urban classrooms, due to cost, distance and potential risk of injury. Teachers may also consider the use of a variety of technologies to stimulate Naturalistic Intelligence.

Teachers should provide opportunities that encourage:

- Sensory observation
- Data collection
- Classification of natural objects
- Observation of animal behavior
- Gardening
- Recycling projects
- Out door studies /field studies
- Observation through microscope, telescope etc
- Photographing
- Journaling
- Making scientific instruments
- Designing experiments
- Nature walks
- Reading articles related to nature
• Preparing scientific papers
• Using graphic organizers
• Providing sorting and attribute grouping tasks
• Brainstorming categories
• Charting hierarchies
• Utilizing semantic mapping of ideas
• Building portfolios of student work
• Making connections to the natural world
• Modeling strategies for finding common attributes and hierarchies across the curriculum
• Designing experiments/projects
• Explore local natural environments
• Using scientific gadgets- telescope, microscope etc
• Visit to natural locations/fields
• Arrange environment related activities
• Writing and reading about nature
• Appreciating natures beauty
• Designing experiments
• Explore local environment
• Measuring and interpreting data
• Introduce various scientific instruments and how to use them
• Make collection of various natural organisms
• Relate everything they learn to nature
3.8.2. Incorporating Naturalistic Intelligence in Classrooms

There are two approaches for implementing Natural Intelligence theory in the classroom. One is a teacher-centered approach in which the instructor incorporates materials, resources, and activities into the lesson that cater to fostering of naturalistic intelligence. The other is a student-centered approach in which students actually create a variety of different materials that demonstrate their understanding of the subject matter. The student-centered approach allows students to actively use their varied forms of intelligences. In the student-centered approach, the instructor may incorporate aspects of project based learning, collaborative learning, nature studies, outdoor education, inquiry-based learning activities, and experiential learning strategies. The best approach is a right blend of both student-centered and teacher-centered activities into classroom learning.

Naturalistic intelligence can be fostered in students by emphasizing the need for well-rounded scientific naturalists: developing curricula that involve students in outdoor inquiry-based projects and helping students learn how to observe both the natural world and their own learning skills that are essential for developing expert naturalistic knowledge. Teachers can improve the naturalistic intelligence of students by giving these students opportunities to be involved in outdoor research activities. Time spent outdoors alone and among people with expertise in natural history, ecology, and conservation biology will have important influences on the knowledge and skills students learn, the careers they pursue and contributions they make to conserving Mother Earth’s Biodiversity.
3.8.3. Assessment of Naturalistic Activities

Assessment is one of the biggest challenges in incorporating Naturalistic intelligence in the classrooms. One of the main goals of integrating naturalistic concepts in the classroom is to increase student understanding of the material by allowing them to demonstrate the ways in which they understand the material.

After a depth analysis of the reviews and literature related to Multiple Intelligences and Naturalistic intelligence, the investigator prepared an assessment chart of Naturalistic intelligence activities. The details of the mode of assessment of naturalist activities are given in Table 3.1

**Table 3.1**

Assessment of Naturalistic Activities

<table>
<thead>
<tr>
<th>Activities / Strategies</th>
<th>Mode of Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Projects</td>
<td>Ask them to make a plan of action, design a project based on criteria and then implement it. Formal Assessment will be done, according to the accuracy of the information and evaluation of fully developed concepts.</td>
</tr>
<tr>
<td>Concept puzzles</td>
<td>Given a copy of the pictures, related to the concept to students, they work independently to number the pictures in a logical sequence-ask them to explain the phenomena. Assessment based on the accuracy of presentation and elaboration.</td>
</tr>
<tr>
<td>Enacting Plays, role plays</td>
<td>On selected topics – students work in groups to prepare short plays to enact for the class, based on the topic selected from text book. Assessment based on the Script, Performance of the students and Clarity in ideas.</td>
</tr>
<tr>
<td>Keeping Log books</td>
<td>Log book is for noting down the natural observations. Based on the richness of contents, accuracy of the concepts and logical presentation, grades are awarded.</td>
</tr>
<tr>
<td>Specimen Collection</td>
<td>Assessment is based on how they group the collected items and classify and organize the collected specimens, based on their characteristics.</td>
</tr>
<tr>
<td>Using scientific gadgets</td>
<td>Eg: Microscopes: As them to observe specimens under a microscope and ask them to draw and label the parts. (section of dicot stem). Assessment based on the</td>
</tr>
</tbody>
</table>
neatness in drawing and labeling parts accurately.

| Field visits | Visit natural locations and places where they can mingle with nature. Assessment is based on how they not down the needed observations and presents the matter in sequence. |
| Record sounds in nature | Assessment based on the variety and originality of sounds recorded. (That is, sounds produced by birds, wind, rain, etc.) |
| Writing stories, poems /songs | Ask them to compare with existing poems/stories, whether recite with proper intonation, related to the theme given etc. |

<table>
<thead>
<tr>
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<th>Mode of Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improvising models</td>
<td>Assessment is based on novelty of ideas, improvisation techniques, materials selected, originality in presentation etc.</td>
</tr>
<tr>
<td>Gardening</td>
<td>Land preparation, selection of plants, variety in selection, usability, beautification etc.</td>
</tr>
<tr>
<td>Preparation of power points</td>
<td>Assessment if based on set criteria’s: based on the theme, introduction and closure, logical presentation of slides, elaborations etc.</td>
</tr>
<tr>
<td>Concept maps</td>
<td>Ask them to prepare concept maps on selected topics. Assessment is based on the accuracy of information and also on the hierarchical elaboration of facts. Summative assessment is designed to determine what students know and do not know. Formative evaluation is designed to check on student’s progress.</td>
</tr>
</tbody>
</table>

3.8.4 Educational Implications for the Naturalist Intelligence

Developing the naturalist intelligence is no different than teaching other academic subjects or reading skills. Teachers must provide the opportunity for this intelligence to nurture. The quality of life on Mother Earth requires that our learners have experience with nature. We must provide the best educational learning opportunities for fostering Naturalist intelligence. Naturalist topics and themes make some of the best curriculum integrations that will help us to reach the goal. Topics that help enrich curriculum could revolve around the ecosystem where the learners
were able to gain first hand experience. The community environment can be best utilized in knowing and understanding the nature.

Another simple way to encourage the Naturalist Intelligence is to take students outside the classroom to explore the environment. One trip outside can generate enough questions for inquiry that a school’s library and laboratory could be utilized all year. Howard Gardner defines understanding as the capacity to apply knowledge in new situations. Providing for the Naturalist Intelligence is one way to encourage true understanding.

3.9. Relationship between Experiential Learning and Naturalistic Intelligence

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understanding. Here comes the importance of Outdoor Education and Experiential Learning strategies.

3.10. Discussion

Educators use the concept of different learning styles/models when creating lessons and activities to reach groups of diverse learners. The naturalist is one of the eight different learning styles derived from Gardner’s multiple intelligence theory, which claimed people have different aptitudes for learning. Natural leaders enjoy exploring nature and observing natural events, and rely on making observations and connections and relating the world around them when learning. As our children are smart in different ways with different potentialities and inborn talents, it is high time to identify and foster the learning styles suitable to them.