Ecology and Inclusive Education

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Abstract

The concept of 'ecology' has been thoroughly researched in the past, but the possibility of its applicability in inclusive education is something that is yet to be explored in depth. The ecological lens has been significant in the education sector to understand and assess the learning behaviour and outcomes of students in a classroom environment. Here is an attempt to comprehend the diverse multiple perspectives of ecology in the diaspora of inclusive education. Through this paper, an understanding has been developed that this ecological lens has not been utilised in varied contexts (like the relevance of ecology in developmental research) of the teaching-learning process for Children With Special Needs (CWSN). Keeping in mind the nascent awareness and acceptance of inclusion in the field of education, the paper explores the significance of ecological orientation in educational practices.

INTRODUCTION

Ecology has its origin in biological sciences where it has been understood as the study of living organisms and their functioning in the natural world. But this understanding also alludes to a certain degree of interconnectedness and dependence on each other for survival, which has been further applied in the education sector.

This interdependence has been researched widely in various forms and types. For many years, ecology as a concept has been associated with its biological underpinnings, although this paper examins ecology with respect to its application in the education sector. It thrusts upon the application of ecology in the education space, as well as the interface and relevance of ecology

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for inclusive education. The primary purpose of the study of ecology is not hypothesis-testing but the discovery, that is, the identification of those systems, properties, and processes that affect, and are affected by, the behaviour and development of the learner.

To fully understand the impact of quality of teacher-child relationships on children's achievement, relationships must be studied using ecological-contextual models of development (Pianta and Walsh, 1998). This paper intends to explore the relationships between these processes and systems of ecology and inclusive education.

Extensive research has been conducted on the culture of schools and classrooms but there is a dearth of studies on the ecology of education. There is literature available though not enough to show the importance of ecological approach in the education of children. The existing literature further shrinks when we want to study the learning behaviour of Children with Special Needs (CWSN), that too in the Indian context. Special needs mainly arise under two conditions—one due to impairments and another due to positive discrepancy from an accepted norm on the potential continuum. Since classroom ecology and its relation to inclusive education of CWSN has not been researched adequately, this paper attempts to explore the interface of classroom ecology which will impact the pedagogical practices for teaching Special Educational Needs (SEN) children in inclusive classrooms.

Ecology: The Concept

What do we mean by the term 'Ecology'? The Oxford Dictionary describes ecology as 'the relationship of living things in relation to their environments' (Hawkins, 1998). Webster's New World Dictionary's meaning of the word 'ecology' is 'the complex of relations between a specific organism and its environment' (Neufeldt and Guralnik, 1994). Ecology can be described as a science that deals with the relationships of organisms with one another and with other factors that make up their environment. The concept of ecology originated from the discipline of biology. According to the biological understanding of ecology, it is a scientific study of the relationship and interaction between living organisms and the environment. Bronfenbrenner (1977) defined the bio-ecology system as the environment of a human that includes their own biology, their immediate environment, their larger social context, and the interactions among these contexts. There is a 'circular' mutuality in the biological notion of ecology, but in educational set-ups it prevails in terms of 'supportive' mutuality, i.e., of parents, teachers, students, and school administrators (Matusov, 1999). They are united by the common problems of learning and teaching. Accordingly, 'the environment and classroom

relationships in the classroom ecology vary along four dimensions: resource richness, number of students and aids, time and duration of lessons, and grouping patterns (Brint, 1998). The epistemological notion of ecology argues to view the total group as one and whatever happens in it is a cumulative effect altogether and not due to individual contributions.

Bronfenbrenner's theory in 1976 was an analytical tool for understanding individual development within a complex social system. Every person is developed within many deeply interconnected rings of influence (Hess and Schultz, 2008). Bronfenbrenner system (1977 and 1979) named the four interconnected rings encircling the developing person as the macrosystem, microsystem, mesosystem, and exosystem. Recently a fifth system has been included—the chronosystem, which accounts for the temporal aspect of the developmental research (Santrock as cited in Clark et al., 2020). Traditional models of development typically focus on stages, for example, biological, cognitive, or physiological states, or an individual's environmental contexts. Bronfenbrenner (1988) proposed to move from these simplistic models of development to consider the advantages of the more complex ecological models, wherein the individual is fluid and moderated by an interplay between the characteristics of the person and the structures of the environmental context yielding positive or negative influences and effects. The model is constituted of five systems to explain the influence of environment on the development processes of a human being.

The theoretical propositions of Bronfenbrenner (1988) shifted from only focusing on environmental influences to developmental processes of individuals' experiences over time. His theory has been used to link psychological and educational theory to early educational curriculums and practice. At the center of the theory is the developing child, and all that occurs within and between the five ecological systems are done so as to benefit the child in the classroom (Guy-Evans, 2020). Some of these benefits include strengthening the development of the ecological systems in educational practice as a result of good communication between parents and teachers. According to the theory, if parents and teachers have a good relationship, this should shape the child's development in a positive way. Likewise, the child must also be active in their learning, engaged both academically and socially. They must work as a team with their peers and get involved in meaningful learning experiences to enable positive development (Guy-Evans, 2020).

Analysing different conceptualisations of ecology, the underlying premise of ecology is a symbiotic relationship between the actors and the environments

which try to comfort one other by accommodating and having shared understandings and meanings. Mutually a natural balance is created within the ecosystem to support one another. Basically, it is the survival instinct, which guides the concept of ecology being obvious and natural. This is what happens in a exactly real life situation. Therefore, studying ecology provides a comprehensive view of a particular situation as compared to other approaches. The physical aspects that have been ignored definitely play a determining role in what exists. This aspect has been well documented by several researchers viz. Eggleston (1977), Peck et al. (as cited in Gaylord-Ross,1989), and Bowers and Flinders (1993). A study to analyse the distinctive function and role of the specialist teacher across settings in helping to facilitate an appropriate balance of curriculum 'access' was conducted. The ecological systems theory of development by Bronfenbrenner (as cited in McLinden and McCracken (2016) was used to examine the dual model of access within and between different 'systems' in a complex 'ecology of inclusive education'. It was found that this theory had the advantage of not only focusing on the characteristics of the learner but also the complexity and multidimensional nature of the influences on development. The distinguishing characteristic of symbiotic relationships in ecology can be examined in the education sector, wherein a classroom can be seen as an ecosystem in which the teachers and students would be the actors interacting in the school environment. The conventional understanding of ecology fails to acknowledge the physical aspects of a classroom which play a crucial role in determining the learning of students. Therefore, it is highly relevant to explore the use of ecological orientations in educational settings.

Ecology and Culture

Bowers and Flinders (1993) have explained classroom ecology 'as a complex pattern of action, interaction and relationships.' However, some researchers viewed ecology from a narrow perspective. Tagiuri (as cited in Boyd,1992) conceptualised ecology as one of the four dimensions while defining school context. She viewed the ecology of a school as consisting of only inorganic elements, namely, resources available, physical arrangements, scheduling patterns, school size, demographic shifts, working conditions, and local, state, and federal policies that emphasise more on the physical elements of ecology. The social dimensions have been treated separately as a part of school culture or milieu or social system. Similarly, another sociologist Brint (1998) has delineated 'ecological' features of the classroom (such as the number of students in class, the way instructional time is divided, and the methods of grouping students as one of the important aspects of the classroom life, the other two being the

bureaucratic setting of mass schooling and the prevailing instructional culture. He had proposed classroom ecology as different from classroom culture naming it instructional culture. The dynamic aspect of ecology, the continuum of actions and interactions, and the feather of mutuality distinguish it from culture. The vital role of the physical part of 'ecology' and dynamism of interactional processes created between the physical and non-physical aspects of the contextual environment differentiates it from 'culture'.

Ecology of Education

The Process-Person-Context-Time (PPCT) context model wasn't adopted in most development research as Bronfenbrenner (1988) explained its relevance 'to make possible the analysis of moderating and mediating processes that constitute linkages between and within the environmental systems shaping the course of human development'. This paradigm incorporates a key domain having equal status as the environment, which includes a set of factors that contribute to the development of biological and psychological characteristics of the persons involved in the process. In most developmental research, the differentiating characteristics of the person were left unspecified unlike in the process-person-context model. The conception of the environment and the dynamic relation between person and situation implied in the ecological understanding of education draws heavily on the learning theories of Kurt Lewin (1935, 1936, 1948, 1951), as explained by Bronfenbrenner (1988). Lewin stated that 'each person exists within a field of forces and this field, to which the individual is responding or reacting to, is called his life-space'. The influence of this life space is what constitutes the ecology of a classroom. Thus, Bronfenbrenner (1976) reformulated Lewin's equation to add the learning processes to focus on the behaviour of learner and research beyond the behaviouristic paradigm to include the person in developmental research along with context in the person-process-context model.

Recently in school reform studies, other than looking only at human resources, physical resources and the mutual interactions between physical and human resources have gained ground in determining and studying how these aspects affect different educational performances (Eggleston, 1977, and Peck, Richarz, Peterson, Hayden and Wandschneider as cited in Gaylord-Ross, 1989). The ecological approaches take into account other aspects like social/political contexts along with the pedagogical ones (Eggleston, 1977; Peck et al. as cited in Gaylord-Ross, 1989; Guralnick, Kochhar and Gopal as cited in Lynch, et al., 1997). It provides a further explanation to understand children's learning experiences. It is based on an understanding that in different

locations, human beings take on different patterns of behaviour, lifestyles and accept different patterns of achievement. This meant that the locations are given and unaltered.

Peck et al. (as cited in Gaylord-Ross,1989) from their research study on integrated preschool programmes developed an ecological process model and identified three categories of concerns or needs perceived by parents, teachers, and administrators for their successful implementation and survival. The three most crucial and distinct needs thus noted were— adequate preparation for integration, potential loss of control over programmes and children represented in shifts to from a more integrated programme arrangement, and availability of adequate resources for operating high-quality integrated programmes. On the other hand, Eggleston (1977) viewed the ecology of school as 'an organic, dynamic environment of individuals with a fine balance of forces operating within it'. His model explained the ecology of education as 'an ecology of shortage, even scarcity of resources' and therefore emphasised resource management more. Stressing the need aspect of ecology, Mishra, Sinha and Berry (1996), in their cross-cultural study on Adivasis in Bihar, have clearly written that 'the basic proposition of the ecology element is that human organisms interact with their physical environment in ways which seek to satisfy their needs.' Similarly, Quinn (as cited in Eggleston,1977) has equated ecology as the study of human adjustment to the physical environment.

The study on the community of learners conceptualised the ecology of an innovative school with four models of community maintenance (Matusov, 1999). One of the four processes and the corresponding abstract model, described was the ecological model wherein members of the community develop different but compatible ways of doing things. It was noted that 'compatibility is based on an ecological synergy of the diversity, mutual tolerance, adjustment and open-endedness of development of the ways of doing things' (Matusov, 1999). The ecological model is based on the principle of mutuality and support. It was argued that in this model, everybody works towards an 'ecological zone of community comfort' which is akin to Vygotsky's (1978) 'zone of proximal development' for learning concepts as cited in Matusov (1999). In this zone, people cross the boundaries of their skills and participate in various activity for example, press help each other learning. Learning takes place via an expansion of a newcomer's ecological zone of community. The multifaceted character and advantages of this model lie in having ecological zones of comfort involving many participants at a time, unlike the other models which only focus on personal zones of comfort. The focus on ecological zones of community sets apart Matusov's model from other models, which only

take personal zones of comfort into consideration.

Besides academic learning, it helps in developing values like providing and nurturing friendships with the children, becoming a group member rather than just being an ideal or leader member, and the emergence of characteristics of a group as a whole rather than of individuals. The ecological approach promotes the enhancement of positive energy amongst the mutual relationships of actors in the groups. It is the total aggregated outcome of these group processes, which forms the ecology. However, there isn't enough research literature to study the ecological perspective while teaching children with special needs in educational settings particularly for Indian classrooms.

Guerrettazs and Johnston (2013), suggested that the framework of ecology, with its emphasis on affordance and emergence provide a compelling lens through which we can study the ways in which materials are actually deployed in classrooms, and how teachers and students conceive of the work being done there. The crux is the interactional aspect and the symbiotic relationship, which are the distinct features of ecology. The ecological approach aims to promote the enhancement of positive energy amongst the mutual relationships of the actors in the groups. The above-mentioned ecological features play an important role while teaching children with special needs and leave a lasting effect on their learning process.

Bronfenbrenner (1976) gave three aspects of experimental ecology of education. First, he noted that, in contrast to most educational research, the ecology of education is not and cannot be confined solely to the investigations in strictly educational settings. Second, the ecology of education cannot be confined solely to the conditions and events occurring within a single setting, rather equal emphasis must be given to the relations obtained between different settings. Third, an ecological model emphasises the conceptualisation of environments and relationships in terms of systems. Implicit in this injunction is the recognition that the relation between person and environment has the properties of a system with a momentum of its own; the only way to discover the nature of this inertia, and its interdependencies, is to try to disturb the existing balance.

The learning standards are an essential component of the ecology of a classroom. According to Dusenbury et al. (as cited in Vasquez, 2012), 'learning standards create uniformity and coherence in education by establishing and communicating priorities, and providing a common language and structure for instruction within subject areas'. When standards are taken seriously, they become the plan or blueprint for instruction, shaping and influencing what happens in the classroom. Studies by different Indian researchers on ecology by Saraswati

and Dutta, 1988; Mistry and Dutta, 2015; Khalakdina, 2011; Saraswathi and Oke, 2013, and others have mainly focused on the different aspects of lifespan development but not much on the educational aspects. Saraswati and Dutta (1988) adopted ecological perspective to investigate the socialisation process of children in poor social conditions of urban and rural India. Mistry and Dutta (2015) studied ecology to highlight the advances that have been made in addressing the conceptual, theoretical, and methodological challenges in actualising the integration of culture into the study of human development. Khalakdina (2011) studied ecology from the perspective of analysing human development and behaviour in India. Saraswathi and Oke (2013) have focused on the ecology of adolescence in India. Thus, learning from different complexities of processes comprising the ecosystem, the aim of this paper is to understand the relevance of ecological approach for inclusion of children with special needs in the educational setups.

Ecological Approach to Inclusive Education

The journey to consciously educate students with special needs from an inclusive school perspective started in the 1990s and still, new possibilities are being explored to effectively implement this approach. Ainscow (1999) defined 'inclusion as a process of increasing the participation of pupils in, and reducing their exclusion from the cultures, curricula, and communities of their local schools, not forgetting, of course, that education involves many processes that occur outside of schools'. There are several authors who have documented the obvious need for inclusive education of SEN children. Here the acceptance of children's needs by the educational system requires attention. Lipsky and Gartner (as cited in Thomas, 1997) have noted that unlike in the readiness model by Piaget and related theorists, inclusion of special needs children is about the acceptance of educational setting to prove its readiness. The new model is situated within the interactionism perspective where the dynamic role of environmental interaction is vital in the way it responds to the needs of children. To illustrate this point, Dyson and Millward (as cited in Pijl, Meijer and Hegarty, 1997) wrote about the shift in paradigm in special education from psycho-medical to interactive or organisational paradigm. The readiness of the organisation's structure and function to respond well to individual needs of SEN children is the underlying premise for inclusive education. The Special Educational Needs (SEN) children in the present article refer to all the children defined in the Rights of Persons with Disabilities (RPwD) Act, 2016. Judging on the developments for SEN children, policy reviews, and actual achievements in

practice, inclusion seems to be the probable way ahead. It promotes quality education for all children, not for SEN alone. The concept of inclusion in practice is not very old, but there is increasing evidence of its implementation. Jangira (1991) pointed out the need of education for all children with disability under the Government of India's Education for All (EFA) programme, where most of them will be educated in general schools Curriculum as well as by compulsion. Staub and Peck (1995) interpreted, after reviewing a number of studies, curriculum that purposes of inclusion are highly relevant to the needs of all children. Baker, Wang and Walberg (1995) conducted early research on inclusion and found that the classification and placement of special needs students in non-inclusive environments have been ineffective and discriminatory. It was recommended that placement for special education should only be given when the Special Educational Needs (SEN) are accurately classified and non-inclusion shows better results.

Hegarty and Thomas (as cited in Thomas, 1997) analysed the research studies on having or not having integrated education, and concluded that there is no clear-cut evidence for or against integration. A major international review of literature on integration for the 'Organisation for Economic Cooperation and Development (OECD, 1998) concluded that 'while (the inadequacy of comparative research) means that any inferences drawn must be tentative, the absence of a clear-cut balance of advantage supports integration.' The reasons for being so are the methodological problems associated with this type of study, for example, the impossibility of randomly assigning pupils to treatments, for getting firm and clear findings. There has been enough research evidence otherwise, to demonstrate that children with diverse needs have gained a lot through mainstream school rather than in a segregated school placement (Staub and Peck, 1995; Baker, et al., 1995; Casey, 1988).

There are several authors who have documented the need for conducive ecology in order to promote inclusive education. Jangira (1997) noted four major reasons for the need of inclusive practices in India after reviewing and writing the trend report for research in the area of special education. In the light of universatisation of elementary education, the scarcity of school in remote and rural area restricts the supply of educational services for both SEN and non-SEN children.

Furthermore, the major mentions for neglecting the children population in SEN segment includes their low retention, underachievement scores, in equity in investments with school's inefficiency in responding to diverse needs of all children.

Recognising the varying needs of children and the inclusive philosophy

of 'Schools for all children', agencies like the research and disability unit of 'Save the children fund' and 'Education Committee of Disabled People's International' expressed that education is same for everybody whether SEN or non-SEN, and each of us has different needs (Mackey and McQueen, 1998). The major thrust is how and why the placement of SEN, in different educational settings determines their learning. On similar lines, Jangira (as cited in NCERT, 1997, pp. 495–508) also expressed the need for research and study on 'the ecology of classrooms having SEN children'. Heward and Orlansky (1988) has noted in their book that the work of Rhodes and his colleagues has proposed six categories of models for educating emotionally disturbed children. One of them is an ecological model stressing on interaction of the child with the people around him and with social institutions. They have well documented that many researchers supported the effectiveness of the ecological and behavioural models. The effectiveness of these models lies in their characteristic feature of analysing and modifying the ways in which a child interacts with the environment. Quite a number of studies (Gaylord-Ross and Peck; Guralmick; Rick and Cooke; Semmel, Gottlieb and Robinson; Strain and Kear as cited in Gaylord-Ross, 1989) noted that other than pedagogical variables such as intervention type, personal attributes, heredity, intelligence, curricular design of classroom environments, including social/political and personal contents logistical needs of parents, teachers, administrations highly influence in forming social ecology of the classroom. Through these variables also judge the effectiveness of integrated educational arrangements yet they have received very less attention. Similarly, Eggleston (1977) also substantiated this point to recognise the importance of economic, political, and social characteristics of locations for searching an explanation for different students' responses and outcomes. These may not be related or even in conflict with a child's direct educational needs.

Kochhar and Gopal (as cited in Lynch et al., 1997) have noted that it is not vital to focus only on individual deficits or environmental of deficits, but rather it is a commitment of an ecological approach towards educational development and shared responsibility within communities for the healthy development of all children. The question about why there is a need for inclusive schools can be answered with the simple reason that it would benefit not only students with special needs but also the students without special needs. To illustrate the need for an ecological approach for inclusive classrooms, one can say that as Bronfenbrenner (1988) emphasised on mesosystem, where the development of a child is built on her/his interaction with the surrounding settings like family and school, and the teaching strategies

that play a crucial role in an inclusive classroom. This participation should be in the process of making decisions, beginning from their admission in the system to the expectations carved out for them, and of course the nature of systemic engagement that is provided to them. A constant interaction is required between the teachers, parents, and special educators along with the children, to inform them on any planning that is done for each child, rather than deciding what they should study, based on a set of pre-determined assumptions (Ranganathan, 2020). Thus, ecological approach means having a constant interactional classroom environment and shared space to support each others' learning. Lastly, a few Indian studies as described in the account before, could be traced to substantiate the importance of employing ecological dimensions for educating SEN in Indian classrooms, which calls for a need to pursue extensive research in this area.

Conclusion

The explanation above has shown that the influence of processes and functions for creating favourable ecological space facilitates effective inclusive practices. It may be concluded that the study of classroom ecology is an inpending assessment topic that can contribute to further modifications in the education sector with respect to the learning environment in the schools. Especially, the influence of ecology on a child with disability has been found to be fundamental to her/ his academic as well as social and emotional development. It has been found that after understanding the views of available literature, there is a need to conduct more research to employ ecological approach for inclusive education, especially in the Indian context.

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