GLOBAL JOURNAL
OF HUMAN SOCIAL SCIENCES - G: LINGUISTICS & EDUCATION

Volume 26 | 2026 Article ID: GJHSS-258717 Language: English

Education that can't be Automated

Online First

Joyce E. Bellous§*

*Corresponding Author

§ Taylor Seminary, Edmonton, Canada (**OA**)

RECEIVED	ACCEPTED	ONLINE PUBLISHED	PEER REVIEW
2026-06-18	2026-06-26	2026-07-23	Double Blind

Abstract

Human beings have always made tools. There's a natural world we inherit just by being alive, and an artificial world we make. We get the word art from artificial. As makers, we form tools from natural materials available to us and these worlds (natural and artificial) act back on us to shape the human world. We're born human but becoming fully human isn't automatic. It's work. We're the most cognitively flexible of all species and cope with the widest variety of environments. We survive by changing behaviour to fit the situation in which we find ourselves. A concern in this essay is with education that's based on essential human experiences that Artificial Intelligence (AI) can't replicate because of how it's made. This essay isn't anti-AI. Its purpose is to describe a framework of essential learning children require for their humanity to flourish. Like all tools over time, we must situate AI wisely into this essential framework. That wisdom accumulates in learning environments in which children have what they need emotionally, cognitively, imaginatively, and relationally. With a framework woven from strands of four types of literacy (emotional, cognitive, imaginative, and relational) children can also weave AI's capacities into their learning as they're rooted and grow into their well situated, personal, relational knowledge.

Cognitional process | relational literacy | Lonergan | emotion | imagination

AI USE STATEMENT
No generative AI was used for analysis or results.

FUNDING
No external funding was declared for this work.

CONFLICT OF INTEREST
The authors declare no conflict of interest.

DATA AVAILABILITY
Not applicable for this article.

ETHICS
No ethics committee approval was required for this article type.

CONSENT
Not applicable for this article.

TRIAL REG.
Not applicable.

Crossref DOI: 10.34257/GJHSSG258717

How to Cite: Bellous (2026). Education that can't be Automated. Global Journal of Human-Social Science, Ahead of Print, 1-15. DOI: 10.34257/GJHSSG258717

AR Experience Web Page DOI

Print ISSN 0975-587X

Online ISSN 2249-460X

Under the strict compliance and defined process of

METADATA CONTINUATION

AUTHOR CONTACT QR LEDGER

Joyce E. Bellous§*

ARCHIVAL RECORD

GJHSS · Vol 26 · 2026

Article ID GJHSS-258717 · DOI 10.34257/GJHSSG258717

Print ISSN 0975-587X · Online ISSN 2249-460X

Global Journal of Human-Social Science - Section G
GJHSS

Education that can't be Automated

Joyce E. Bellous[§*]

Affiliations
§ Taylor Seminary, Edmonton, Canada (OA)

Abstract

Human beings have always made tools. There's a natural world we inherit just by being alive, and an artificial world we make. We get the word art from artificial. As makers, we form tools from natural materials available to us and these worlds (natural and artificial) act back on us to shape the human world. We're born human but becoming fully human isn't automatic. It's work. We're the most cognitively flexible of all species and cope with the widest variety of environments. We survive by changing behaviour to fit the situation in which we find ourselves. A concern in this essay is with education that's based on essential human experiences that Artificial Intelligence (AI) can't replicate because of how it's made. This essay isn't anti-AI. Its purpose is to describe a framework of essential learning children require for their humanity to flourish. Like all tools over time, we must situate AI wisely into this essential framework. That wisdom accumulates in learning environments in which children have what they need emotionally, cognitively, imaginatively, and relationally. With a framework woven from strands of four types of literacy (emotional, cognitive, imaginative, and relational) children can also weave AI's capacities into their learning as they're rooted and grow into their well situated, personal, relational knowledge.

Keywords: *Cognitional process, relational literacy, Lonergan, emotion, imagination*

*** Corresponding Author**
Joyce E. Bellous

DOI
10.34257/GJHSSG258717

1. Introduction

Human beings have always made tools. There's a natural world we inherit just by being alive, and an artificial world we make. The word art comes from the word artificial. As makers, we form tools from natural materials available to us and these worlds (natural and artificial) act back on us to shape the human world. While we're born human, becoming fully human isn't automatic. It's work. We're the most cognitively flexible of all species and cope with the widest variety of environments. We survive by changing our behaviour to fit the situation we find ourselves in (Gopnik et al, 154-155).

This essay is about human learning which, at this point, Artificial Intelligence (AI) can't replicate. The essay isn't anti-AI. Its purpose is to establish a framework of essential learning human beings depend on so their humanity can flourish. We must situate AI wisely into that framework. Our wisdom accumulates in environments in which children get what they need emotionally, cognitively, imaginatively, and relationally. With a framework woven from the four literacies (emotional, cognitive, imaginative, and relational) children can weave AI's capacities into their learning as they're rooted and grow into their own well situated, personal, relational knowledge.

When children come to school, they've already learned a lot. The four literacies in this essay identify the extent of their learning in the early years (zero to five) to say that learning and teaching at school must use what children already know and know how to do to augment their education. If children are well situated in their own learning capabilities, they're better prepared to see differences between what they have access to as knowers, and the role AI might play in extending their knowledge in novel ways.

This essay doesn't probe the potential of AI. It describes how children learn in the early years as 'knowers' with emotional, cognitive, imaginative, and relational knowledge that schooling can augment in ways that expand the scope of their early years' experience. At school, learning and teaching must build a humane foundation for children who hope to flourish—given the ubiquitous presence of digital culture.

1.1. What is Knowledge?

Given a pervasive digital culture, classrooms (kindergarten to doctoral studies) are no longer the main source of information—a massive technological shift that isn't going away. Information is automated. What does its presence imply for learning? In response to the question, we must first ask what learners already know (that wasn't automated) so we can realize what they need to continue learning that can't be automated. This inquiry rests on our need to understand knowledge itself.

We demonstrate knowledge when we recognize, perceive, comprehend, understand, or use it. In this essay, we look at early years' research to see how children learn about the world. Implications for an education that isn't automated are based on the capabilities they use as they acquire that knowledge. Being familiar with their learning capabilities helps us teach them later. This isn't an argument to exclude digital culture from education. We must see how children can connect early years' learning capabilities with learning at school. Automated information must find a viable place in a secure personal, relational foundation (that can act as an internal compass) based on early learning capabilities. We

don't teach these learning capabilities. The human brain provides neurotypical children with them at birth. Children are born as knowers.

As knowers, someone might say, I recognize him by the way he walks. I see your face is downcast. I get that you want a cookie, but you haven't eaten any supper. I understand you're sad because your gerbil died. If we claim to know something, we can demonstrate the claim with accuracy and truthfulness. If someone says, I know my times tables, they can recite them correctly. A range of knowledge claims can include statements such as: I know that, I know what, I know when, I know why, I know how, I know where. In all these claims, knowledge can be demonstrated. Claims and demonstrations signal knowledge is personal: I'm a knower. I can demonstrate what I claim to know.

Canadian philosopher and theologian Bernard Lonergan points out in *Insight* that there are two types of knowing. There's the relation of objects (people and things) *to us*, and there's the relation of objects *to each other*. Cognition has its origin in what he calls the pure drive to know (Tekippe, 42). Lonergan names the fundamental parts of the cognitional process as the actions of sensing, imagining, questioning, understanding, conceptualizing, reflective questioning, weighing the evidence, and judging. When we consider his list, it contains a significant omission. He doesn't mention emotion. To be fair, he may have under-analyzed it or taken it for granted. Emotion had a bad reputation in his day. Maybe it still does. But emotions are central to knowledge that can't be automated.

Lonergan's view is that the cognitional process must remain open to revision, but German scientist and philosopher Karl Popper mentions the role of conviction - beliefs we no longer hold open to continuous testing and revision because we've chosen to live by them. Convictions are positions we can be counted on to take, e.g., consistent responses to injustice. In the last century, if thinking was scientific, theories (inferences) must remain open to revision. Much of the scientific inquiry early in the twentieth century was based on induction, a slow gathering of singular statements (observations, experimental outcomes), until a more general theory (sometimes called a universal statement) could be established and verified because no more instances appeared to disprove or contradict the theory in question (Popper, 3-7).

Austrian-British philosopher Karl Popper (1902-1994) criticized the view that science could thrive on induction alone. His position influenced American historian and philosopher Thomas Kuhn's transformative perspective on science in *The Structure of Scientific Revolutions*. Popper and American philosopher C.S. Peirce held to different ways of combining induction and deduction. Deduction begins with a general theory we rely on as we see where and when it explains data. In combining induction and deduction, Peirce added receptivity. He used deduction, induction, and receptivity in his abductive method of inquiry (Bellous, 2025, 207-253). If children are scientists in the crib (Gopnik et al), they're also philosophers from the start. They investigate the world in ways that echo Lonergan's, Popper's, and Peirce's methods of inquiry. They use a process of discovery by relying on learning capabilities they have from birth onward. Their approach to discovering the world is inductive, deductive, and we can often see in their faces the intensity reminiscent of Peirce's receptivity.

In addition to these descriptions of how we gain knowledge, Aristotle saw that human beings are makers, doers, and knowers. As makers, we produce all sorts of things: shoes, ships, music, computers, tools. The natural world comes about through processes we can't control. As artisans, we make an artificial world. To Aristotle, what motivates makers is beauty and excellence. As doers, we're moral beings who realize we can do right or wrong. Doing what's right makes us happy as we associate with others, and care about their welfare, as well our own. As knowers, human beings are learners. We seek knowledge. We may study it for its own sake, but as we make, do, and know, we're always thinking.

To Aristotle, makers engage in productive thinking, doers engage in practical thinking, and knowers engage in speculative or theoretical thinking. The universal value that motivates making is beauty. The universal value that motivates doing is personal and social goodness. The universal value motivating knowing is truth (Adler 16-19). Beauty, goodness, and truth are values that direct the pure drive to know. Values we take on as we make, do, and know are influenced by the part emotion plays in all thinking. The pursuit of beauty, goodness, and truth are values we can choose that shape our character.

Knowing moves us toward seeing more clearly. American philosopher Mortimer Adler observed that philosophical thinking helps us understand things we already know, and understand them better than we now know them, which is why he thought everyone should learn to think philosophically (Adler, ix). Philosophy helps us attend to what we're thinking (productively, practically, theoretically) as we make, do, and know and urges us to keep values and beliefs in tune with our convictions—what we say is important to us.

1.2. Where is Knowledge Now?

Two shifts happened in the last century, among many other events, that concern our ideas about knowledge and power. French philosopher Michel Foucault made his greatest impact on how we understand power. He said power doesn't only reside in positions, places, or people - it's exercised in every social relation. Power is like energy people use every time they interact, so there's subtle, not so subtle, change. Someone's up. Someone's down. Equal footing is established or re-established. It wasn't his focus, but as Foucault disturbed our ideas about power another insight came into view. If power is energy, circulating through every social relation, we could learn to empower each other. We could learn to liberate others rather than stymie them. Foucault's insights about power led to an empowerment movement in the last century (Bellous 2016).

The other shift concerns knowledge. Like Foucault, management guru Peter Drucker announced a shift in our experience of knowledge. Like power, knowledge used to reside in places, positions, and people but Drucker saw information as a form of energy the energy for what he calls mind work (Drucker, 27). Drucker uses an analogy to help explain a shift that still surrounds us. He began by saying there's more to information and data processing than the computer, which emerged in the 1940s. There's an information industry. To make the distinction, Drucker referred to the emergence of electricity and the electrical industry. Electricity, which has always been part of the world, was investigated in the 1700s, e.g., by Benjamin Franklin, in his experiments with lightning (Kuhn 14ff). The electrical industry, however, was initiated when Ernst Werner Siemens invented the first practical generator in 1865, but it only came into effect when Thomas Edison invented the electrical lightbulb (1878-1880). Between Siemens and Edison, many highly talented inventors were at work, but the electrical light bulb made it possible to use electricity as a universal form of energy (Drucker, 24-25). We're in the middle of digital culture and an information shift. Is AI

electricity, Siemens' generator, or the electrical light bulb for the information industry?

I want to raise a question I can't answer. What's the problem AI presents today and the foreseeable future? Can we state the problem clearly and examine it's impacts critically (Popper, xix). There's a lust for AI. There's hysteria over AI. There's fear. Many parents and teachers worry that AI makes learners lazy. Will AI replace thinking? Digital culture feels like a snowstorm. We wonder if we'll be caught in a blizzard and lose our way. This storm isn't helping us answer the initial question: what's the problem AI clearly presents? It's too soon to answer the question critically but this essay focuses on learning and teaching that can help children situate themselves in their own thinking and remain confident as knowers who can demonstrate knowledge and enjoy learning. But conditions at school must change for learners to catch a love for learning and strengthen their drive to know. They need personal, relational knowledge that can situate AI in their learning experience.

Knowledge keeps accumulating. To understand its growth, we may think work is more complex because more knowledge is needed. That's not what happened. Work got more complicated as knowledge workers lived longer. Working lifespans increased greatly in the last century (Drucker, 278). Knowledge work doesn't lead to the disappearance of work or the elimination of skill (Drucker, 267). It increases the need for more knowledge. From an economy of goods, we moved to a knowledge economy (Drucker, 263), from agricultural production we shifted to knowledge production.

Why did the change come about? Drucker saw that knowledge workers replaced manual workers, skilled and unskilled (Drucker, 276). From the beginning, computers link manual and mental labour: we learn to use computers by working with our minds and hands. Due to the shift, we often neglect the importance of other forms of manual work at school. But we still need plumbers, and they need to think well. For a long time, schooling divided learners into mental and manual laborers, giving manual work a lower status. This divide fails to appreciate Aristotle's depiction of human activity. All human activity requires us to think well.

As he described the knowledge shift, Drucker raised the problem of education and said we must first create a conceptual understanding of information (Drucker, 25) along with a new understanding of learning and teaching (Drucker, 26). He observed a trend in the 1960s we still worry about: learning and teaching are more deeply affected by the information industry than any other area of human life (Drucker, 26). Therefore, we need new approaches, new methods, and new tools for learning and teaching. In an information industry, the primary educational need is to increase the productivity of learning. Teachers must be more effective in helping make ordinary people capable of superior performance (Drucker, 26). If we fail to create relationally satisfying learning environments at school, that goal is difficult, if not impossible, to accomplish.

In working towards the productivity of learning, classroom cultures must focus on four types of literacy, beginning with emotional literacy. The other three are cognitive, imaginative, and relational literacies. These literacies rely on brain-based capabilities every neurotypical child has at birth. If these literacies flourish, newer approaches to learning and teaching augment children's learning capabilities so they can be capable of superior performance to their great personal satisfaction.

The drive toward productivity isn't directed toward making learners slaves to an information industry. In relationally healthy classrooms, every child matters. Learning is inherently satisfying. In terms of education, as they leave school, every graduate should enjoy a significant measure of self-understanding, know what interests them, what they're good at, what they want to make (whether science experiments, poetry, or wooden tables), and feel hopeful about what they can do next. As French philosopher Simone Weil put it, children need to be so well rooted in an environment, the equality of possibility must be so widely accessible, that every child is equal in hope to every other child (Weil, 14).

To make hope part of their self-identity, schools must encourage a love of learning. If we fully understand how emotion affects our freedom to flourish, for this graduation goal to be real, classrooms must be pleasant and challenging for everyone. A caring environment doesn't minimize intellectual growth, it makes it possible. Caring environments don't privilege individual self-esteem, as happened during the self-esteem mistake in the last century. Children don't need to get high on themselves. They need self-efficacy, which is about knowing what to do if something goes wrong. It's a feeling of belonging, it's about feeling strong, competent, (Clinton, 99) and confident because children know they're good at making, doing, and knowing. Caring environments support emotional literacy which is how humanity flourishes. Emotional literacy has at its core a felt sense of connection the young can depend on to help their humanity flourish.

1.3. The Human Mind that Knows

As we think about knowing, we must ask how we think thought works. Explanations of thought depend on metaphors we use to describe the mind. There are two metaphors that shaped how we believe minds work: firstly, the mind is a mirror that looks out at reality - what's already out there now (Lonergan, 385) and reflects what it sees; secondly, thought is introspection, i.e., it's looking within. Both metaphors rest on an activity of looking. When Canadian psychologist Donald O. Hebb introduced his scientific investigations of the brain (1949), he shifted his focus from mind to brain. He realized it's brain that thinks.

The mind has a capacity for thought, consciousness is a variable state and is the present activity of thought in some form but thought itself is an activity of the brain (Hebb 1980, 3). Human beings are a thought-dominated species (Hebb, 1980, viii). Thought is an outcome of complex communications among networks of neural cell-assemblies. One set of cell assemblies links its neurons to the external world, another set links neurons to each other internally. I will say more about how brains work, but let's focus on metaphors we use to describe thinking. Lonergan shifted from metaphors for looking to propose that the mind, more accurately, the brain is a factory. A factory metaphor contextualizes Hebb's discoveries about the brain, but I know of no connection between the two theorists, and Lonergan uses the word mind exclusively.

In his analysis of insight, an outcome of the cognitional process, Lonergan described the mind, not as a mirror that reflects reality, nor as introspection. It's a factory in which materials supplied by outer and inner sensory data are processed into appropriate syntheses. The brain factory isn't a simple assembly line. It isn't a factory with a set of fixed processes. It's a universal machine complex erecting all kinds of factories, adjusting, and improving them. Eventually it may scrap parts of what's currently active and replace them with radically new designs. What keeps thought moving forward is the role insight plays in allowing new thoughts to shape thinking (Lonergan, 405-408). Lonergan is consistent

with Hegel's view of how thinking works (Bellous, 2023), but increases the complexity of what mind/brains can do.

Hebb and Lonergan reveal this complexity because humans are the most intelligent of all the animals, but also the most emotional (Hebb, 1980, 47). As affective neuroscience teaches us more about the brain, ideas about human emotion *must* change along with the complexity of the cognitional process. We *must* take account of emotion in human knowing.

1.4. Experiencing a Felt Sense of Connection: Foundations for Emotional Literacy

Learning is shaped by essential caregiving practices adults take on intentionally to help children flourish. Education that can't be automated rests on the same conviction. What can't be automated is character, civility, and relationality. These attributes require a secure felt sense of connection with people who care for us. A felt sense of connection builds a foundation that remains in place as the site for future learning. Character, civility, and relationality are learned in face-to-face, serve and return exchanges (like a tennis match). These exchanges rely on emotional connection as children feel loved by those who care for them (Clinton). Intellectual growth relies on emotional connection.

As they investigate intellectual growth, American researchers Stanley Greenspan and Stuart Shanker (G/S) assert that emotion is a child's first language. Emotion and cognition are part of the same basic process (G/S, 250). Cultural learning in infant/adult caregiver interactions is the centerpiece of all learning. Cultural learning relies on signs that convey presence and involvement. A sign is any mark, body movement, symbol, or token used to convey thought, information, and intention (Seboek).

Infants sign. They look at or point to objects to create meaningful connections between sign (eyes, finger) and an interesting object. From birth, signing is a survival strategy for all life forms. The body interacts with the brain to produce signs (messages, thoughts, cultural behaviour) (Seboek, xii-xvii). One-year-old babies know they'll see something interesting by looking where others point. They know what to do with an object by watching what others do with it. They know how they should feel about something by seeing how others feel about it (Gopnik et al, 34).

Children use, revise, and continue to enlarge a repertoire of signs to connect emotionally with adults. The most distinctive trait of human beings is the two separate, thoroughly commingled channels at our disposal: non-verbal and verbal signalling. This dual system allows infants to encode and decode messages they send and receive. Encoding (a neuro-biological transmutation from one form of energy to another via impulses from one neuron to another) and decoding (a reconversion of that energy) imply a set of unambiguous rules adults and infants use to send messages to one another (Seboek, 9). In simple terms, a sign is something that stands to somebody for something in some context that's conveyed somehow (Seboek, 11-24). This process is evident throughout childhood.

Emotional signalling during caregiver exchanges relies on the way the brain works. Emotional exchanges are the foundation for language, visual-spatial thinking, motor planning, motor sequencing, executive functioning, and other aspects of sensory processing (G/S, 251). The foundation for creative, logical, and reflective thinking are built through adaptive, emotion signalling exchanges.

Reflective thinking is linked to initial caregiver practices in which children read what they're feeling and read what caregivers are feeling. Jean Piaget's well-known analysis of intelligence doesn't account for its beginning point in emotion. Piaget thought of intelligence in terms of adaptation to the environment and asked about connections between thought and things (Piaget, 4). Greenspan and Shanker studied the serve and return exchanges infants have with caregivers (G/S, 288) and focused on emotional exchanges - connections between other objects and us. Greenspan and Shanker focused on relational exchanges. Piaget focused on individual achievement.

A child's consciousness develops as reciprocal, soothing, emotion signalling encompasses a wide range of feelings to allow children to separate emotion from action and provide freestanding symbols (images, ideas) that capture experience, which they use in reflective thinking and problem-solving. Even before they use hands and arms to gesture and communicate feelings, intentions, wants - infants have a face. Human beings have a complex facial musculature that enables us to express a wide range of subtly nuanced facial expressions, allowing us to participate in a wide range of emotional exchanges (Darwin). Growth happens because "it is only through emotional exchanges that words and images acquire meaning for a child" so that during development, emotional interactions enhance cognitive capacities and orchestrate their operation (G/S, 247-250).

Caregiving practices establish a felt sense of connection. Infants are created to connect. The discovery of mirror neurons in the 1990s provides a basis for the brain's ability to connect. Mirror neurons fire (send an electrical pulse to other neurons) as one person acts, and another person observes the action. Neurons mirror behaviour, as though the observer is also acting. Mirror neurons enable people to pick up emotional cues, states, and intentions sufficiently to attend to others and have the presence of mind to pause and wait to hear what's going on. Emotion is governed by identifiable brain circuits measured in laboratories. Emotion works with cognition in an integrated, seamless way to enable us to navigate relationships, work, and experience spiritual growth (Davidson, xiii-xiv).

In addition to mirror neurons, we have a many-branched Vagus Nerve Complex (VNC), the body's social-engagement system. When the VNC runs the show, we smile when someone smiles at us and nod our head if we agree with someone. The VNC is the longest of the body's 12 cranial nerves, extending from the brainstem to the abdomen. It links many organs (heart, esophagus, lungs). The VNC promotes communication between the brain and body and is engaged as we convey the meaning of an event. For our physiology to calm down, heal, and grow we need a visceral feeling of safety. If we're safe, the VNC is engaged and sends signals to the heart and lungs, slowing the heart rate and increasing the depth of our breathing. We feel calm, relaxed, centred, or pleasurably aroused. The VNC registers gut-wrenching sensations that create big feelings. The VNC makes a felt sense of connection possible. As Daniel Goleman asserts in *Social Intelligence*, emotion is contagious.

As experience gathers, children link cognition and emotion to integrate processing areas of the brain (G/S, 251). As emotion matures through soothing, pleasurable, reciprocal exchanges, a child's reactions are tamed by co-regulated, soothing, adult/child interactions, even if they're experiencing a big feeling, e.g., hunger, fear. A regulated, tamed emotion becomes a signal. Signals are very different from big feelings. Signals generate social interaction so that infants can telegraph hunger or thirst to convey their needs and desires. Signals create a continuous flow of emotional exchanges if caregivers notice, recognize, and respond to them. Signal exchanges modulate and regulate emotions, behaviour, and

mood to initiate a felt sense of self to help toddlers experience 'me' and 'not me' during these exchanges. Constructing a symbol (idea, image) to represent an emotion enables infants to know they're hungry or scared.

As a child's first language, emotion is neither interruptive nor disruptive to thought. It facilitates thought. A *feeling* permeates everything we do. Brain circuits that control and regulate emotion overlap with those involved in functions we think of as purely cognitive. There's no clear, distinct line between emotion and other mental processes. They blur into each other. Virtually all brain regions play a role in or are influenced by emotion, e.g., visual and auditory cortices. The neural organization of emotion has important implications for understanding why thinking is altered as we experience emotion. We can learn to use our cognitive capabilities to intentionally regulate and transform emotion (Davidson, 89-90). Experience, intention, and thinking itself (and by itself), especially new thoughts, can shift emotion. Mental activity alone can change our brains (Davidson, 11), as Lonergan's factory metaphor intimates.

As symbols emerge to signal an emotion, children can figure out *the why* of it. The ability to know an emotion—*to study one's own perception of it* is proportional to the degree to which it can be tamed and transformed into interactional, representational signals (G/S, 252). Once emotions aren't simply experienced and expressed, they become meaningfully available in interactive, emotional patterns children use to communicate needs and intentions to adults who sensitively read and co-regulate with them. As signals become mental representations (e.g., ideas), children compile their developing concepts to inform their worldview.

The brain's ability to form patterns also moves thought forward as we sense the reality of self and others. Although infant brains *can* perceive patterns, babies must *want* to look and listen. They're enticed by the emotional rhythm of an attentive voice, a big smile, gleaming eyes, interesting sights, and sounds. A rhythmic pattern of vocalisation and movement enables infants to connect with the world. Eventually, patterns are built into a foundation based on a child's making-meaning, emotional activity. During mental growth, levels of engagement support an emerging sense of self as a participant in that growth.

Emotional capabilities develop through caregiving practices to help children learn to connect with and comprehend the world. They learn new cognitive skills from emotional experiences (G/S, 51). To grasp concepts such as justice or love, to understand motives of a character in a novel, children need an internal compass on which to base comparisons, suggest contrasts, to offer insight, and to make judgments (G/S, 52). Slow growth in emotional signalling creates complexity that shapes the meaningful world a child inhabits.

Given the experience of using emotion-based learning capabilities from birth, emotional literacy's ongoing development focuses on asking reflective questions such as the following: What am I feeling? Do others feel what I'm feeling? What are you feeling? How are my feelings influencing what I'm doing? How do my feelings influence what's going on between us? What's going on within you? What do I need from you? What do you need from me? In healthy learning environments, children use emotional skills to ask these questions of self and others.

1.5. Implications for learning and teaching

American psychologist Abraham Maslow built his growth psychology on the strength of his research into human potential. He addressed children's learning as part of that model. He proposed that growth takes place during activities in which a child's next step forward is subjectively more delightful, more joyous, more intrinsically satisfying than the last. The new experience validates *itself* rather than being motivated by external influences. The process of healthy growth moves through a never-ending series of free choices children make as they're drawn toward growth and away from the need to put safety first. Growth continues as they choose between remaining dependent or becoming independent, and as they reach toward maturity rather than immaturity (Maslow, 43-45).

Maslow identifies distractions that get in the way of a child's growth. These distractions include ungratified essential needs, the attractiveness of safety and security, defensiveness against pain, fear, loss, threat, and the ever-present need for courage. He also observes that children have the potential to help or to harm others and healthy growth is an outcome of making good choices to help rather than harm. Growth needs include the following:

- Healthy, spontaneous children respond to their own sense of self and reach out to the environment in wonder and interest. They express skills at their disposal if they aren't crippled by fear and feel safe enough to dare.
- But when they're experiencing the delight of reaching forward, they need help from other people.
- Children must be safe and self-accepting enough to prefer the delights of discovery, rather than being frightened by them.
- If they choose these experiences, they return to them, repeat them, savor them to a point of satiation and boredom.
- When children feel bored, they show a tendency to move on to more complex, richer experiences and accomplishments if they feel safe enough to dare.
- Moving forward, reaching out, has a feedback effect. They feel certain about the activities they like and the activities they don't like and are gaining a sense of mastery, self-trust, and self-confidence.
- Safety continues to matter. If safety is absent, delight isn't strong enough to move children forward. They withdraw from unsafe situations. Growth choices are made by children who are safety-need gratified. Only they can afford to be bold.
- As their growth moves forward, children need to experience both delight and boredom, as criteria for choices they make. If choices are made because someone else wants the child to choose in a particular way, the child's sense of self is lost. If they feel they must preserve the safety of adult approval and continuing support, if adult approval is threatened, they tend to give up self-trust and their own delight-criteria because they fear they'll lose adult protection.
- If the choice is really a free one, and they aren't crippled by fear, children ordinarily will choose to move ahead.

Growth is chosen if the emotional tone of a learning environment presents the following features of relational security:

- Gratification of children's needs for safety, belongingness, love, and respect, self-confidence so they can feel unthreatened, autonomous, interested, spontaneous and can dare to choose the unknown and explore the environment.

- These experiences help make growth choices attractive and less dangerous, and regressive choices less attractive and more costly (Maslow 55).

Parents and teachers can demonstrate that growth choices are more attractive, regressive choices are less attractive and more costly, but choices must belong to each child.

The adult work implied in Maslow's research sets a relational tone. Careful readers realize safety is a complex dynamic. We look for enough safety to allow children to try new activities, but we don't coddle children. If we're over-protective, they have no inspiration to move forward. This adult work encourages the growth of character, civility, and kindness.

Children must be free to use what they know to continue learning. In healthy learning environments children's interests hold a central place. To experience a felt sense of connection, Maslow knew children must feel safe enough. Weil knew they must feel rooted and hopeful. With the right tone in an environment, emotional literacy is achieved relationally, it's not something children can learn on their own.

1.6. Situating children in their own Thinking: Foundations of Cognitive Literacy

Everything about the mind is the result of what happens in the brain, from the most automatic mechanisms that govern breathing to refined, culturally elaborated details of social responsibility. This is how brains work. With human beings, nurture is our nature, and culture is part of our biology.

Babies are learners. In the early years, they think, observe, and reason. From the moment infants see others, they see them *as* people. Observing others is part of being a person (Gopnik et al, 7-24). Children use their cognitive learning capabilities in the early years to solve three problems: problem of other minds, of the external world, and of language. Each problem has philosophical, psychological, neuroscientific, and cultural dimensions. The next section summarizes the foundations of cognitive literacy by showing how children solve these three problems.

1.6.1. The Other Minds Problem

A typical brain has about one billion cell assemblies. As infants experience the world, a stream of sensations enters the brain to activate nerve cells. Nerve cells (neurons) converse with one another. They send electrical impulses to one another until one nerve cell excites another and transmits a message. These messages move from neuron to neuron among networks of nerve cell assemblies (Hebb 1980) to form a communication system in the human body. As sensations enter the brain, they excite one set of nerve cells linked to the external world through organs (e.g., eyes, ears) and to various parts of the body, e.g., as bones or muscles change position (Klein 1987). The process creates percepts that inform experience and establish memories that continually provide children with data (Hebb 1980) that accumulate as they learn about the world.

A second set of nerve cell assemblies is linked to each other, not to the external world. The second set is responsible for conceptual learning. Perceptual learning creates percepts, conceptual learning forms concepts. Concepts don't erase percepts. We have access to both. This brain activity makes learning possible, including a child's capacities for abstraction, generalization, and pattern recognition (Hebb 1980). Perceptual and conceptual learning work together in this communicative system (Hebb 1980). As far as thought is concerned, developing new concepts is a process of modifying old ones (Hebb 1980) based on new learning, i.e., the factory metaphor. Growth includes learning, unlearning, and relearning. Children learn, unlearn, and relearn in their early years.

Canadian psychologist Donald Hebb (1904-1985) proposed that an infant's first idea of a person comes from observing others. Infants can't see their own body. Even if toddlers stand in front of a mirror, they can't see their own body as a whole entity. They lack perspective. Instead of knowing themselves first and inferring that others are similar, they reverse that order. The first idea of a person is based on their capability for taking in what they see in others and applying these elements to themselves (Hebb, 24). As children learn what other minds are like, they learn what their own minds are like.

At birth, babies discriminate and prefer human faces and voices to other sights and sounds. Before they walk, talk, or crawl, they see differences in expressions of happiness, sadness, and anger. They recognize that a happy-looking face goes with the chirp of a happy tone of voice. They know how human beings move. Babies seem designed to see people who love them more clearly than anything else (Gopnik et al, 28-29). In the first month, babies can imitate facial expressions (Gopnik et al, 30). A capability for imitation is deeply significant. Babies have no mirrors in the womb. They've never seen their own face. To imitate, they must have an internal feeling of their own body. Newborns not only distinguish and prefer faces they seem to recognize that faces are like their own face, and recognize others are 'like me'. Babies gesture in rhythm with intonation patterns in mom's and dad's voice, and coordinate their expressions, gestures, and voices with the gestures, expressions, and voices of others (Gopnik et al, 31).

Like imitating, pointing is so familiar we may fail to see it as a signalling strategy. To point to something, especially if you point again and again, looking at another person's face until he or she looks at the object with you, implies that you think, at some level, the other person should look at what you're looking at. By one year, babies look precisely at the place where an adult is looking and have a radically new understanding of other minds. When shown a new, maybe dangerous toy, one-year-olds modify their reactions according to the expression on mom's face. If mom smiles, they crawl toward the toy. If mom frowns, they stop dead in their tracks (Gopnik et al, 32-33).

When babies are one year old, they seem to discover that emotional rapport extends to joint attitudes about the world. As this learning takes place, expectations develop. A one-year-old can point to a toy that's out of reach and expect dad to get it for her. A baby's new interests lead to deeper commonality and communication with others (Gopnik et al, 34). As babies learn people have the same attitudes to objects that they do, they learn something else. Sometimes others don't share the same attitude, e.g., touching precious objects. The terrible twos stage reflects a genuine clash between children's need to understand others and their need to live happily with them. At around two years of age, children begin to show genuine empathy. Genuine empathy means you know how others feel and how to make them feel better, even if you aren't feeling the same. Babies are born with roots of empathy. By two they begin to rely on those roots (Gopnik et al, 35-43).

Children learn about other minds by developing '*internalized working models*' that become patterns for seeing how people relate to each other. Rather than being fixed, these models are flexible. Like scientific theories, they change with new evidence. Children show this flexibility as they try to tease someone or realize someone's teasing them (Gopnik et al, 49-51).

In their early years, children don't remember how their thinking has changed. At three, they seem not to see the difference between past and present thoughts, although they understand the difference between past and present events. They don't seem to recollect past thoughts if they conflict with current thoughts. By the time they're five, they begin to understand thoughts, beliefs, perceptions, emotions, desires, and feelings. This learning is an outcome of their experience with other minds (Gopnik et al, 51).

1.6.2. The External World Problem

The human brain translates sensory data into mental representations. In the early years, a child's brain ends up with a picture that's closer to the real structure of the world (what's already out there now) than raw sensory data might suggest. Consider the question of how babies divide up the continuous visual stream of information entering the brain and break it into the reality of separate objects. It turns out that babies show interest in complex patterns with high contrast and turn away from simple patterns that have little contrast (Gopnik et al, 62-64).

Babies have principles they use to impose order on a chaotic visual world (Gopnik et al, 65-66). Images with stripes offer a sharp contrast between brightness and texture to indicate where objects begin and end. Babies trace the outside edges of objects. Paying attention to edges is the best way to divide a static picture into separate objects. It's how we can tell a painting on the wall is crooked when we enter a room. Children also see that objects move. Movement provides better clues about where objects begin and end than looking at edges alone. Babies learn about *the principle of common fate*: things that move together on the same path are part of the same object. Seeing parts move together, a common fate, seems to tell babies it's just one object and that the parts are joined.

Babies learn through observation and testing that objects have edges, move, and are three-dimensional. Even tiny babies act in ways to indicate they perceive distance. Young babies have what's called *size constancy*. Even though they have flat images on the retina, they guess a ball is the same ball even at a greater distance. Babies go beyond the image on the retina and perceive something about the real ball out there. As they look at a silent video of people making *ooo* or *eee* sounds, five-month-old babies can tell which face went with which of the two sounds. They have a primitive ability to lip-read, at least for simple words (Gopnik et al, 68-70).

In the first months of life, babies solve several philosophical conundrums. They know how to use edges and movement to separate objects. They know something about how objects move. They know objects are part of three-dimensional space. They connect information that comes from different senses, such as a ball's exuberant bounce and its accompanying *boing*. They predict where an object will reappear if it vanishes from sight. Realising that an object they can't see still exists is the most important, difficult intellectual challenge infants face (Gopnik et al, 70-73).

Babies seem to understand *causality*. There are two kinds of causal processes: physical causality - hitting a balloon and seeing it move, and psychological causality - smiling and cooing and getting mom to look at me. We influence people psychologically by communicating, talking, gesturing, and making faces. Signalling helps children learn about causality. At one year, they seem to have learned something about distinguishing between physical and psychological causalities. A greater understanding of physical causality allows them to plan, scheme, and use objects as tools. By eighteen months, they understand how objects influence each other. Babies start out knowing something about invisible objects and learn much more. They start out knowing something about how events make other events happen and learn much more. They make assumptions about how to influence the world and learn complex ways in which things interact (Gopnik et al, 75-79).

In the first three years, *categorisation* is an important problem to solve. Recall that they learn an object that traces a particular path is the same object. At eighteen months, they can separate objects into categories. By two or three years, they have a deeper understanding of what it means for an object to belong to a category. Two-year-old toddlers look beyond superficial features of an object to determine deeper laws that govern what it will do. At three or four, children look under the surface of things to recognise that objects with the same insides are the same kind of thing, but objects with similar outside surfaces and different insides aren't the same kind of thing (Gopnik et al, 81-83).

Babies express *an explanatory drive,* which Lonergan called the pure drive to know. In the first three years of life, if there's a puzzle, a mystery, a hint of a pattern that doesn't make sense, children are consumed by the desire to explore and experiment. At around eighteen months, if you show a child an object with an unexpected property, like a can that makes a mooing sound, they test it to see if it will do other unexpected things. Playing around with the world contributes to solving the big, deep problems of *disappearance, causality, and categorisation* (Gopnik et al, 85-86). A child's exploratory drive comes with emotion, a deeply disturbing dissatisfaction if they can't make sense of something and a distinctive joy if they can. We see these emotions on their faces. Babies depend on others for much of their information, but dependence makes them more in tune with the real world, not less. It gives them better information than they could gather on their own.

1.6.3. The Language Problem

If visual data must be divided into separate objects to learn about the external world, children must divide up the flow of sounds entering their senses to hear words and infer meaning. By three years they solve this problem. Sounds have become words. Words are layered with meaning. Their capability for *code breaking* links words to sounds. Code breaking is complex. Knowing a language involves acquiring a set of unconscious rules that aren't like the rules of grammar taught at school. Rules for decoding are natural, informal rules, like ones we use to turn sensory data into mental representations. No one instructs children in how to decode.

If the idea of unconsciously learned rules is odd, think of spelling games you play on your phone as you guess a hidden word. As you guess at hidden words, you rely on rules no one taught you. These rules direct the choices you make as you play the game. As Gopnik, et al point out, human beings

> "are designed to take in sequences of sounds and translate them into representations of meanings just as we are designed to take in sensory information and translate it into representations of objects and take in facial expressions and translate them into representations of feelings. We have an implicit set of rules that allows us to transform sequences of sounds we hear into sequences of ideas (Gopnik et al, 99).

By kindergarten, children have mastered the problems of translating sounds to words and meaning and have mastered complexities of an at-home language (Gopnik et al, 97-100).

Learning language has unique issues. With the first two problems, external world and other minds, there's a world of objects and people children rely on to gather and apply theories they develop. Language problems aren't about discovering an independent reality. In learning language, we coordinate what we do with what others do. As children learn a language, they figure out what people they live with do and learn to do it themselves. Learning language is a sociological, anthropological problem in which others are crucial. In four to five years, children learn the language spoken in their community. Adults are both teacher and subject matter. What they say equals what the language is (Gopnik et al, 102).

Newborn babies already go well beyond the actual physical sounds they hear and divide them into more abstract categories. The process is remarkable. In the first tests of American infants listening to English, babies one month old discriminated every English sound contrast they heard. They distinguished sounds for 'r' from the sound of 'l'. Their behaviour demonstrates a *categorical perception phenomenon*. They thought all the letter *r's* were the same and were different from all of the letters '*l*.' They discriminate sounds not only of their own language but of every language, including languages they'd never heard.

They make distinctions used in all the world's languages during the first six months of life. This skill fades as they hear their own language repeatedly. With brain-based skills, the principle is 'use it or lose it'. By twelve months, they no longer distinguish sounds of languages they're not hearing. As they hear us talk, babies group sounds into categories their own language uses. By one year, babies' speech categories begin to resemble adult speech (Gopnik et al, 105-108).

After listening to many of the 'r' sounds in English, babies develop an abstract representation of r - a prototypical r - that's stored in memory. If they identify a new sound, they seem to compare it to prototypes stored in memory and pick one that fits best. Once they have prototypes in memory, they distort what they hear (if mom has a cold) to make it more like the prototype. In a similar way, if you show people a drawing of a house and ask them to draw a house, regardless of the model shown, they draw a house that's stored in their memory. Language prototypes eventually make it hard to distinguish the sounds of other languages, e.g., a Canadian 'r' from a Scottish 'r' sound.

When babies are around one year old, they move from sounds to words embedded in the stream of sounds they hear. Babies seem to learn some general rules about words in their own language before they learn words themselves. By nine months, they've learned English contains words with a certain stress pattern, a first-syllable stress pattern, like BASEball or POPcorn, a pattern more common than words like surPRISE. Other languages have different stress patterns.

After babies learn possible sounds in their language, they learn which combinations are possible (Gopnik et al, 109-110). By nine months babies show a preference for listening to sound combinations that are possible in their own language, even if they don't form real words. Lewis Carol understood this when he used gibberish in *Alice and Wonderland.* Once they know which words are possible, infants divide a continuous stream of speech sounds into words, even if they don't know what the words mean. They're learning about speech long before they talk (Gopnik et al, 111).

They already know something about how dialogue works. They begin babbling by using consonants: *dadadada*. Across all cultures, babies babble using consonant-vowel combinations. The first English words tend to be *gone* for disappearance or *uh-oh* when using tools. The theory is that when a baby uses the word *gone* the concept of disappearance seems to emerge as well (Gopnik et al, 126).

Babies discover that everything has a name. The discovery triggers a naming explosion. Just one salient instance with a word connected to an object and babies retain the new word by *fast mapping*, a learning capability used to link new words to new objects. They start to fast map about the same time they start the naming explosion. Experiments show children know something about other people's intentions and use that knowledge to figure out what words mean. It seems as if babies make the strongest word-object connections based on what mom and dad look at when a word is stated, rather than what they're looking at. They seem to know people talk about new things rather than familiar things (Gopnik et al, 116-117).

Putting words together to make new sentences with a complex meaning is another central part of language. Babies first go through a two-word stage: e.g., 'mummy gone' because they seem to understand that only certain word orders are possible. They use word order to convey different meanings: 'kiss Teddy' means mom should kiss Teddy. 'Teddy kiss' means Teddy will kiss mom. Two-word sentences follow rules. Sesame Street's Cookie Monster talks this way. It's easy to miss that his language is systematic. Children make up their own language with rules and grammar, just as they decide what words will mean. Their speech may sound fluent but it's a language parents don't know (Gopnik et al, 118).

Children must learn word order, verb and noun endings, and pluralising. If we look at their mistakes, we see they learn in an intelligent way. When children learn to read and write, they translate sounds into the system of written letters (Gopnik et al, 119-121). They have learning capabilities to *abstract patterns* and *discover regularities*, which linguists call *bootstrapping* to signify that they take what they know and use it to learn more (Gopnik et al, 126-131).

Adults support language-learning by using *Motherese,* a language used in all cultures to comfort and engage infants. Motherese relies on well-formed, elongated consonants and vowels that give clear examples of speech sounds. Motherese offers babies the range and variety of sounds they need to abstract prototypes for their own language. With support, babies learn new words and shape the meaning they give to those words (Gopnik et al, 129-130).

During the early years, children learn that other people have minds, the world exists independently of subjective experience, and words have meaning. As they learn, they *form expectations and make predictions*. A baby's world isn't only concrete. They already see the soul beneath the skin. They hear the feeling behind the words (Gopnik et al, 133-146).

A child's learning capabilities strengthen over time to be more powerful and accurate. When a three-month-old, a one-year-old, and a four-year-old look at the same event, they have different thoughts about it (Gopnik et al, 149). Babies use representations and rules to make predictions about what the world is like. They compare experience with what they predict. If there are discrepancies, they modify their representations and rules. If they see new patterns, they create new representations and rules to capture them, which leads to new learning. Then predicting, creating, and testing start over again. A key aspect of development is that babies actively *look for patterns*. They test hypotheses and seek explanations. They figure out what's going on due to their *explanatory drive* (a pure drive to know*)*. This drive pushes them to get information, as Lonergan saw in his early childhood. Babies

play imitation games to figure out what people think. They play hide-and-seek to figure out how adults see objects. They babble to figure out language sounds (Gopnik et al, 152-153).

The developmental view of learning moves from creating complex, abstract, coherent representations of the world to expanding representations that go beyond what we see to capture something we think is true. Like adult scientists, children create and revise theories. This is *the theory theory.* Children develop theories about the world. The benefit of having a theory is that it directs attention and helps make comparisons. Theories go beyond the evidence and allow babies to make predictions about things they've never seen so they can act on the world in more effective ways. They never start from scratch. They modify and change what they know to gain new knowledge (Gopnik et al, 154-155).

The foundation children build as they solve these three problems advances the cognitive capabilities they can use at school. As it strengthens, cognitive literacy asks reflective questions such as: What do you mean? What do I mean? How do you know? How do I know? What thoughts are running through my mind? How are these thoughts influencing what I'm saying? How are my thoughts shaping how I see what's going on? Children need to experience the safety of asking these questions in learning environments.

1.7. Implications for Learning and Teaching

In the sections on emotional and cognitive foundations, we see that children move inductively and deductively as they learn about the world. Let's combine Lonergan's views on knowing and Maslow's insights about the emotions around feeling safe. As mentioned, Lonergan omits emotion, but identifies the cognitional process as including sensing, imagining, questioning, understanding, conceptualizing, reflective questioning, weighing the evidence, and judging.

Lonergan's approach doesn't focus on the content of thought, but on its process. To him, the outcome of the cognitional process is insight. He offers insight into insight, which requires him to talk about oversight. We may look at something and miss what's there. If we miss something that's already out there now, we engage in oversight. I examine insight and oversight in the section on imaginative literacy, but here's an example that digs further into Maslow's view on safe learning environments.

> Suppose Joyce is reading a math problem that asks the following question. Referring to the image of a clock, if the minute hand is at 12, and the hour hand is at 3, how many minutes will it take for the minute hand to catch up to the hour hand? There are three distances to consider, the problem goes on to explain. The first is the distance the minute hand travels. Call that X. How far will the hour hand travel during the same time? The hour hand travels 5 marks on the clock during the time the minute hand makes a complete revolution of 60 marks (Tekippe pp. 35-38).
> Joyce is stumped. She sees the answer is the 16 4/11-minute mark, but that makes no sense to her. Suppose Jake is in the room and hears her express confusion. He's wise enough to quip "math is hard," but he's shocked Joyce doesn't know how to solve the problem. He thinks, how could she miss the solution? What makes matters worse, as Joyce continues to look at the clock diagram, she suddenly sees both hands move. Meeting up means moving past the 15-minute mark together, as she first thought. She says aloud, "Of course, the minute hand is moving." Digital culture strikes again.
> Jake is astonished. His body language signals surprise. He says, "How could you miss the fact the minute hand is moving?" His tone conveys disbelief. Joyce is now on edge. He continues, "It's right there in the question. Didn't you see it when you read it?" It's quite possible Joyce won't ask Jake for help with math in the future.

Insight and oversight arise during a cognitional process. Someone else's oversight can seem ridiculous to us. Coming back to notice oversights and experiencing insight is personal. It's part of the thinking we must do for ourselves. Intervention is tricky.

Jake's emotional tone disrupts Joyce's confidence in her math skills. She wonders what he thinks of her intelligence. Many children face this situation every day at school. Not considering the minute hand's movement is an oversight. Joyce needs to notice it and wrap her oversight into her inquiry, but Jake's reaction gets in the way. As Maslow said, children can be distracted by adult reactions to their cognitional process, and shift attention from a math problem to focus on an adult's reaction, or in Joyce's case, not to lose Jake's respect. The cognitional process is personal. It's based on our own experience, on inquiry, and the emerging oversights and insights that accompany it. It's made up by our critical reflection, judgment-making, and deciding (Lonergan, xviii).

Let's consider how we understand learning and teaching. Two instructional approaches Thomas Aquinas (1225-1274) identified are an order of discovery and an order of teaching (Tekippe, 20). Lonergan refers to them as a logic of discovery and a logic of teaching. A logic of discovery works inductively. It starts with some small observations and builds toward general principles, as in early twentieth-century science. Teaching works deductively. We present learners with already formed, basic, general principles, or theories that students must memorize. Lonergan invests the cognitional process with a logic of discovery. But the emotional and cognitive foundations show that children move inductively and deductively (e.g., the theory theory). They have capabilities for both.

A teaching method is set of directives that serve to guide a process toward a result (Lonergan, 396) and is designed on either discovery or teaching. Suppose a teacher wants to teach urban elementary school children about parallel lines using a logic of discovery. On a sunny day, she prepares them with pieces of string and a partner. She takes them outside with the following instructions. One of you is to walk along one edge of the sidewalk. The other is to walk along the other edge of the sidewalk. Hold the string securely in one hand—the hand closest to your partner. Walk along the sidewalk until you get to the end of the block. Don't let the string slip out of your hand or go loose.

She brings students back to the classroom, listens to their thoughts, and asks for their observations. They now have personal knowledge—a sensation of holding a string equidistant from a partner and moving along the sidewalk. Learning about parallel lines is personal. This foundation helps them understand squares and rectangles and distinguishes them from triangles. The method respects children as knowers who solve problems through experimentation as they discover, identify, and become familiar with the activities of their own intellect (Lonergan, xix). There's

time later to understand more about parallel lines when they hear about Einstein's curved space theory.

This example suggests that a logic of teaching and a logic of discovery can go hand in hand. For example, lecturing is a method in a logic of teaching that can establish a baseline to allow learners to get the big picture of a subject they know little about before they begin to explore it in depth based on what triggered their interest.

In terms of a logic of discovery, there's a distinction between Lonergan's and Kuhn's views. Lonergan centered discovery on the emergence of insight and oversight. Oversights refer to missing something that's there to be seen. Kuhn's logic of discovery notes the emergence, not of oversights, not of things there to be seen, but anomalies - disruptions - something that won't fit the way we see the world. Anomalies violate expectations and predictions based on our current theory about how the world works. Anomalies suggest a theory must change. This is a paradigm shift, in Kuhn's language. He seems to imply the world itself changes (Kuhn vii-xxxvii) when we see an accumulation of anomalies.

Consider a small-scale paradigm shift toddlers experience as they realize mom and dad don't share a theory they built in the early years. If they're scientists in the crib, what sort of scientists are they? Kuhn describes normal science as research firmly based on one or more past scientific achievements that a community, in this case Tommy, relies on as a foundation for further investigation (Kuhn 10). A normal science approach isn't looking for, nor does it like, novel occurrences. It pursues what's worked within a paradigm (theory) and predicts what will happen next based on what's worked in the past (Kuhn 35).

Suppose Tommy is a toddler who's learning to walk, albeit in a wobbly way. Up to now, Tommy's theory about objects is that he can touch and explore everything within his reach. When he explores an object, mom and dad both smile at him. Suddenly, when he touches an object he couldn't reach before, mom and dad aren't smiling. They're upset. Tommy has learned to read emotion, so their reaction doesn't match his theory. Tommy begins to set his world right by trying to touch the object again and again. Surely, things will go back to the way they were. At this point, mom and dad must shift from a logic of discovery to a logic of teaching. Their son needs a more complex theory. Mom and dad must consistently offer evidence of the new theory by stating generalizations he hasn't needed up to now. This is a fundamental theoretical move Tommy must make as a foundation for realising, later, he can't explore or take other people's belongings without permission, especially those of older siblings. That never goes well.

In large-scale paradigms, if enough anomalies accumulate, Kuhn predicted that a revolution was on the horizon. The terrible twos can seem like a revolution. Kuhn's view of scientific revolutions changed how we think about science. In a similar way, to omit emotion from our understanding of how children learn sets us up for revolution. The four literacies, woven together, propose that school cultures must change. If we want children to flourish in their skill and knowledge, we must realise emotion and cognition work together.

In summary, children gather knowledge in the early years by looking, tasting, touching, smelling, and hearing. The mental activity behind the two metaphors for the mind are also based on looking. But the human mind is more than a video camera that scans everything passing before it. It can be aware of itself, understand, and know itself (Tekippe p. 15). Imagination is an aspect of that reflective process as well as part of cognition. To expand on our idea of cognition, we must realise imagination's role in all human thinking.

1.8. Entering a Wider World: Foundations of Imaginative Literacy

Children are emotionally invested, experimental beings who test the world by being personally involved in it. They make up theories about immediate, middle-sized, common objects, including people who care for them. They're immersed in evidence that's close at hand. Patterns they observe are shaped by their pure drive to know as they explore the world they inhabit. To expand their vision, imaginative literacy reveals a larger world for them to investigate.

Imaginative literacy provides children with scope that's absent from daily life. Day to day, we don't get perspective—like toddlers who can't see their whole body by standing in front of a mirror. We don't know where actions will lead. We don't sense where emotion might carry us. Imagination reveals patterns we see in no other way (Frye, 2020, xi-xv). In the early years, children decode patterns based on experience. Imagination helps them decode patterns in stories they hear and read. Seeing patterns helps them decide how to live. With a bigger picture, they see how people tend to feel, think, and act so children can predict what might happen next, (Frye, 2020) and apply these insights to their lives.

There are three ways to describe imagination. A common view is that imagination invents things. Dad says to his child: You're only imagining there are trolls under your bed. Go to sleep. When it comes to trolls, imagination creates false notions about reality (about what's already out there now). A second meaning asserts that imagination is essential to all thinking; without imagination the brain wouldn't be able to think at all. A third meaning focuses on literature. Imagination creates narratives full of beliefs and values to select from as we learn how a larger world works. I look first at the second meaning: imagination is essential to all thinking.

As they learn about the world, children ask for information in the way a four-year-old girl inquired of Jean Piaget. She asked him about elephants' wings. He responded by saying elephants don't have wings. She replied, yes, they do. I've seen them. Piaget replied she must be joking. Austrian born American child psychologist Bruno Bettelheim (1903-1990) considered this example. He realised that she struggled with a problem she expressed as seeing elephants fly. Piaget was trying to understand her by relying exclusively on a rational point of view. So, he dismissed her elephant theory. To Bettelheim, if he had engaged her in conversation about where the elephant needed to fly to in such a hurry, or what dangers it was trying to escape, issues she was grappling with might have surfaced in conversation because Piaget would have demonstrated a willingness to follow her method of exploring a problem (Bettelheim, 119-120). Reason and imagination function differently. Imagination is thinking that explores problems of childhood, while avoiding the dangers of actual experimentation (Bettelheim, 119).

The reason to educate emotion, cognition, and imagination is that they're linked (Warnock, 10). Given what we know about brains, it's compelling to consider Immanuel Kant's (1724-1784) concept of imagination. He positioned imagination spatially at a mid-point between perceptual and conceptual learning. Imagination informs both. Aristotle distinguished imagination from perceiving and conceptualizing (i.e., thinking) by saying imagination differs from both and influences judgments we make (Caygill). Aristotle and Kant situated imagination between brain-based activities Hebb uncovered. Imagination is a mental faculty, a

brain activity that works behind the scenes. In perceptual learning, every percept comes with an association, sparks an interpretation, informs our concepts. The missing link between sensory data and concept formation is imagination (Warnock, 10).

Thinking is much more than perceiving. If all we perceived was a succession of sensory datum, if we experienced individual images in an endlessly, relentlessly moving slide show, each impression would be separate and short-lived. Images would constantly move from one slide to the next (Warnock, 19), like a snowstorm of impressions blowing by us.

If we had nothing but sensory data to rely on, we'd believe the world is made up of fleeting, short-lived impressions. But that's not what happens once infants gain a certain amount of experience and realise that objects are *waiting* to be seen and exist continuously. Babies learn to come back to objects again and again (Warnock, 20-21) and come to believe in object permanence. How does the shift take place? The answer is imagination. Without imagination, we couldn't form categories or concepts (Warnock, 30). Imagination forms rules and methods to allow children to believe in object permanence.

As children learn about object permanence, they rely on (mostly) consistent images or impressions, e.g., the sun rising in the morning. Imagination disregards gaps from one day to the next (if something is slightly different) and regards each sunrise as the same as sunrises in the past. Imagination works with memory and gains a liveliness and force that constitutes a belief that the sun *will* rise tomorrow. A child runs to the window, looks out, expecting to see a sunrise. Image-forming imagination allows children to live in the world confidently, tell dad there'll be a sunrise to see, and identify friends and family members as the same people they saw last week or last year (Warnock, 29). Imagination slides over small differences until patterns form, just as they generalize about language prototypes.

As mentioned, Lonergan identified fundamental actions involved in the cognitional process as sensing, imagining, questioning, understanding, conceptualizing, reflective questioning, weighing evidence, and judging. As we consider the generalizing activity of imagination, which helps children establish fundamental theories about the world, e.g., object permanence, we see how to augment their learning when they come to school.

Children begin to develop skills for iterative intellectual activity in a cognitional process as adults invite them to sense more, imagine reflectively, question thoroughly, understand with clarity, broaden concepts, ask reflective questions, weigh evidence, and make judgments that they test out. Teachers begin by inviting children to see more (e.g., about sunrises) and by helping them pay attention, ask questions, and go back to look again, look ahead, look around, look behind to see what's available to them. Then, teachers invite them to consider the differences in data they gather.

A child's capabilities for gathering data and forming patterns in the early years is at the core of Lonergan's view about insight and oversight. At school, children use their learning capabilities to uncover more than what they saw when they were young and reflectively consider how theories and concepts might change with new information, now that they have an ability to see how their thinking has changed. Revision is an essential element in all learning, but the need for foundational knowledge is like the need to feel a strong personal confidence that I know about parallel lines. Nuance comes later. Initially, children need a strong, secure foundation for mental architecture that learning builds on over time as they revise their conceptual understanding. Suppose a boy, John, comes to school with a dread of spiders. What might he experience to extend his imagination about them?

As mentioned, children receive sensory data and organize it into concepts. With imagination something else is going on. Humans have mental representations of objects (people and things), but the brain is designed to focus on ideas and images that are no longer in front of us. When objects aren't present, the representation remains available. Imagination works with what's absent, what's no more, what's not yet, what's never been—like elephants with wings. Imagination relies on images in the mind, stored in memory, that are ready to become *a vision in thought* the moment the mind gets hold of them (Arendt).

In imagination, two things happen: we have mental representations of objects as we perceive them that may shift into memory. Imagination works with these representations to go beyond sensory data and memory. Ideas that go beyond (images, ideas, pictures) become suitable thought-objects as the mind actively and deliberately selects them. The mind learns how to deal with things that are absent and prepares itself to go further, toward things that are always absent, that can't be remembered, because they were never present as sensory data. Imagination goes beyond sensory data to consider things we've never actually experienced. This activity also allows us to reflect on what we're thinking.

To think reflectively about something, that something must be removed from our presence. Separation anxiety is an example. When mom is present, an infant doesn't think about her. When she isn't there, the infant thinks about her and cries until she sees mom. Thinking always implies remembrance. Every thought is an after-thought. If we think about someone who's absent, there's a sense in which we remove ourselves, step back, and think about that person. All thinking is about something that's already happened. Imagining eliminates time and space and interrupts ordinary activities. It anticipates the future as if it were already present and remembers the past as if it never disappeared (Arendt, 85). Educating a child's imagination is part of teaching them to reflect on their thinking so they can ask themselves good questions about theories they currently hold. The truth of our theories and judgments is significant as we discuss imagination. Some of our theories are more like trolls under the bed.

The third meaning for imagination is linked to literature. What does literature offer? It gives proportion and perspective. Frye quotes Marcel Proust who observed that in daily life, where everything dissolves into the past and we never get to know what's coming next, although we call it real life (Frye, 1991, 32), we never get a sense of an event's proportion in the scheme of things. We don't get perspective on an event's beginning, middle, and end. We don't see the scope of human action day to day. As we hear or read literature, we detach ourselves from daily life. We see what someone did and what happened because of what they did. Imagination gives us a better and a worse world than what we usually experience and compels us to keep looking at both. Stories show us what happens if people help each other and what happens if they harm each other. Stories tell us what's possible, even if our own world is limited and includes injustice.

To Canadian literary critic Northrop Frye (1912–1991) imagination shapes children's thinking. As they hear or read stories, they can identify values, and beliefs they may choose to adopt. Frye asks about the role of imagination in the learning process. He identified the place aesthetic decisions have in forming worldviews children gather by early adolescence. The first aesthetic decision they make is 'I like this. I don't like this'. These judgments are based on identifying with the text. As we read, we may feel either

split off from a text or feel it's part of us. We either say, this is part of me, or this is not part of me. We can see aesthetic judgments (I like it, I don't like it) as a continuation of what children do as they categorize. Feeling part of or not feeling part of creates a sense of connection or disconnection. Feeling "this is part of me" may become "this is what I want" (Frye, 1991, 4). Judgments, this is what I want, this is not what I want, are central to imaginative experience. What I want is the world I imagine. I imagine the world I want. Imagination creates a vision, a possibility, a model of a world we want to live in. This is literature's offer to children as they make their judgments about how to live.

An essential aspect of literature distinguishes it from science. Scientific inquiry moves forward. Knowledge evolves and improves. We know more now than we did two hundred years ago. But literature doesn't evolve, improve, or progress (Frye, 1991, 7). Stories produced by ancient Greeks are as good for us to read as they were for them. Shakespeare's plays are as rich a source of insight as they were in seventeenth century England. Medieval myths show us our heroes in ways that help us think about the sort of people we want to be. Showing what happens is what literature does (Goodrich).

Literature uses language to make associations. Recall that every percept entering the mind comes with an association. Literature reveals human patterns by using two main figures of speech to establish associations: analogy and identity. With analogy, if two things *are alike*, we call it a simile. With identity, if we say two things *are* each other, we call it a metaphor. A simile might associate Mom's face with sunshine. An infant interprets, I'm cosy, warm. Mom loves me. The statement, the moon is an 'old man' in the sky is a metaphor. Literature's purpose isn't only to describe nature. It reveals a world completely absorbed and possessed by a human mind at work. Our stories link humanity to the natural world and reveal associations between them (Frye, 1991, 10-24).

A literary writer isn't giving readers information like a science report. The author tries to let something take shape with a beginning, a middle, and an end, and relies on themes informed by reality. There's always a literary reason for using themes and patterns (Frye, 1991, 25). A story thinks and feels imaginatively. Literature offers themes that recur to describe the world we want to live in, and one we don't want to live in (Frye, 1991, 18). We notice positive recurrence (what we want) in stories that tell us how a boy or girl acts heroically. What we meet in literature is neither real nor unreal. An author's job is to tell us not what happened, but *what tends to happen*, not what did take place, but *the kind of thing that does take place* until we gain insight into universal themes that correspond to, represent, or resemble what happens in the world (Frye, 1991, 24).

There's a connection between truth and literature. Good stories, good storytellers, tell children the truth because they show what happens as people act in certain ways. What happens in the story hangs together so that children can predict what might happen next if they act in certain ways. All society, including family and friends, is based on imagination's role in revealing what's possible. Imagination is the power of constructing possible models for human experience. With imagination, anything goes that's imaginatively possible, but nothing really happens (Frye, 1991, 5). History tells us *what happened*. Literature tells us *what happens* and depicts patterns in human experience. History starts with the world as it took place; literature starts with a world we do or don't want to live in (Frye, 1991, 6).

Human beings live in a mythological universe, a unity of stories and recurrent themes that contain assumptions, beliefs, values, and themes developed in response to existential concerns (Frye, 1982, xviii). If emotional literacy asks reflective questions about what we feel, and cognitive literacy asks about what we think, imaginative literacy asks us to consider the world we want to live in. It asks what we want, how we want to live, how we want to treat others, and how we might engage with the natural world.

1.9. Implications for Learning and Teaching

An exercise I use with any age group blends emotion and imagination to help people say what's on their mind and describe some of their thinking. The goal is to situate learners in emotion and imagination to encourage authentic conversation. The exercise has three stages: an approach activity that brings learners' minds to where their bodies are by focusing attention and recording thought. Stage two explores a selected topic. Stage three compares an application outcome to stage one perspectives. The exercise helps people see how their thinking has changed.

Approach Activity: Learning through feeling. Teachers ask, describe and demonstrate.

1. Write a paragraph about your worst enemy.
2. No one else will read it. I promise.
3. Describe and demonstrate what compassionate listening looks and sounds like.

Exploration: Finding out more. Teachers ask and instruct.

1. Is there an animal your enemy reminds you of?
2. Read about the animal in the books we have in the room.
3. Select verbs from the description of that animal and make a list of the verbs.
4. Look at your first paragraph. Rewrite it by replacing its verbs with verbs from your animal list.

Application: What difference does it make? Teachers ask and instruct.

1. Read your second paragraph to your partner, who listens compassionately.
2. Write down a few sentences about what happened as you read it out loud.
3. If you're comfortable, tell your partner what happened to your own thinking.
4. Why do you think people write in metaphors?
5. How does writing help us figure out what we've experienced and what we think?

At this point, teachers can introduce poetry that uses animal metaphors to express emotion imaginatively, a role AI can play. It's important for teachers to carry out tasks they ask of learners. Here are two limericks I wrote when using this exercise with adults.

There once was a boy we named Billy
Whose behaviour was more than just silly
He loved to hurt others
His sisters and brothers
We hope he'll get better, but will he?

There was an old lady from France
Who said that she wanted to dance.
She swirled and she jigged.
She twirled and she swigged.
And kept us all tight in a trance.

1.10. The Future is Friendly: Foundations for Relational Literacy

The success of the exercise above depends on an emotionally safe environment. How can we shape the environment we want to have at school? If we think about the world we want, especially considering American political philosopher John Rawls' veil of ignorance, we'd likely design a world that's kind, especially if, behind his veil of ignorance, we wouldn't know our own status in that world (Rawls). It's hard to idealise a cruel world if you might be at its mercy. Yet, we know classrooms can be cruel. They may work if every learner has a friend, but classrooms won't encourage a love of learning if they're unfriendly. Relational friendliness can't be automated.

In her remarkable book, *You Can't Say You Can't Play*, American educator Vivian Paley describes her classroom as she applied a logic of discovery and a logic of teaching because she wanted to develop a new social mythology at school. She wanted a classroom where it was less easy for some to limit the social experiences of others (Paley, 3), so she helped them practice the rule: you can't say you can't play. She described the dynamics and difficulties she encountered as she tried to make the future friendly but faced the relational work that task called for.

While equality is what many teachers say they want to achieve (Paley, 21), Paley tracked the resistance to inclusion at kindergarten and discussed the concept with grades one to six children to collect their views on becoming inclusive. Her insights organize around what we might call *boss culture,* an identifiable pattern that showed up quickly. Even five years old children believe that a boss is someone who tells others whether they can play and uses social power to exclude those who don't have the boss's approval.

Bosses assign roles in a game and rely on materialistic assessments to judge others. Children are excluded if they don't bring the right toys or wear the right clothes. Rejected children know who they are (Paley, 15) and talk of rejection as if it just happened (Paley, 33-34), which is a characteristic of traumatic events. Children who are often rejected may continue to be rejected throughout their school years. They learn to be outsiders in every group, a status that influences their ability to learn, and instills a growing sense of rage. They reject others if they get a chance, even though they know how much it hurts to be left out.

The double-bind of boss culture has to do with power, with the power to control play by keeping people out. Every time Paley's students analyzed her rule, they analyzed the logic of their behaviour as well (Paley, 115), and acknowledged their own learning.

Paley demonstrates the role rules have in cultural learning. She saw that children first need rules to realise how to treat each other. If we consider the Golden Rule, treat others as you want them to treat you, her research uncovered a pattern of revenge: I'll treat you as I've been badly treated in the past, as I might be badly treated in the future, or simply, I'll treat you as I please, *because I can.*

As she helped children learn for themselves, her rule became a maxim. The shift moved from the logic of teaching to a logic of discovery. Maxims look like rules but have a different function (Kant, 84ff). A rule is an instruction we follow or break, e.g., Don't run in the hallway. A maxim is a principle of action that reasonable people use as a guideline they try out. Unlike rules, learning from maxims requires discovering what it means to do the right thing. Rules can be given before we understand what goodness is like, but not so with maxims. Maxims are tools we use to discover what's right and good.

Suppose John is an eleven-year-old boy in grade six. His school's rule is 'don't run in the hallway'. One day he enters the hallway to see a small child trip and fall down the stairs at the other end of the hall. John knows about maxims. He runs down the hall to help the child. He knows the rule but chooses to run because of his moral principle of 'respect for persons', and his freely chosen maxim, 'help when you can'. John is situated in his own thinking and operates from within. He acknowledges his obligations to others. He acts on his principle. But living by maxims is risky. John realises his action has consequences (he may have knocked over another child as he ran) and accepts punishment if that's what his school requires of him. But he can give reasons for his action to anyone who will listen. John's a good neighbour who acts with civility.

Paley saw 'you can't say you can't play' as essential to civility. She believed it must be presented at an intuitive stage of learning when children are willing to follow it because they trust adults (Paley, 87). In new settings, children expect to learn new rules. We respond differently if we think of instructions as maxims. With a maxim, children's imagination must begin working out what right actions look like, which, in an imaginatively rich environment, they can detect in good stories.

Paley's experiment also explores power as much as inclusion. Two children who struggle with power are Lisa and Curtis. Lisa complained that there's no point in playing at all if she can't control who can and can't play. During an inclusion conflict, she conveys an all or nothing strategy by saying, "But it was my game! It's up to me!" [Red-faced and tearful she said] "Okay, I won't play then, ever!" Slowly, as Lisa learned by trying, failing, and persisting, she was able to play with others, and assume leadership, without excluding others (Paley, 15).

Curtis, a tall, handsome, blond-haired boy, had a different experience with power. During an inclusion conflict, one girl complained she was always left out. A boy involved in the game responded,

> "'It wasn't me, it was Curtis....He's the boss. He says who comes in the club.' Curtis is visibly uncomfortable. 'I don't want to be the boss. They say I am.' 'We call him the boss,' the [first] boy explains. 'Yeah, because I make up the game. They *wait* for me to make up the game. Then I have to pick everyone or say no' (Paley, 45).

Curtis's discomfort is interesting. He's frustrated at having the role, as if he felt no freedom in it. Yet, even if he's uncomfortable, he believes being boss means rejecting others.

Friendliness doesn't fit in boss culture. In this classroom, learners were either friends or enemies—desirable or undesirable to play with. Simone Weil argues that human need is foundational to how we act toward others. Every child has the right to be in school. But a right "is not effective on its own, but solely in relation to the obligations to which it corresponds (Weil p. viii).

The friend/enemy divide erases reciprocity and hope for many children. Learners are thrown together with others they don't

know and may only share space with at school. Paley wanted them to include each other which means stepping outside a friend/enemy category. At school, they must envision a category of colleagues as well as a concept of friendliness that doesn't limit them from engaging with all learners. Children need concepts and categories that build relational literacy as they practice their moral/social obligations.

In terms of helping children with relational literacy, Lonergan's cognitional process ends with making judgments. How might children learn to judge others compassionately, accurately, honestly, fairly? Currently, judging has a bad reputation. We often hear someone say: Don't judge me. What they mean may be more like: Don't criticise me. Don't challenge me. You know nothing about why I'm doing what I'm doing. Few of us object to judgments such as: You look great today. That colour suits you perfectly. I love that suit.

What is it about judging that feels like judgmentalism? Lonergan doesn't promote judgmentalism. His cognitional process takes time. It's built on reflective questioning. Is it that judgmentalism is quick, harsh, and walks away from asking for the backstory behind someone's behaviour? What does it take to learn to judge wisely? It takes wisdom that comes from emotional literacy's focus on asking: What do I need from you? What do you need from me? Judgmentalism takes no account of emotion's serve and return. Judging wisely is a part of a cognitional process. It takes time to reflect on how my thinking is influencing my theories about you. It takes practice. The next section describes how an art of relational friendliness might get started at school.

1.11. Working With Others [WWO]

Paley established a classroom ethos designed for inclusion. This section outlines classroom practices that show children how to be friendly and collegial by engaging them in skills of relational literacy. During 2004 to 2008, I collaborated with Brighton University (UK) researcher Dr Cathy Ota on a program called *Working With Others* [WWO]. In June 2006, I was trained to use the program in the Brighton university context.

Working with Others [WWO] is a positive, pro-active approach to childhood issues around bullying. It grew out of Project SPRinG that carried out four years of research (2000-2004) in three universities in England: London, Cambridge, and Brighton. In 2004, the Brighton group (Dr. Cathy Ota and Dr. Lucia Berdondini) partnered with five schools to offer training aimed at creating a classroom ethos characteristic of WWO goals, values, and practices. As they partner with schools, WWO consultants conduct half-day and full-day in-service sessions three times per week throughout a school year.

WWO consultants began by introducing adults to what they called social/moral practices in face-to-face sessions. If an entire school contracted with WWO, consultants brought training to children 5-11 years old, and to teachers, parents, and administrators. WWO's success was evidenced by its growth. Beginning with five schools in 2004, the Brighton research team carried out training in fifty-five member schools by 2006. *WWO* training was based on the following aims:

- Create a whole class ethos among learners
- Explore issues around working as part of a team
- Identify other professional issues to provide training and support for adults

In 2006, the following results for teachers were evident:

- A positive change in relationship between teachers and learners
- A different role in the classroom as teachers became facilitators, who were more nurturing than teachers who simply delivered the curriculum
- More reflection in practice
- Greater job satisfaction and enjoyment at work (Ota & Berdondini)

Many teachers noted they'd been putting students together in work groups for a long time, but WWO helped them see they'd put children in proximity but didn't teach them how to interact together successfully.

Schools are public spaces where learners are required to interact with one another. It's often assumed they can be successful. With an increase in public awareness of bullying, dysfunctional relationships, and inappropriate behaviour, teachers realize the importance of showing children skills for sharing classroom and playground spaces. WWO demonstrated strategies to build and improve social/moral skills for working successfully together. Many of these activities can be searched on-line.

WWO skills focus on *respectful obligations* we have for everyone in the classroom. WWO consultants help children practice these skills. Through their involvement, children become aware of the human need to be effectively included in groups, particularly during group work times, as they experience what it feels like to be effectively included and have fun doing it. WWO social/moral skills focus on working together successfully by relying on three fundamental relational components: trust, communication, and problem solving.

Practices of *respectful obligation* need an explanation. As Weil observed, the young "should feel at home in the world of thought" (Weil, 50). An obligation to help others feel at home is rooted in shared human needs. It's expressed as we show genuine interest in someone and offer them our full attention. We show up and show interest. As Weil put it, our obligations to other people all derive, without exception, from humanity's vital needs. A sense of obligation is easy to misconceive as compliance that's demanded through force or coercion, humiliation, or social power, but the sense of obligation Weil describes arises from realizing we all need support from others. As with emotional literacy, we ask others what they need from us, and express what we need from them.

As Weil insisted, considered by itself, a sense of obligation is identical for all and not slavish or manipulative. It's established over time through practices of reciprocity that shape emotional, cognitive, and imaginative literacies and provide the basis for relational literacy. Children who weren't blessed by loving care when young, can enter classrooms designed intentionally as gathering places characterized by reciprocity so that the justice of mutual obligation is consistently practiced in this developing relational habitat (Bellous & Clinton, 2016) as a setting that receives the determined passion people direct toward saving the planet.

During WWO training, teachers make changes in their practice, examine their beliefs about childhood, and rethink teacher/learner relationships. Teachers I interviewed reported these changes. They felt they got to know their students better, were more thoughtful and reflective as they planned, and worked hard to include children who tended to be left out.

In the same way learners can begin to see each other as friendly colleagues. WWO challenges teachers to leave their position of

power and embrace roles of facilitator, guide, and fellow member of a classroom community. Children are empowered to make decisions and take more responsibility for their learning. They can learn to say what's on their mind as they're given voice during the process. In one classroom I observed, the teacher spoke to children respectfully, validated their ideas, and included all of them conversationally. It was evident she saw herself as an equal, but responsible member who exercised authoritative presence rather than acting as the one important, smart, *talking head* in the room.

1.12. Implications for Learning and Teaching

Children I observed demonstrated confidence, independence, interdependence, and security when asked to work with others. Although I didn't have opportunities to ask children how they felt about working in groups, from my observations they looked very comfortable working together, talked about feelings, and spoke freely about how things went during the activity. WWO's approach is shaped by a process with three parts: pre-briefing, the activity, and post-briefing.

1.12.1. Pre-Briefing

To provide opportunities for children to work together, teachers use curriculum-based tasks that could be completed individually and make them a group task. Pre-briefing is used to set up the task. Pre-briefing has two purposes: 1. teachers explain the curriculum focused expectations for a task; 2. teachers draw the children's attention to a WWO skill to work on, e.g., turn taking. Through modeling and role playing, teachers show children the WWO skill. I observed children co-creating poems by using a model poem they read as they worked on the skill of turn taking. In pairs, they were given one piece of paper and one pencil. The teacher modeled what good turn taking looked like and what to do when it wasn't their turn. I observed children taking turns writing their ideas, keeping each other on task, sharing materials, assisting each other with spelling words, staying on task, and working independently.

In **Pre-briefing**, teachers inform learners about WHAT, HOW, WHY. Teachers

- Introduce content [What]
- Introduce how content will be carried out [How]
- Identify skills needed to do the activity [How and Why]
- Establish the tone of the learning environment the activity requires [How and Why]
- Engage with learners about the purpose of what they're asked to do or make [WHY]

Teachers choose questions to ask in pre-briefing activities based on knowing their learners and encourage them to think of other questions to ask the whole group?

1.12.2. Activity

While the classroom was a noisy environment, as they worked on the poem assignment, children were on task and resourceful. Rather than asking the teacher for information, they made use of pictures on the walls, each other's ideas, and their own insights. They negotiated who would go first, whose ideas would be recorded on the one page they shared, and where ideas would be placed on that page. Children set goals for their group and encouraged each other to reach those goals. I observed them touch each other as they worked together. They gently touched each other on the hand or shoulder to get attention, share materials, and encourage one another. Having built trust, they used touch respectfully and meaningfully as they worked on the task.

These children were aware of others' differences and were willing to work with each other. In a literacy task, children were paired according to reading abilities: a child who had a higher reading ability was paired with a child with a lower reading ability. One teacher interviewed reported an example of a child who chose a partner she wouldn't have worked with in the past, but she did so because she saw that the other child was a good artist. The activity needed a good drawing. Children seemed comfortable accommodating differences and seemed comfortable working with those who had special needs.

1.12.3. Post-Briefing

To help children reflect on and improve their ability to work together, they have a relaxed time conversing with the teacher and each other. Two primary questions during post-briefing invite comments that assess how an activity went and how it might go better next time. Children appeared comfortable discussing challenges they faced when working with partners. Post-briefing questions helped children explore feelings and thoughts about how to improve working together. WWO teachers act as facilitators and ask open-ended questions to help children identify other skills they may still require. During post-briefing, noticing non-verbal feedback from the class is important. Teachers can check in later with individuals or small groups if necessary.

In **Post-briefing**, teachers inform learners about WHAT, HOW, WHY. Teachers record and remind learners about values and skills they practiced during the activity. Teachers

- Ask learners to describe the activity in their own words. [WHAT did they do?]
- Ask learners to name values and skills involved in the activity. [WHAT]
- Ask learners to say what's important about doing the activity. [WHY]
- Explore the learners' assessments of the activity. [HOW did it go?]
- Ask learners about handling difficult situations next time. [HOW and WHY]
- Record and remind about values and skills involved in the activity. [WHY]
- Ask learners about their feelings during the activity. [WHAT, HOW and WHY]
- Ask learners to indicate their assessment of their own part in the activity. [HOW]
- Gather suggestions to encourage learners to take personal responsibility. [WHY]
- Ask learners where they might use these skills and apply them elsewhere. [WHY]

Teachers use post-briefing to encourage learners to explore what they said and did in their groups or pairs and discuss what helped or didn't help. Careful, open-ended questions enable children to offer suggestions for better group experiences next time.

1.12.4. The Role of Teachers

Pre- and post-briefing demand specific skills. Teachers need to give themselves space and time to develop a style for engaging all three-stages. Only when teachers genuinely trust the class (and learners trust the teacher) can everyone entrust pre-and post-briefing to the whole group, however, trust is learned through practice. We learn as we go. WWO teachers remain mindful of how they phrase questions and comments. Are questions open-ended? Are comments non-judgemental? Do questions encouraging learners to say what's on their mind, and reflectively come up with solutions themselves? The three-stage process requires commitment and perseverance, but the rewards are worth the effort.

1.12.5. The Role of Learners

It takes time to introduce pre- and post-briefing to children until they understand and participate fully. Being somewhat different from other classroom dynamics they need to understand what's being asked of them, develop a vocabulary, and appreciate that often there aren't right or wrong answers in these thinking-together sessions. Teachers make clear to learners their freedom to voice difficulties, challenges, as well as pleasures with the process in a safe, friendly, respectful way. WWO encourages all participants to shape the environment, as Paley hoped her learners would do. Reciprocity is built into WWO's three-stage approach to learning.

WWO shifts away from boss culture. Other learners are colleagues and co-workers. Each child learns that school is work (make, do, and know). Success at school depends on others at times, and on learning how to work together effectively. Colleagues have a fundamental right to receive friendly respect and have a relational obligation to show friendly respect to others. Relational literacy is built as children engage with one another, ask and answer questions relevant to pre-and post-briefing, practice working together, and learn how to adjust and respond to the needs of their colleagues as well as to their own, as they accomplish these goals in public spaces at school.

2. Conclusion

The four literacies depend on mind work children carry out as raw materials of ordinary experience enter the factory of human thought. Mind work isn't something they accomplish on their own. Societies are measured by the way they treat vulnerable members (Clinton). Parents and teachers have an absolute social/moral obligation to teach children well. We're responsible to be human, which means we take on social/moral obligations willingly as we acknowledge our need for others, and we acknowledge that they need us.

Our ideals are realized through practice in face-to-face exchanges with people we care for and who care for us. If we learn by observing in the early years, we must continue to look around us for the world we want to live in. Seeing is believing. A cognitional process built on emotional literacy is strengthened by cognitive, imaginative, and relational literacies, which together reveal a worthy way to learn how to be fully human. In this present age, it's an essential pathway to human flourishing.

Perhaps readers would agree that the primary purpose of schooling is to educate the young. But far too many of us meet far too many people who are anomalies (Kuhn's violation of expectations), people who didn't graduate from school with self-knowledge about their skills, interests, abilities, or with any hope for the future. How many more 'anomalies' must we meet before we realize children are crying out for a whole new world at school. That world must be structured on what's essential to their humanity, and to the possibilities involved in human flourishing.

REFERENCES

[1] Adler, M. J. (1978). *Aristotle for Everybody*. New York: Simon & Schuster, Inc.

[2] Arendt, H. (1978). *The Life of the Mind*. New York: Harcourt Brace Jovanovich, 1978.

[3] Bellous, J.E. with J. Clinton. (2016). *Learning Social Literacy*. Edmonton: Tall Pine Press.

[4] Bellous, J. C. "Learning to Think [Together]" (2023). *Global Journal of HUMAN-SOCIAL SCIENCE: Sociology & Culture* Volume 23 Issue 7 ISSN: 2249-460x, 21-38.

[5] Bellous, J.E. "An Awareness, Action, Abduction Method of Inquiry," in Clark, M.B. & J. E. Bellous. (2025). *Thin Moments and Thickening Narratives*. Edmonton, AB: Tall Pine Press, 206-253.

[6] Bettelheim, B. (1989). *The Uses of Enchantment*. New York: Vintage Books.

[7] Caygill, H. (1995). *A Kant Dictionary*. Malden: Blackwell.

[8] Clinton, J. (2020). *Love Builds Brains*. Edmonton, AB: Tall Pine Press.

[9] Cornford, F.M. *The Republic of Plato*. Oxford: Oxford University Press, 1945.

[10] Davidson, R. (2012). *The Emotional Life of Your Brain*. New York: Penguin.

[11] Drucker. P. F. (1992). *The Age of Discontinuity.* London: Transaction Publishers. First published, 1968.

[12] Frye, N. (1982). *The Great Code*. New York: Harcourt Brace Jovanovich Publishers.

[13] Frye, N. (1991). *The Educated Imagination*. Toronto: CBC Enterprises/les Entreprises Radio-Canada.

[14] Frye, N. (2020). *Anatomy of Criticism*. Princeton: Princeton University Press. First published, 1957.

[15] Goodrich, N. L. (1961). *The Medieval Myths from Beowulf to the Cid*. New York: Mentor Books.

[16] Gopnik, A. Meltzoff, A.N. & P. K. Kuhl. (1999). *The Scientist in the Crib: Minds, brains, and how children learn*. New York: William Morrow & Company, Inc.

[17] Greenspan, S. I. & S. G. Shanker. (2004). *The First Idea*. Cambridge, MA: Da Capo Press.

[18] Hebb, D. O. (1980). *Essay on Mind.* New York: Psychology Press.

[19] Hebb, D. O. (2002). *The Organization of Behavior: A neuropsychological theory.* London: Lawrence Erlbaum Associates, Publishers. First published in 1949.

[20] Kant, I. *Education*. (1960). Michigan, University of Michigan Press.

[21] Klein. J. *Our Need for Others and its Roots in Infancy*. (1987). London: Tavistock Publications.

[22] Kuhn, T.S. (2012, 4th ed). *The Structure of Scientific Revolutions*. Chicago: University of Chicago Press.

[23] Lonergan. B. (1958). *Insight: A study of human understanding.* New York: Harper Collins.

[24] Maslow, A. H. (1962). *Toward a Psychology of Being*. New York: D. Van Nostrand Company, Inc.

[25] Ota, Cathy and Lucia Berdondini. (2007). Building Bridges and Right Relations: A study in fostering spiritual, moral and social growth through groupwork skills with young children. In M. De Sousa (ed.) *International Handbook on the Religious, Moral, and Spiritual Dimensions of Education* The Netherlands: Kluwer Academic Publishers.

[26] Paley, V. G. *You Can't Say You Can't Play.* (1992). Cambridge, MA: Harvard University Press.

[27] Piaget, J. (1952). *The Origins of Intelligence in Children*. Margaret Cook, Trans. New York: International Universities Press.

[28] Rawls, J. *A*. (1971). *Theory of Justice.* Cambridge, Mass.: Harvard University Press.

[29] Popper, K. (2002). *The Logic of Scientific Discovery*. London: Routledge. First published in English in 1952.

[30] Sebeok, T. (1994). *Signs: An introduction to Semiotics.* Toronto: Toronto University Press.

[31] Tekippe, T. J. (2003). *Bernard Lonergan: An introductory guide to Insight.* New York: Paulist Press.

[32] Warnock, M. (1978). *Imagination*. Los Angeles: University of California Press.

[33] Weil, S. *The Need for Roots*. (2023). UK: Penguin. First published in English, 1952.

[34] Wittgenstein, L. (1979). *On Certainty.* Oxford: Basil Blackwell.