

Childhood Learning and Education: A Focus on Intuitive Learning

Review Article

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Abstract

Findings of early cognitive expansion have led investigators to recognise the developing mind as astoundingly competent, active, and intuitive from an early age. For emotional, cognitive, social, and physical development, the first eight years from birth are crucial. As billions of mixed neuronal circuits are built by the interplay of heredity, environment, and experience, a child's developing brain is highly malleable and adaptable throughout these formative years. Intuitive learning plays a significant role in teaching, learning, and leadership, and theorists have recognised its role in scientific and artistic discovery. Education and intuition are the creative pathways to creativity. Incorporating intuitive learning into the educational system is crucial for adopting a holistic approach to thinking. Intuitive competence aids in creative thought processes in dynamic, networked or distracting workplaces. The present review is an attempt to understand the potential of intuitive learning in the context of childhood education and its future implications.

Keywords: Cognitive; Childhood; Intuitive; Education; Learning

Abbreviations

ECCE; Early Childhood Care and Education; ECD; Early Childhood Development.

Introduction

The initial years of childhood, encompassing the period until the age of 8 years, play a key role in the development of cognition, social skills, emotional well-being, and physical growth. During these years, a child's newly developing brain is substantially plastic and responsive to transformation as billions of mixed neural circuits are formed via the interaction of environment, genetics, and experience. It has been well noted that optimum brain development demands a stimulating environment, adequate nutrients, and social interaction

with attentive caregivers [1]. The foundational framework of the brain develops through a continuing process that commences before birth and extends into adulthood. The sequential pattern in which the brain matures provides windows of sensitivity that are particularly susceptible to environmental influences. Basic vision and hearing are the first sensory pathways to develop, followed by early language skills and higher cognitive functions. It is a pattern of connections that proliferates and prunes in a prescribed order, building upon earlier, simpler circuits to create later, more complex circuits [2] (Figure 1). Thus, the brain's sensitivity to learning occurs in three broad waves, i.e. sensory, language, and higher cognition, which also parallels the sequence of emerging behavioural skills and milestones [3].

Early childhood development (ECD) is a maturation process

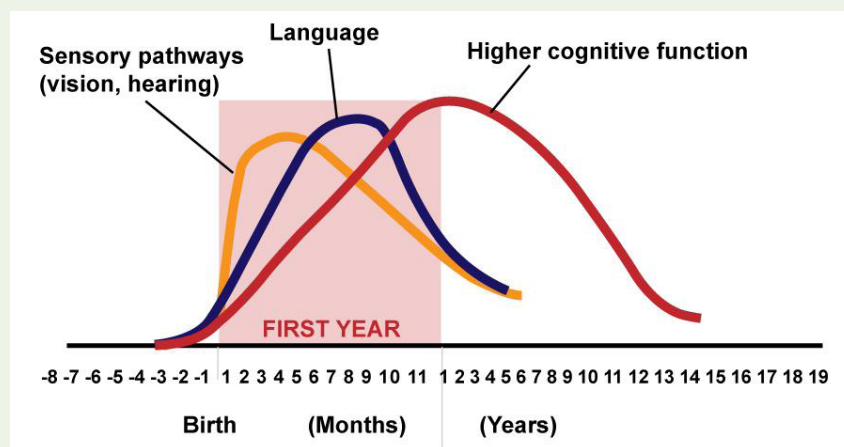


Figure 1: Neural connections for different functions develop sequentially [2].

that occurs in the first few years of life and involves the growth of motor, cognitive, linguistic, and socioemotional skills. There is a delay when a child does not meet developmental milestones in any area of functioning at the anticipated age [4]. Additionally, early childhood experiences impact brain architecture to such a great extent that they can establish either robust or fragile foundations for lifelong learning, behaviour, and well-being [1–8]. (Figure 2) shows the interconnected areas of child development and initial learning and how each domain facilitates and jointly assists learning and development in the others [7].

Findings of primary cognitive development have led investigators to recognise the progressing mind as remarkably capable, active, and intuitive from the early years. General cognitive processes are linked to learning abilities including engagement and perseverance [7]. It is noteworthy to mention that learning occurs in two forms, i.e. explicit learning, which is an intentional, conscious, and declarative process of knowledge acquisition, and implicit learning, which is a form of incidental, unconscious, and procedural knowledge acquisition [9]. The process of learning begins at the prenatal stage. As soon as they come into the world, children are ready to learn, and they actively absorb information. One striking discovery about young infants is that they construct their intuitive plots of certain cerebral functions from the initial years of life. Furthermore, it is well studied that from birth onwards, children's minds are operational and curious, and early thinking is intuitive and complex. Numerous foundations of refined forms of learning, particularly those critical to intellectual accomplishments, are laid during these initial years of life. A child's developing theory of mind transmutes how they interact with people and what they learn from them. Infants and young children begin to recognise what goes on in people's mindsets, and how someone else's feelings and judgments are comparable with and inherent to them [7].

Beginning of Intuitions in Early Life

Children are not inactive observers who register the superficial manifestation of things at an early age. Instead, they build explanatory systems – implicit theories or schemas – that help organise their

knowledge. Implicit theories encompass causal principles and relationships; these concepts assist children in clarifying, reasoning, and predicting significant events and, in some instances, interfering to change them [7]. Initially, infants possess a relatively simple understanding of the mind. They are conscious of some basic features: what people are looking at is an emblem of what they are attending to; individuals act intentionally and are goal-oriented; people have positive and negative emotions in reaction to their surroundings; and they possess varied perceptions, have different acuities, objectives, and feelings. Children contribute to this mental atlas as their awareness broadens. From an early age, developing a theory of mind has a profound impact on everyday communal exchanges. This influences how children learn, interact with others, evaluate morality, and form their self-identity.

Preschool children also are intuitive and experiential and learn by engaging instead of imagining things out “in the head”. Before entering formal, goal-oriented schooling, preschoolers gain a vast breadth of arithmetical informal knowledge and intuitive thinking. Young children are exposed to events in their daily lives that help them develop abilities, concepts, methods, representations, viewpoints, structures, and operations related to a wide scale of arithmetical concepts [10]. Studies focussed on assessing the intuitive and informal knowledge in preschoolers postulated that children aged 4–6 years convey a stable informal perception of guessing an outcome for a desired task. It was further highlighted in these studies that children at these ages appear to have prior instincts about probabilistic ideas. These outcomes sustain the assumption that preschoolers have the cognitive capability and intuitions to retrieve simple concepts of probability, notably the chance of events [10–12]. Intuitions emerge early in life, and they are linked to networks in the brain and comprise different sets of genes [13, 14].

Intuitions can originate in formal and informal situations, although intuitive thinking is primarily connected with informal knowledge in the early years. Before formal schooling, young infants are required to assess the chances and unpredictability of a task

and make probability judgments to a certain level [10]. Intuition is vital in teaching, learning, and leadership, and theorists have long recognised its relevance in scientific and artistic discoveries. From the above discussions, the significance of intuitive learning cannot be underestimated during the early years of life. Thus, integrating such learning abilities may be a vital component of Early Childhood Care and Education (ECCE). An effective early childhood learning programme that can ensure appropriate chances for holistic learning is warranted [15]. The present review article is an attempt to understand the potential of intuitive learning in the context of childhood education and its future implications.

Intuitive Learning vs. Analytical Learning

The term “intuition” is a conceptual workhorse that describes a wide variety of occurrences. The Latin root of the word, *tueri*, translates to “to look at or towards, to contemplate” or “to look upon” and *intuitus* to “the act of achieving knowledge from direct perception or contemplation” [16]. Moreover, it has been well documented that intuition is the examination of internalised, condensed knowledge. In addition to this, some of the broad key aspects associated with intuitive learning are as follows: [13, 16–19]

- May improve the impudence in avoiding rigidity and the (uncritical) usage of routines, as well as drive the search for novel and elegant problem-solving activities.
- Leads to solutions that are not attainable through analysis and strengthens decision-making capabilities within complex, ambiguous, or uncertain conditions.
- Plays a critical role in structuring children’s fundamental knowledge of the world and supporting the acquisition of new causal structures.
- Intuitive perception allows one to open up to the latest information and a multilevel spectrum of creativity, particularly valuable for making judgments, assessments, and decisions in scenarios where there is limited time or when a decision needs to be made with only incomplete information.

Intuition and analysis are sometimes represented in opposition, which can be a helpful approach to understanding how each of these modes works. Latest ideas and breakthroughs emerge from the interaction of intuition and logic regularly. Table 1 elaborates on the difference between intuitive and analytical learning skills [16]. Despite differences, intuitive and analytical learning styles complement each other. It is the equilibrium between sensing and intuition that makes it feasible to apply the who legamut of rational and emotional insight and judgment for overall activities [16–19]. Nevertheless, intuition

Table 1: Difference between intuitive and analytical learning skills [16]

Aspect	Analytical learning	Intuitive learning
Speed	Slow	Fast
Mode	Explicit	Implicit
Cognitive approach	Intellectual	Creative
Emotional bias	Limited interference	Subjective
Process	Linear	Nonlinear
Clue integration	Step by Step	Holistic, synthesising from multiple sources

is called a “sacred gift” and the rational mind a “faithful servant” as the very interplay between intuition and logic helps generate new thoughts and creativity repeatedly [17].

It is fascinating to know that intuition has been discovered to be necessary for cognitive methods, such as heuristic-based decision-making, innovation, and learning. Intuition seems to be reliant on double hemispheric inferior parietal and caudate structures of the brain. Functionally and neurally, intuition is strongly correlated to the development of expertise, heuristics, and generation of effective ideas during the stages of preparation and incubation [20, 21].

Evidence to Support That Children Are Intuitive Scientists

The learner as an intuitive researcher, creates and tests assumptions about the world providing a fruitful model that enables one to understand the underlying cognitive growth [22, 23]. Children’s intuitive theories are shown to develop significantly in the preschool years in a variety of areas, such as biological transmission and contagion psychosomatic events [19]. A study involving 4- to 6-year-old preschoolers aimed to investigate whether children tend to choose informative actions and draw precise conclusions from the results of their intrusions in a causal learning task. The findings indicated that young children indeed exhibit a preference for informative interventions and successfully make precise inferences based on the end results of their actions in a novel causative system. The findings suggest that young learners can grasp the principles of informative experimentation well before they can articulate these strategies in explicit scientific tasks [23]. Children’s intuitive theories, like scientific theories, are developed, tested, and rationally amended in such a way that integrates their prior knowledge with new evidence [19].

Another study reported that young ones at an intermediary phase of the intuitive theory are mostly determined to discover domain-relevant information. When they know just enough about something to be fascinated but not so much that they lose interest, they are more likely to learn more about it. This optimum amount of existing knowledge may establish a maximal amount of uncertainty and curiosity in children and encourage them to learn more [19]. It is further established that infants may already be born with explorative abilities and knowledge about objects around them and may have an innate ability to envisage the behaviour of objects and substances with which they engage and relate. The intuitive knowledge of physics is believed to be present, which is persuaded in children by playing and allowing them to constantly interact with objects [24, 25]. Several studies have highlighted the fact that children have robust intuitive math capabilities before they begin formal math education [26]. It has been stated that pre-schoolers obtain a widespread array of mathematical abilities before entering formal, goal-oriented education. One such study examined preschoolers’ intuitive understanding of the chances of events in a probabilistic task with spinners. Participants, at the age of 4–6 years, were tested on their predictions of the most likely outcome before and after an instructive session of reasoning. Findings revealed that children at the age of 4–6 years convey a stable informal understanding of foretelling an outcome as more likely. Children at these ages seem to acquire prior intuitions involving probabilistic models. These results suggest that preschoolers possess the cognitive abilities and intuitive

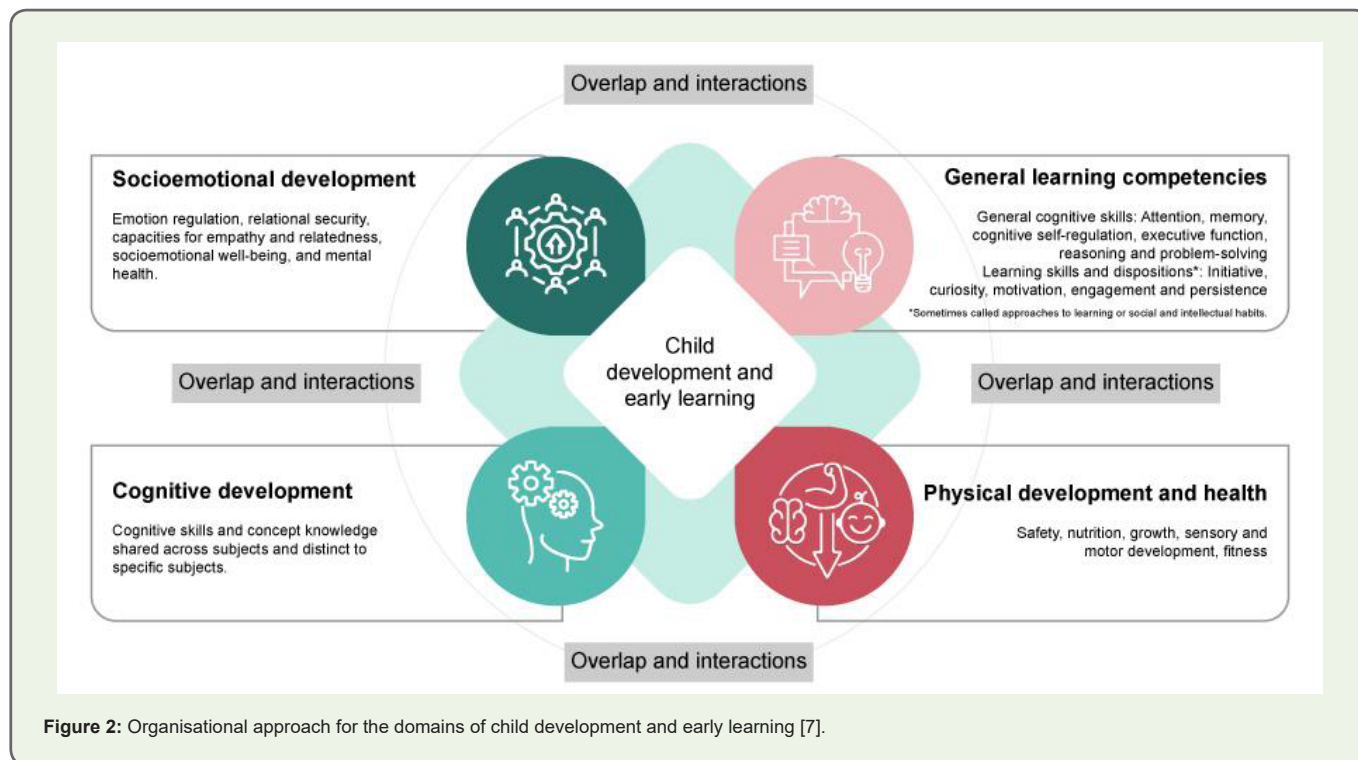


Figure 2: Organisational approach for the domains of child development and early learning [7].

understanding to grasp fundamental concepts of probabilities, especially in relation to the likelihood of events [12].

In an interesting finding, it was noted that 2-year-olds intuitively used mathematical concepts, such as probability, to understand things around them [27]. In another study that examined the consequence of evidence conflicting with preschoolers' naive theory on the forms of their unrestricted exploratory play, it was found that all children who noticed conflicting evidence performed an unconfounded (free from state of confusion) informative experiment at the beginning of their play. Outcomes showed that children in the conflicting condition enacted more size experiments than children in the confirming condition. Children who were confronted with theory-violating evidence planned experiments to validate their theory. Pre-schoolers were more flexible when it came to performing diverse types of experiments. But they were less flexible when it came to their investigations. They could design experiments that were clear and devoid of confounding variables. However, they lacked the ability to switch the focus of their research and frequently drew wrong conclusions from the tests they conducted [28].

The ability to grasp causal connections through the observation of imperfect evidence is regarded as a valuable social learning mechanism for toddlers. Mostly, children learn about causal relations amid objects by viewing the acts of others. Studies have suggested that children as young as 2 years of age can make use of observational causal learning from probabilistic contingencies [29]. They use their sensitivity to statistical models to discover the causal structure of the physical world at an incredible speed despite the uncertain evidence they receive. The ability of toddlers to act on the physical world – to create and conduct their intercessions based on observable probabilistic evidence –

provides them with a stout structure for learning many sorts of causal linkages, involving culturally unique aspects [29].

Encouraging Intuitive Learning in Children: Opportunities and Challenges

Einstein rightly stated, 'Education is that which remains when one has forgotten everything learned in school' [17]. The propensity to underestimate young children's cognitive abilities persists throughout the preschool and kindergarten years. In one study, preschool instructors, and other professionals in consulting, educational research, teacher tutoring, and educational advancements underestimated children's accomplishments by six to eight times. This underestimation signifies a missed chance that can hinder the development of children. In this regard, it is important to inculcate intuitive learning in the education system to have a balanced thinking approach [7].

Education should concentrate on creating a generic climate that encourages intuition. Whether it is to cultivate the internal receptivity that allows people to identify intuitive experiences in the first place, or to cultivate an environment that recognises intuition as valid and valuable and encourages people to share intuitive content, educating for intuition requires an attitudinal shift, including receptivity to the unconscious and imagination. To prepare children for lifelong learning, it is important that teaching includes the modelling of intuitive insights, self-acceptance, open-mindedness, anticipation for learning, curiosity, and persistence. A simple model explaining the types of intuitive thinking and the pedagogical approaches that could be integrated in to the 21st-century classroom is presented in (Figure 3) [17].

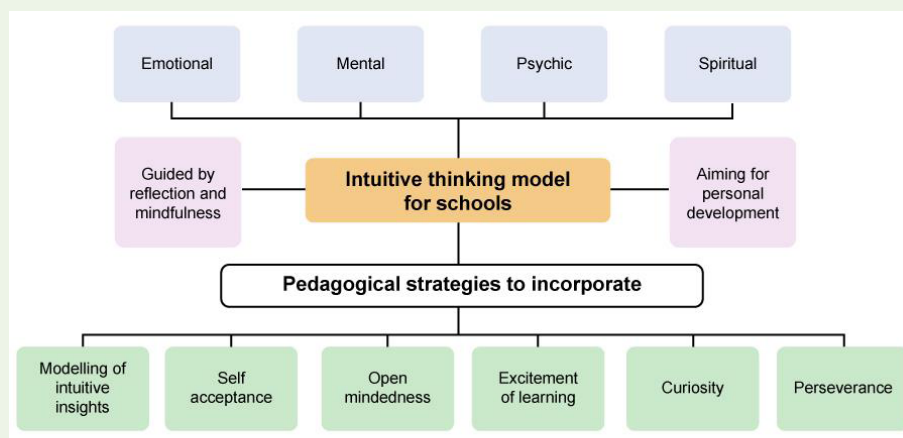


Figure 3: Models to promote intuitive thinking [17].

Education and intuition are the creative pathways to innovation. Intuition may help leaders think about possibilities that have not yet materialised, and with the ability to see the big picture, move organisations forward through innovation [18]. Intuition may be especially useful for making judgements, assessments, and conclusions when time is limited or when a decision must be made with just partial information. In other words, intuition is important when cognitive processes are less functional [16, 30]. Educating intuition entails fostering a mindset that believes in the intuitive function's potential as a valued source of knowledge. Most intuition education programmes focus on normalising the potential of intuitive function and raising students' awareness to recognise intuitive experiences when they occur. Students of intuition acquire techniques for more easily accessing subconscious content, and training for intuition should also include experience in determining when it is appropriate to guess, as well as how to judge the plausibility of hunches [30]. It is important to highlight that student of intuition must learn to withstand ambiguity and the discomfort of (temporary) uncertainty as it is vital for a successful intuitive function. Early in childhood, the intuitive mode is frequently compromised when adults choose to communicate falsehoods instead of the challenging truth to children. To counter this, teachers may provide students with examples of when intuition was wisely used to positive effect. Another aspect of the development of intuitive learning can be achieved by the development of sensitivity to non-rational processing, which can happen naturally or can be fostered via practice [16, 31].

Education for intuitive learning may also include the expansion of a depth of experience in a particular field, acquaintance with a broad range of knowledge, or immersion in the problem, project, or situation. This is because intuition is sometimes supported by the acquisition of expertise or immersion in a problem [16, 32]. Simple practices such as deep breathing, which is a key to keeping calm, increase receptivity towards intuition [16]. It has been highlighted that breathing leads to a gradual easing of physical tension in the body, promoting increased internal awareness and a momentary mental disengagement from daily concerns [16]. These practices

are mostly a part of holistic classrooms; however, incorporating contemplative, mindful practices is a possible approach to including intuition development in pedagogical practice. Developing introspective self-awareness to be a part of intuitive education has been proposed in several research studies. It is important that teachers engage students in discussion and consciously model practical maxims and rules of thumb to form habits. It has been noticed that students do not remain novices forever and that they create intuitive conjectures or spontaneous creative or athletic actions through processes that they cannot explain, even with urging. For these and other reasons, it is critical to keep intuition alive in the classroom of 21st-century learners [17]. Many pieces of advice for purposefully building intuition contradict traditional teaching and learning practices. Biases against intuition pervade schooling structures, and these biases have effectively excluded intuition from formal education [16].

There is an argument that intuition influences human decision-making outside of consciousness [33]. Intuitions are implicit and operate subconsciously and automatically. Intuition occurs 'when a person concludes with less explicit information than is normally required to reach that conclusion.' Intuitive knowledge is, therefore, regarded as unreflective knowledge and permits concluding with less existing and necessary information. Hence, intuition differs in this regard from cognitive and metacognitive processes that demand attention and working memory capacity [33].

In many aspects, the intuitive attitude is similar to that which fosters creativity; therefore, recommendations for strengthening intuitive function will be similar to those that promote the imaginative and creative process more broadly [16]. In addition to a positive attitude towards intuition, fostering openness to non-rational processing, a state of mind that can occur spontaneously but can also be nurtured with practice, is an important aspect of intuition growth [16].

Failure to appreciate the magnitude to which children interpret facts via the lens of their lay ideas can lead to learning techniques

that generalise material for youngsters. The belief that young children are “concrete” thinkers, unable to deal with abstraction or reason hypothetically, causes educators to focus on simple, descriptive activities, depriving children of the opportunity to progress their conceptual frames. Fabricating impactful materials in a realm requires understanding children’s beliefs, causal principles, misconceptions, and knowledge gaps, and then using validated steps to improve their conceptual framework [7].

Implications of Intuitive Learning for the Future

Intuition frequently possesses a vibrant, “feel good” aspect that immediately adds to the value of life [34]. When understood and effectively managed, intuition-as-expertise and intuition-as-feeling can be powerful forces in complex and fast-paced business environments and improve executive decision-making abilities by developing finely tuned intuitive intelligence [31]. The use of intuition is also well perceived in medical education. The usage of intuition can be well observed in this field as most of the decision-making is conducted under conditions of uncertainty [35].

The conscious practice of developing intuition is inseparable from the transformative process of becoming more psychologically mature, which researchers have termed as “individuation”, making the unconscious conscious. Both the inner potential of the individual and a more receptive relationship to the larger world that we all collectively inhabit are fostered by intuitive development practices. Contemporary writing on intuition and education recognises intuition as an asset in contexts like teaching and leadership. It serves as a beneficial counterbalance to an overemphasis on rationality and analysis in learning modalities and beyond. The presumptions we hold about intuition can affect our efforts to develop it. However, a lack of theoretical comprehension regarding intuition should not impede educational interventions aimed at fostering intuition development. It is time to reconsider our belief in and interest in educational intuition [16]. According to supportive research, the finest jobs in the global economy are currently going to so-called “knowledge workers” who can address ill-structured problems in impulsive ways by associating real-time information flows with existing knowledge to generate rapid new intuitive vision [17].

In dynamic workplaces, intuitive competence fosters creativity, planning, and communication. It is the engine behind adaptive change and an ongoing educational process generating innovation. Intuition powers the discovery of new paths and products, connecting existing knowledge to future insights [18].

Conclusion

Intuitive thoughts can arise in both formal and informal settings; however, during the initial years, intuitive thinking is predominantly associated with informal understanding. According to this viewpoint, before receiving formal education, young children should be able to evaluate odds and unpredictability and, as a result, make probability judgements to a particular level. By contemplating intuitions either as a supplement to formal understanding or subjective, holistic cognitions, as obvious, a proficient educational way to probabilities should consider the young children’s existing probabilistic competencies. It is important to highlight that developing intuition can be practically

incorporated into a holistic version of education through attention to emotional states, conscious awareness, and physical engagement. Education should concentrate on creating a generic climate that encourages intuition. Whether the goal is to cultivate internal receptivity or to create an environment that recognises intuition as valid and valuable, educating for intuition requires an attitudinal shift, including receptivity to the imagination and the unconscious. An educational programme should inculcate the skills for critically interpreting intuitive experience. The consequences of educating for intuition go beyond enhanced intuitive function. Doing this work is not only supportive of the intuitive function– it will also support holistic well-being, psychological well-being, and creative processes more precisely.

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Author Contributions

Vykuntaraju K Gowda (VG): Conception and design, literature search, data extraction of the relevant studies, analysis of the data, critically revising the article, and final approval of the version to be submitted.

C P Ravi Kumar (RK): Manuscript review and final approval of the version to be submitted.

Renu Goyal (RG): Manuscript editing, review, and final approval of the version to be submitted.

Shrradha Sidhwani (SG): Manuscript review and final approval of the version to be submitted.

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