A REVIEW OF PRE-SCHOOL PERIOD VIA PLAY-BASED LEARNING – A STEPPING STONE TO LEARNING SCIENCE

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The paper underlines the importance of early childhood period as it is considered as the foundation period for all kinds of development. The author stresses that the teachers and parents should provide congenial environment to the children to explore the nature and the learning environment is enriched with the materials capable of arousing the natural curiosity of children. She concludes that children are naturally scientists. Hence, the learning environment should be simulative and enriched with natural play materials that can arouse interest of children for learning science concepts.

Introduction

The recent decades have observed the promotion of scientific literacy of young children from various educational reforms. (Siry, et al. 2012). The first five years of life is considered as the most critical period because it sets the foundation for all the development, viz., physical, mental, emotional, intellectual, language, etc. Moreover, it is the period in which curiosity to learn is unending thus laying the foundation of learning. Recent researches show that pre-school children are well prepared for learning science concepts and it is the right period to provide basic science concepts through quality learning experiences and exploration.

Gelman (1990) establishes that science knowledge acquisition is rapid during the early years. The natural environment serves as an ideal space for earning premature experiences of science. Children have the ideas, beliefs and explanations of a variety of science concepts that they observed or experienced in their daily lives. Through play way methods and their observations, they learn about size, shape, colour, living and non-living things and immediate physical environment that provide the foundation for learning physical science, life science, etc.

Inquisitiveness of Children Driven by Science

To different people, science means different things. For some it's a list of facts, for others it's a body of knowledge, including facts, concepts and principles (Carin et al. 2003). More than a list of knowledge and facts, it is a process of continuously exploring the nature known as scientific investigation.

Our knowledge and understanding of the world is improved by science. It helps the kids to develop an innovative mind and run positive change. A young child has lots of queries such as "why is the rainbow colourful?", "What gives sky the blue colour?" And so on, which becomes an essential reason why Science education in early childhood is important (Yoon, et al. 2006). Young children are always exploring and building curious questions inside their mind. The more their queries are

given proper scientific explanation, the more their thirst will develop.

The content includes the fact that science pursuits are socially and physically positioned which is all carried by science happenings all around and the positive enthusiastic engagement of the child. An important state in this perspective is that the emerging knowledge of children is a continuous and under way process (Larsson, 2013), in which the focus is the expressed interests of children in the phenomenon occurring all around and the science involved with it.

Significance of Sciences at an Early Stage

Buckleitner (2002) pointed out the major benefits of learning science at early childhood which are life-skills development, inculcation of love for science, literacy and language development, encouraging enquiry and important thinking and enhancement of decision-making skills.

Science helps the students in some of their vital life skills development such as analytical approach to things, problem solving ability, good communication skill and so on. All the experimental results in science are not quick; some takes time to show the result which in turn teaches patience and perservance to students. Science has relevance in our everyday life so it is the most important subject a child can learn.

In the next decade an estimated 75 per cent of jobs within the fastest growing industries would require science, technology, engineering and arithmetic (STEM) skills. As a result, there has been a robust emphasis on STEM education in schools to organise students for the longer term. Science educators are fortunate therein they need a singular opportunity to instil a love for science within the early years, just by harnessing a child's natural curiosity. Creating amazing science experiences in early education will inspire children to require finding out more and exploring on their own.

Often young learners struggle to include detail into their writing. Scientific reporting encourages the young learners to write down accurate description of what they see and observe, a practice they can apply to all other forms of writing.

Enquiry and methodology are integral to science education and practice. Through scientific enquiry, the study of science enhances critical thinking skills which will be applied to any area of learning. Critical thinking cultivates curiosity and is important to understand and solve problems. It allows children to seek out meaning in their learning and make real-world connections that impact their lives.

Science teaches children to not take information without any consideration. It helps them separate fact from fiction. Children are taught to hunt information from multiple sources and to believe evidence to work out truth. This process provides a solid foundation for them to have independent opinions and take decisions, a skill that will serve them well throughout all facets of their life and academic pursuits.

The pivot is constructed as: "The preschool should endeavour to make sure that each child is able to develop his/her understanding of science and its relationship with nature, it should also include knowledge of plants, animals and simple chemical processes

and physical phenomenon." (Adbo, K., Vidal Carulla, C., 2020)

Measures of Government to Promote Literacy for Children at Pre-school Stage

The Government of India has had under consideration a national Early Childhood Care and Education (ECCE) to reiterate the commitment to promote inclusive, equitable and contextualized opportunities for promoting optimal development and active learning capacity in all children below the age of six years (ECCE Policy, 2013).

The members of the National Focus Group on ECE unequivocally agreed to call it the National Focus Group on ECCE rather than ECE. Within the context of the work of the National Focus Group, the rationale for replacing ECE by ECCE is as follows:

The period from birth till eight years of age is known as early childhood in a child's life, a period that presents a developmental continuum. The opposite reason for extending the span of infancy from six to eight years is to make sure a gradual and smooth transition from preprimary to primary education, which may be a structured and formal learning system requiring effective interface. The term 'care' has been added in recognition of the very fact that young children need care and nurturing. Additionally, to their health and nutritional needs, their psychosocial and emotional needs even have to be met adequately for his or her holistic development. Education is a process of acquiring learning, skills, habits, etc. It also indicates a crucial focus, viz., to organise the young child to enter the formal educational stream/system.

Thus, the term ECCE refers to a philosophy of providing opportunities/experiences to young children aged up to eight years so as to mark their holistic development, also as arranging and providing services and support systems to communities and families to satisfy the requirements of their young children. For the sake of convenience, and for purposes of programming and institutional location, ECCE is often divided into three sub-stages: birth to 2+, 3 to 5+, and 6 to 8+. Each sub-stage is often located during a different institutional setting.

The 86th Constitutional Amendment Act, 2002, which effectively releases the state from its obligation to provide care and education for kids below six years, is noted as a negative development.

The report cites a fragmented approach and divided responsibilities as reasons for this grim situation. It can be concluded that ECCE must be introduced within the framework of EFA and UEE, with accountability for all programmes for teenagers above three years lying with DEE & L, while programmes for youngsters below three years are going to be the responsibility of DWCD.

Play-based Learning is Purposeful Learning

The assumption that play is a frivolous use of classroom time and in opposition to rigorous instruction demeans its value and its vast potential (Harlen, 2001). "Many people, including some educators, believe that we need to choose between play-based learning opportunities and rigorous academic standards when integrating the two is very possible," says Concordia University-Portland adjunct professor, Angie Stratton. "For

example, a kitchen/cooking center could contain a water level also as measuring cups, dishes and 'pretend' food. Paper and pencils/ crayons/markers, etc., are often wont to write recipes, make lists, and make advertisements for a replacement restaurant (Martin D, 2003). The creative possibilities are endless. Not only does this play-based learning center address language arts standards, but it also touches upon speaking and listening standards as well."(Harlan, et al. 2004)

The designing of activities and the teaching-learning processes in preschool settings are specially accounted in play-based learning. During the early childhood education days, play is visualised as 'the foremost part of expansion of knowledge in the preschool years' which in turn supports emotional, social as well as intellectual developments. (Vygotsky, 2016)

Imagination is the Key

An important aspect of learning in play-based settings is imagination. Hedegaard (2016) defined the former as the interaction between a school's practices and the children's motive orientation. Imagination provides the idea to children to separate their emotions from events and activities. This is an essential part of learning and is the source of creativity that helps humans to 'imagine what they cannot see, conceptualise what they hear from others, and think about what they have not yet experienced' (Fleer 2015, p. 39).

From this view of the perspective of holistic development of children, the fact of an imaginary situation can be regarded as a path to developing abstract thought (Vygotsky 2016, p. 20). An important part of providing children with new experience is the transfer or sharing of experience from others to them but facts like raising questions about if, how, what and why of activities should also be included. It will help the children to extend their thinking beyond direct sensory experiences.

Ways for Play-based Learning

Markezich (1996) explains that the activities cover a range of scientific topics and utilize a variety of formats, often incorporating learning from other areas such as language, numeracy, and artistic and physical development. Examples include the following:

- Observing behaviour of safely contained items, for example, beads in plastic bottles.
- Handling and observing behaviour and interactions between substances such as oil and water, corn flour and water, corn flour and oil, and milk and washing liquid and using food colouring to enable these observations.
- Exploring density by investigating whether objects float or sink in a variety of different liquids.
- Making colour spinners or compartmentalised colour sorters.
- Using static electricity to move tissue paper shapes.
- Using creative activities to facilitate discussion and learning about the items being made. For example, making spiders with egg boxes and pipe cleaners.

Natural learning experiences for children are generally set by adults. Hence, it is their

responsibility to provide an interesting and rich environment to the children. The environment should be designed in such a way that the children get opportunity to learn through concrete experiences by using their sense organs. The teachers' understanding and approaches to science have deep influence in developing scientific curiosity among children. The learning environment should be simulative and enriched with natural play materials that can arouse interest of children for learning science concepts. There should be ample scope for observation and experimentation.

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