LEARNING AND KNOWLEDGE CONSTRUCTION: KNOWING TO LEARN AND LEARNING TO KNOW

APPRENDIMENTO E COSTRUZIONE DELLA CONOSCENZA: CONOSCERE PER APPRENDERE E APPRENDERE PER CONOSCERE

Vincenzo Biancalana
Università degli Studi di Urbino Carlo Bo
vincenzo.biancalana@uniurb.it

Eleonora Lazzaro
Pedagogista Clinico, GruppoAcrobati dell'Educazione
lazzaroele@gmail.com

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ABSTRACT
The inevitable and necessary telematic adaptation of educational activities resulting from the pandemic period induced more than significant "learning losses" in average students. It is estimated that for female and male pupils in lower secondary schools, there has been a loss equivalent to that theoretically induced by a prolonged absence from educational activities of 0.6 years and a 25 percent increase in the same pupils/children below the minimum level of proficiency. We speak of learning loss or "loss of learning" at a time in history when the use of technological devices has taken hold to avoid the fear of a "gap." It seems more necessary than ever, however, to reappropriate the "human touch" as an element of knowledge co-construction through the creation of bonds of relationships. Let us take advantage of this fact for some considerations related to learning and knowledge processes.

L'inevitabile e necessario adattamento telematico delle attività didattiche conseguente al periodo pandemico ha indotto negli studenti medi "perdite di apprendimento" più che significative. Si stima che per alunne e alunni delle scuole secondarie inferiori ci sia stato un danno equivalente a quello teoricamente indotto da un'assenza prolungata dalle attività didattiche di 0,6 anni e un aumento del 25% degli stessi alunni/e al di sotto del livello minimo di competenze (Dorn et al. 2020, Hanushek, E. A., & Woessmann, L. 2020, Zhao 2021). Si parla di learning loss o "perdita di apprendimento" in un momento storico in cui l'utilizzo dei dispositivi tecnologici ha preso consistenza per evitare la paura di un "vuoto". Appare quanto mai necessario, tuttavia, riappropriarsi del "tocco umano" come elemento di co-costruzione della conoscenza attraverso la creazione di legami di relazioni. Approfittiamo di questo dato per alcune considerazioni relative ai processi di apprendimento e conoscenza.

KEYWORDS
Learning, experience, knowledge, motivation, awareness.
Apprendimento, esperienza, conoscenza, motivazione, consapevolezza

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Introduction[1]

Knowledge construction, learning and experience.

According to constructivist theory, individuals structure personal and world knowledge based on the elaborations of their experiences. Similarly, learning, commonly understood as stable modification of a behavior, is also believed to be induced by the interaction the subject has with the environment, that is, because of a series of conducted experiences. In other words, knowledge and learning both rely on experience as the common denominator of origin, but we cannot for this reason understand them as being the same thing. Knowledge, in fact, presumes and demands access to the manipulation of information and the activity of processing the possible representations that the information itself possesses, while learning offers the possibility of the intake of information and the subsequent eventual, but not taken for granted, transformation of it into knowledge. Knowledge and learning, in other words, can be in a close but also very distant relationship, since we can be faced with knowledge simply learned or knowledge understood, as well as we can learn without understanding or understand without learning. The examples could be endless. We report this simple study we conducted that appears very comprehensive. We formulated to students these two questions (underlying which is the same signification):

1) Are you familiar with Archimedes' principle?

2) Why does a rock sink and a ship does not?

We proceeded to divide the students into two groups A and B; the first group consisting of 53 members the second group of 41. From group A, we asked the statement of Archimedes' principle, from group B the reason for the ship's buoyancy compared to the stone. Forty-two out of 53 members of group A declared that they knew the enunciation by heart, while the question about the ship (group B) was answered by 9 out of 41 and with vague and incomplete arguments, revelations, that is, of a principle not perfectly understood! Having made this inquiry, we reversed the questions to the groups and the answers we got were

[1] The contribution represents the result of a joint work of the authors; however, Vincenzo Biancalana wrote the introduction, § 1 and part of the conclusions. Eleonora Lazzaro the § 2 and part of the conclusions.

almost identical: the utterance is memorized by most, while the meaning of it is, equally, by most, ignored. We then asked the same students to formulate two sentences, one with the present participle and one with the past participle. No one was able to formulate/enunciate a correct sentence, although they all knew how to adopt properly the two different participles in a conversation.

In essence, many have learned the Archimedes Principle without understanding it and all have understood the use of participles without knowing (learning) its rules of construction. Learning without understanding and understanding without learning!

For knowledge, somewhat the same yardstick applies: with regard to the Archimedes Principle we are faced with knowledge learned but not understood, as with participles faced with knowledge understood but not learned.

As said, many similar examples could be given and each of them would lead to the same conclusion, or rather: if the datum is taken as mere, inert information, it carries with it no content and has little reason to be if it is not disposed to comprehension and an extension of meaning, if, that is, its implicit content does not become explicit and other than itself. Indeed, what would be the point of knowing by heart Ungaretti's short poem, *Si sta come d'autunno sugli alberi le foglie*, if one remained anchored to the figurative sense of the phrase without understanding the parallelism between autumn and death, soldiers and leaves and everything else? Probably none! Mechanical learning[2], exclusively mnemonic learning is, in other words, only useful for the storage of a piece of data that, if not elaborated and conjugated to others previously learned, remains pure notional sediment. Quoting Montaigne, Morin[3] makes it very clear that a well-made head is better than a well-filled head. A head in which knowledge is limited only to the summation of the information it gathers is not a head predisposed to the transformation of meanings, to the elaboration of their potentially conjugable linkage and, therefore, to the possibility of giving meaning that is other than that implied in the information itself. If I collect grain (information) in the mill (head) but then do not provide for the various stages of its processing (transformation) such as cleaning, milling packaging, storage, etc., that grain will never become flour, bread, pasta, cookies... It will remain just and always itself and the farmer will not

2 Ausubel, D. P. (2004). *Educazione e processi cognitivi.* Milano: Angeli.

3 Morin, E. (1999). *La testa ben fatta.* Raffaello Cortina Ed.

grow, just as his farm will not develop. "*Information is a raw material that knowledge must master and integrate*"[4]

Following this reflection and returning to the Invalsi tests, even reading, if employed mechanically as an expression of a skill of coldly transforming graphemes into phonemes, has little meaning: the possession of a skill that is stationary and used largely only for pronunciation that is too often meaningless, the same as that used by someone who sings a song in a foreign language without knowing its meaning: a mere enjoyment, ephemeral and closed in on itself.

Dewey[5] puts it this way about skill: "*The acquisition of isolated skills and techniques through exercise is opposed to the attainment of them as means to ends that meet vital needs*. [...]". Where in vital needs we see, precisely, knowledge as the foundation of development. Skill alone, though indispensable to achieve the end, has little to offer. The concept is well expressed in Hull[6] description of the vertical and transversal functions of our cognitive system.

In that exposition he points to skills as vertical functions, (reading, writing, language, motor skills...) and recognizes cross functions (categorization, control, planning, representational redescription...) as the implicit cognitive mediator of the subject's functioning (through skills). I can learn how to ride a bicycle (vertical skill/function) but if I do not have the ability to control the situation (transversal function), if I do not combine that skill with the rules of the road, if I do not foresee the consequences of speed if, that is, I do not extend the concept of that skill, if I assume it without re-describing it, it will remain a skill without efficacy: I will not be able to use the bicycle to go to school or to work. To put it more clearly: it is possible for a person with intellectual retardation to learn the skill of riding a bicycle, but it is equally difficult to see him or her riding the bicycle, alone, around the city. Between vertical and transversal functions, therefore, there are strong links of interconnection, (transversal functions would make almost no sense, without the means offered by verticals) considering, however, that vertical functions can develop and consolidate partially autonomously from transversal functions. And so we return to the ability to ride a bicycle without being able to get around town or the ability to read without understanding the meaning of what one is reading.

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4 Work cit.

5 Dewey, J. (1938). *Esperienza e educazione.* Raffaello Cortina.

6 Hull, C. L. (1943). *Principles of behavior: an introduction to behavior theory*. Appleton-Century. Oxford, England.

We are born immature and are among living beings those who have the privilege of living the longest period of immaturity (at 25 years of age, the prefrontal cortex is still forming). Andrea Canevaro speaks of the logic of bricolage[7] as the ability to reshape thinking about a reality that reoccurs, which you have not sought but which has come to you. In bricolage there is the aspect of "putting information aside and then taking it back as useful the moment it becomes useful." "*Usually the word 'bricolage' is not translated into Italian. Its translation as 'do-it-yourself' certainly contains a sense of initiative. But also, a sense of amateurism that confuses the meaning, and can create misunderstanding. A good craftsman, far from being an amateur, who uses a piece created for one function by attributing to it a quite different function, is DIYing. He combines and interweaves his design and the giving of materials. And this giving may suggest changing the design, improving it. It is evolutionary innovation. It breaks, and puts in apparent disarray, a design procedure by having new results discovered".*[8]

Transversal functions appear as equally basic as vertical functions in order to live. Human beings learn by coming alongside another human being, integrating their own functions with those of the other. Here is where my ability to ride a bicycle, my "can do" turns into a "can do if," setting in motion the thought that no one can do a thing unless it is organized in a context.

Thinking back to Dewey, we can extend the same consideration *to experience*, which, as we have seen, is the common basis of the two concepts of learning and knowledge. In fact, it is not appropriate to refer to it without considering its meaning and projections. Experience, in fact, is not merely encapsulated in what we believe it to be, that is, contact/relationship with a particular area of reality. What matters, he says, is the *quality*: some of them promote, in projection, the acquisition of new experience, while others limit the possibility of it. And true experience, that which we must understand as promoting awareness, maturity and self-development, is such only if it carries with it the peculiar quality of being able to influence the experiences that will follow it. That is, there is a principle of continuity of experience, says Dewey, in which "...*every experience receives something from those that preceded it and modifies in some way the quality of those that will follow*."

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7 Canevaro, A. (2015). *Sul rapporto tra educazione e mondo più giusto.* Studium Educationis anno XVI - n. 3.

8 Work cit.

Awareness of the principle of *continuity*, as the evolution of a present experience, into the future, opens up several considerations. First, Dewey considers that "*Foresight of consequences necessarily involves the activity of intelligence*." Knowing, which does not remain "simply" fixed to the act and stored in the mind, but which escapes from it to seek other meanings and possibilities that may produce other knowledge of a higher degree is, that is, strongly bound up with rational activity.

This introduces another fundamental principle referred to as that of growth. Education can be defined as such when the continuity of experience accords tangible growth to the individual, which takes the form of the ability to take on new experiences useful to his or her process of interaction with the world and autonomy. Knowledge is also an experience, a construction, a deep and committed relationship with others, near and far, in presence and absence. Ivo Lizzola[7], full professor of general and social pedagogy at the University of Bergamo, "*To know is to be able to make things new*."

From this point of view, the need arises to "structure" in the educational context, especially school, appropriate experiences whose quality can stimulate the desire and need for awareness of what is being accomplished. In other words, adopting opportunities for emotional, collaborative, and affective towing, enthusing, and stimulating together the production of new ideas. Only in this way can the experience, and what it supports, be protracted over time, and become useful material for subsequent skills. The teacher, says Dewey, "is responsible for creating the conditions for a kind of present experience that will have a favorable effect on the future."

Schoolwork, whatever subject, or discipline is proposed, is hermeneutic work, research, inquiry, rethinking and repositioning, where mistakes are contemplated and not avoided because they are basic to being able to question and evolve.

In such a perspective, a reversal of understanding about educational delivery appears inevitable, namely, an awareness of the fallacious thinking of a learner understood as a "lapdog" of the information that has been "thrown" at him. The teacher must not, in other words, merely provide content and expect its orderly return, but must, rather, attract the learner to the same content by making it material of interest and participatory discovery. Cognitive skills are not acquired by adaptation to demands. In this exchange, therefore, it is not the information that reaches the pupils, but it is the pupils who feel attraction toward it. Only in such a

process will the possibility be offered for the Archimedes Principle to become not just a mnemonic utterance but understood knowledge.

School, which looks at preparation for work contexts and business organization, should likewise look at preparation for life with resilience to adversity, disappointment, defeat, management of urgencies and uncertainties, cooperation between systematicity and creativity. It is living in the web of a complex life organization.

1. Interest and curiosity: what are they activated by?

So, we see how there can be no acquisition or development of new knowledge/skills unless the learnings are rooted in a concrete experience that substantiates curiosity and consequently interest.

Let us introduce a new concept into the reasoning: that of motivation, that is, the drive that enables us to achieve the goals we have set for ourselves, or simply the engine of our pursuit and discovery of life. That engine that makes experiences open to other experiences that, one after another contribute to increasing our awareness. But let us go in order.

Wanting to give a more precise definition of what motivation is, we can call in De Beni and Moè (2000)[9], who define it as a configuration of subjective experiences that allows us to explain the initiation, direction, intensity and persistence of a goal-directed behavior.

Several theories explain the correlation between motivation and learning. The starting point is always the differentiation between intrinsic and extrinsic motivation. The former inheres curiosity and interest, seemingly ends in themselves, while the latter is nurtured by rewards and seeks to avoid punishment.

From the latter develops what is now referred to as the *Token Economy*: basic behaviorist consists of a form of agreement, whereby for each correct behavior, a token (or other symbolic object) will correspond, and for each infraction, one will be taken away or none will be awarded. In exchange for a certain number of tokens, access to a certain reward will be granted.

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9 De Beni, R. Moè, A. (2000). *Motivazione e apprendimento.* Il Mulino Ed.

Reinforcement theory is based precisely on the fact that, a student driven by extrinsic motivation studies for good grades, rewards from parents, and not out of a desire to learn.

Here's another important word popping up. It is especially so if it opens us up to reflection regarding the fact that several studies show how the effect of reinforcement in the long run is not exactly as hoped, although it is bestowed sparingly, consistently, and punctually truthfully.

Intrinsic motivation in fact is very much related to the concept of desire, a word that in its many etymologies, presents the most suggestive in the one that wants it derived from *de-sidera*, that is: in the absence of stars. Ilaria Gaspari (2021)[10] explains it well, telling us that the stars were the map that sailors followed on nights of navigation on the sea, to orient themselves when maps were something very relative. Desire then is that which arises now when the stars are not visible and therefore cannot be read or questioned. Desire is that drive to go back within ourselves to seek and find the motivation to continue the journey of discovery, growth and awareness.

Desire is the root of intrinsic motivation, by which a person (or a student if we limit our reflection to the school learning context) then engages in his or her own growth (or study tasks), to increase his or her skills and for the pleasure of learning and becoming more aware. This maieutic process of self-knowledge and gaining awareness is supported in a substantial way by the belief developed by each person about his or her own intelligence: those who possess an entitary view of themselves believe that intelligence is a set of skills that are unmodifiable with experience and therefore cannot be improved. Those who hold an incremental view, on the other hand, believe that intelligence is modifiable and improvable through experience.

From an entitary view arise predominantly performance-related goals (knowing the formula for Archimedes' principle by heart), from an incremental view, on the other hand, mastery goals will result, allowing us to use the experiences underlying the learnings, to introduce and orient us to new experiences, which will bring with them further learning and competences.

Without generalization and absolutely in theory, it would be inferred that the student with an incremental view of self will most likely tend to choose performance goals in order to have demonstration of his or her skills that he or she

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10 Gaspari, I. (2001). *Vita segreta delle Emozioni.* Super ET Ed.

does not believe are modifiable and will develop an extrinsic type of motivation because he or she is focused only on the outcome. Whereas the student with an incremental view will predominantly choose mastery goals and his motivation will be intrinsic because it is aimed at growing his skills.

However, for both, in the absence of desire, all motivation will vanish, leaving them in the complete absence of any intention to act, in which any sort of commitment will be totally absent: demotivation.

2. How do we teach today to cultivate desire?

As parents, but often also as teachers, we tend today not to fatigue the youngest. Few no's, few defeats are considered useful for growth. Because divergent thinking itself has become a problem, anomaly constitutes a nuisance. Instead, many are the sad passions, to quote Miguel Benasayag in the book of the same name[11] in which the authors argue that [...] "Such an ideology (utilitarianism) claims to constitute a transparent world, in which we can always judge each human being according to clear, precise and unambiguous criteria: quantitative criteria. [...] A child who gets bad grades in school: although he is a multifaceted and contradictory person, he will still be judged only by grades and will simply be told that he *has problems*. For him, the grade becomes, very early on, the equivalent of wages for the parents. [...] learning problems are revelatory of a difficulty of desiring in life, of desiring life."

We are no longer very trained to deal with the uncertainty of what we do not know, we need to know everything (we no longer rely on desire to orient us), and in parallel, the disparate information to which we have access today creates experiences of anxiety and fear. Therefore, categorization - a fundamental process so that new experiences will also be useful in the future - becomes our salvation and at the same time our limitation, the cage in which we claim to be able to name everything right away. We are not even very good at giving possibilities anymore, at welcoming the unexpected and allowing ourselves to be surprised. Instead, these skills are precisely those that allow us to develop transferable skills, which through new experiences, generate other skills and not simply the achievement of cold, quantifiable results.

11 Benasayag, M. Schmit, G. (2003). *L'epoca delle passioni tristi.* Feltrinelli Ed.

For a learning to be consolidated into competence, it is necessary to think in an ecosystemic way and to make it possible and interesting for each person to invest his or her learning in an ecosystemic dimension, with one's "ability to organize and adapt through elements of mediation with the structures around us, with the contexts".[12] And again, "An educator (and also a teacher we add): has many facets. He is a competent companion, and *also* a companion who knows nothing, but *also* an informed informant, but also a jester, artisan, farmer, computer scientist and *also* or above all an acrobat".[13]

Recalling Vygotsky[14] and his zone of proximal development (ZSP) we reiterate the need for an ecosystemic view of the educational context, in which everyone is a node of exchange: we are able to learn through the help of "experts" (those who have already acquired somewhat more complex skills) who share that context. In this proximal relationship, the response is not toward expectations involving deadlines set by others, and learning will be more natural and spontaneous. In the mid of the 70s, Jerome Bruner developed the concept of *scaffolding*, whereby with the help of experts, a child is able to perform certain tasks despite not yet having the necessary skills. *Scaffolding* acquires the meaning of a set of helping strategies used by an expert to facilitate a child's learning process. In the 1980s, Canevaro and others proposed the methodology of "Integrative Background" with a view to inclusion, based on the unity of the educational pathway, consisting of a context (ecosystem) that all children (pupils) can recognize and through which they are able to integrate, being able to perceive the interconnections and links of continuity. It can be compared to a narrative that connects different elements of reality and is constructed as it is experienced. Through this methodology, the learning environment can be organized by allowing students to have experiences that are related to their life context.

Knowledge demands passion, commitment, and effort. It predicts failure, adjustment and the conquest of new knowledge. Socrates who was the son of a sculptor and a midwife urges us to know ourselves and seek the beautiful through RMA. In asking ourselves questions, never ceasing and without necessarily finding immediate, quick answers, seeking rather the beauty that elevates and moves us to the plane of relationship with the other who is different from us, but of whom

12 Canevaro, A. (2015). *Sul rapporto tra educazione e mondo più giusto.* Studium Educationis anno XVI - n. 3.

13 Work cit.

14 Vigotskij, L. (1934). *Pensiero e linguaggio.* Giunti-Barbera.

we recognize an important value for our growth. That is why a good teacher never stops learning and struggling together with his students.

Contrasted with cold, quantifiable knowledge, there is warm knowledge, defined by neuroscience as warm cognition[15]. Learning is a complex process in which emotions play a key role. Warm cognition defines a warm relationship as one in which children can express their needs without fear. If while learning we experience fear, every time we recall that learning we will also recall the related fear and tend to shut down. Conversely, if the emotion is one of well-being, there will be openness and disposition in us to welcome new experiences.

We can then say that in order to transform learning into competence, each human being must be motivated by desire, willing to struggle and start from an experiential situation of sharing and well-being.

Conclusions: Regaining the bodily dimension of experience

The inevitable and necessary telematic adaptation of educational activities resulting from the pandemic period has not only induced in average students, more than significant "learning losses," but is dangerously aggravating the separation between real experience and virtual experience.

From our analysis and consequent reflection, there emerges in this second type of experience the risky lack of those important references that underlie the structuring of learning and the fundamental bonds of growth.

Referring to the theoretical lines of *Embodied Cognition* (EC) we know that the mind is independent form of the body but is inscribed in it. From this perspective, knowledge can only be an "embodied action." The mind must be given back body, since it is now established that the cognitive activities of human beings, consist primarily of immediate interactions with the environment (1991 Varela, Thompson and Roch)[16]. Mental activities (and learning most of all) are inseparable from the body and are permeated by bodily structures and related dynamics. Sense-motor experiences are the basis for the formation of concepts and categories, determining how the world outside us appears to us. Knowledge as "embodied action" therefore

15 Lucangeli, D. (2021). *La mente che sente.* EricksonEd.

16 Varela, F. Thompson, E. Roch, E. (1991). The embodied Mind - Cognitive Science and Human Experience. Mit Press.

requires the simultaneous encounter and participation of brain, body and environment.

In the direction of the interdependence of mind, body, emotions and environment has also gone, for example, in medical science, developing PNEI (Psycho Neuro Endocrine Immunology). "[...] no longer body as a Cartesian machine, but as an expression of a phylogenetic development formed over 4 billion years. In the new idea of well-being, the body is an integral part of the person's identity; it is, with respect to well-being, the conjunction between nature and culture, and the body becomes the basis of our emotions"[17] (Enzo Soresi 2006). To this reasoning we place side by side the findings of modern neuroscience, in particular the *Warm Cognition* approach, which shows us that a student's well-being is closely related to his or her learning process, since "[...] while the notional content of what he or she succeeds in learning goes into his or her procedural or semantic memory, the emotional memories related to that particular experience-that is, all the emotions experienced by the student in that circumstance, including experiences of inadequacy-are destined to end up in his or her autobiographical memory (that is, the memory of who we are): whenever the child "repeats" in memory that particular notion he had learned, he will inevitably recall the related emotions as well. The risk is to create in the student a long-lasting experience of inadequacy that can also severely affect his or her level of self-esteem. This can happen especially if feelings of inadequacy are experienced over a prolonged period of time since the child will perceive himself as unable to perform a certain task and the reiteration of failure will only confirm this belief by feeding the vicious cycle of learned helplessness" (Lucangeli 2015).

We understand well then how crucial it is, that the learning process is always supported by a positive emotional climate that generates in the student a sense of self-efficacy.

Returning to today's situation: the massive impact of devices that mediate relationships (including educational ones), looking at each other through screens or not looking at each other at all, the lack of physical contact and proxemic language, often even the distortion of inflections in the tone of voice or the total lack of the latter in the written communicative exchange (used as prevalent by many adolescents for example), generates severe experiences of anxiety and disorientation, recursive thoughts about the self-image in the minds of others, of

17 Soresi, E. (2006). Il Cervello anarchico. UTET

which there is little feedback because it has become increasingly difficult to look each other in the eye or sense a smile. This generalized anxiety is on the rise, in direct proportion to the fear towards a future that, rather than distant, could be said to be ephemeral. It is an emotional climate of unease that not only undermines bonds and the consolidation of a secure identity, but also makes learning difficult, when not impossible, by precluding curiosity about each other and the outside world. Through emotions, the brain processes the value to be attached to information that comes from sensory channels, in a given experiential and learning context. Therefore, and in light of what has been written so far, it is worth pausing to speculate on the ameliorative possibilities that a focus on facilitating factors from the body for experiential learning provides.

It is necessary to consider, for example, what activates attention and how it is managed so that it becomes concentration. Factors related to the spaces experienced, whether they are cozy, adequately heated or cooled depending on the season, whether they are perceived to be familiar, whether they offer elements that intrigue and habituate to beauty, whether they are sufficiently lit, whether they allow a sufficient level of stillness and silence when needed. Other important elements are, for example, the possibility of movement and involvement in activities that postpone each person's value in the relationship (if doing if...), of organizing the space by zones and moving groups, of structuring the activity itself with variations of rhythm involving both sitting and standing postures, movement.

So that the body does not lose interest and fold in on itself. The body must then be nourished and hydrated. Augusto Boal, father of the Theatre of the Oppressed, told how it was possible for him to start learning, only when he began to eat properly, thanks to the food they could afford after his brother started working.

It is then essential to feel listened to and an active participant in new discoveries.

Today in Italy, educational experiences inspired by approaches that favor outdoor activities, in contact with the natural dimension of the forest, for example, are multiplying, but even without taking radical positions, we feel like affirming the urgency of a return to the concreteness of physical experience as the preferred route to effective learning, especially in schools. The corporeality of learning, especially experienced in sharing sizes us up, as it sizes up our fears, our expectations of the future and allows us to discover ourselves, others and increase awareness and knowledge.

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