

Beyond Mimesis: Algorithmic Empathy as a Cognitive Prosthesis a Case Study on Early-Onset Schizophrenia and Digital Mediation. from Chaos to the Timeline: Video Editing as a Thought Organizer.

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ABSTRACT

Vocational education today confronts complex psychopathological frameworks that challenge traditional teaching methodologies. The present contribution analyzes an educational intervention concerning a student with a dual diagnosis of Early-Onset Schizophrenia and Oppositional Defiant Disorder (ODD). Proceeding from the premise that the psychotic mind fragments temporal and causal experience, the study hypothesizes that non-linear video editing technology can act as a "cognitive prosthesis" for the reorganization of thought. Through an action-research design, a protocol was implemented based on the Formative Contract and the use of DaVinci Resolve software as a "cold" and non-judgmental environment of mediation. The results highlight a significant reduction in problem behaviors and an increase in Time on Task (from 15 to 50 minutes), reaching states of Flow otherwise precluded within the classroom. The article discusses these outcomes in light of the concept of "Algorithmic Empathy," proposing the machine not as a substitute for the human, but as a transitional space (or *auxilium*) which, thanks to its binary logic, allows the student to clear the field of persecutory anxiety and reconstruct a shared narrative of the self.

INTRODUCTION

In the landscape of the Italian school system, vocational education has undergone a profound metamorphosis, sanctioned by Legislative Decree No. 61/2017, which redefined its identity no longer as a residual pathway, but as a "school of innovation" founded upon the personalization of learning [1]. However, this regulatory framework clashes daily with the phenomenological complexity of the "new educational emergencies," particularly with severe psychopathological conditions that challenge traditional pedagogical categories.

This contribution focuses on the educational management of the so-called "Dual Diagnosis" during adolescence, specifically the comorbidity between Early-Onset Schizophrenia (EOS) and Oppositional Defiant Disorder (ODD). According to international clinical literature, such a condition entails an epistemological fracture in the perception of reality: the positive (hallucinations) and negative (avolition) symptoms of schizophrenia, as described in the DSM-5 [2], intertwine with the defensive mechanisms of ODD, generating a "coercive cycle" that causes the school environment to be perceived as a threatening place [3].

Faced with the failure of merely containment-based approaches, a paradigm shift becomes necessary, one that integrates the Bio-Psycho-Social model of the ICF (International Classification of Functioning) [4] with the new frontiers of Media Education. The central hypothesis of this work is that digital technologies—and in particular non-linear video editing—should not be understood as simple didactic aids, but rather as "cognitive prostheses" in the sense attributed by Donald Norman [5]. If the psychotic mind fragments temporal and causal experience, the digital interface offers a logical "exoskeleton" capable of vicariating the deficient executive functions.

Such an approach inserts itself into the wake of Papert's Constructionism, according to which learning is an active reconstruction of meanings through the manipulation of artifacts [6], but it ventures further, exploring the unprecedented concept of "Algorithmic Empathy" [7]. In this perspective, human-machine interaction, precisely due to its binary and non-judgmental nature, creates a safe transitional space—an ethical as well as technical

auxilium—allowing the student to reappropriate their own existential narrative in a context protected from social anxiety [8].

Methodology and research design The study adopts a situated action-research approach, aimed not merely at clinical observation but at the explicit modification of the learning context [9]. The intervention was conducted on a single subject (case study) aged 17, attending the third year of the "Cultural and Entertainment Services" vocational track, carrying a diagnosis of comorbidity between Early-Onset Schizophrenia (F20) and Oppositional Defiant Disorder (F91.3).

Negotiation Protocol: The Formative Contract To disarm the oppositional dynamics typical of ODD, a Formative Contract was implemented, founded upon the transparency of intentions and the reversibility of agreements [10]. The strategy utilized the student's absorbing interest in music (specifically the Trap genre) as a positive reinforcement. The agreement envisioned a rigid temporal scan: 20 minutes of technical work on the software (educational objective) alternated with 10 minutes of autonomous management of the classroom playlist (gratifying objective). This approach allowed the Locus of Control to shift from the external (obedience to authority) to the internal (personal responsibility), fundamentally reducing persecutory anxiety.

Technological Setting: Editing as a "Cognitive Exoskeleton" The learning environment was structured around the video editing workstation, utilizing the DaVinci Resolve software. The technical activity was designed following the principles of Embodied Cognition, where targeted motor action supports abstract cognitive processes [11]. The operational protocol was articulated in three sequential phases, each aimed at vicariating a specific deficient executive function:

1. **Ingest and Selection (Attentional Filter):** The request to select useful clips and discard irrelevant ones acted as training for the inhibition of distracting stimuli, a function usually compromised in schizophrenic frameworks [12].
2. **Assembly (Logical-Temporal Structuring):** The use of the Timeline allowed for the "spatialization" of time. Constructing the sequence on the temporal line forced the student to exercise causal logic ("first A, then B"), countering the fragmentation and derailment of psychotic thought.
3. **Fine Tuning (Error Control):** The possibility of modifying the edit without irreversible consequences (Undo function) offered an error-tolerant environment, reducing the activation of ODD defensive mechanisms linked to performance frustration.

Data Analysis The monitoring of the intervention utilized systematic observation tools (ICF-CY grids) to detect two primary indicators: the frequency of problem behaviors (aggressive acting-out) and the duration of sustained attention (Time on Task) in structured vs. unstructured contexts.

Results The analysis of the data collected during the observation period (T1: initial trimester vs. T2: final pentameter) highlights a trend of behavioral stabilization and a significant increase in cognitive performance, validating the hypothesis of technology as an effective mediator.

Quantitative Indicators: Reduction of conflict and State of Flow Systematic monitoring revealed two statistically relevant variations in the student's functioning:

- **Abatement of problem behaviors:** In the T1 period, the frequency of reactive aggression episodes (acting-out) stood at an average of 3 weekly events. In the T2 period, following the implementation of the Formative Contract, the episodes were reduced to sporadic events (<1 every two weeks). The predictability of consequences, guaranteed by the negotiation protocol, disarmed the persecutory anxiety typical of paranoid comorbidity.
- **Increase in Time on Task (Sustained Attention):** The most significant data emerges from the comparison between different educational settings. While in theoretical frontal lessons the sustained attention time never exceeded the 15-minute threshold, in the software-mediated video editing sessions a tripling of performance

was recorded, with continuous sessions of approximately 50 minutes. This result suggests access to a state of Flow (optimal experience) [13], made possible by the immediate and unambiguous response of the technological medium, which acts as a "prosthesis" for focus.

Qualitative Analysis: "The noise of the world" as a shared narrative The final artifact produced by the student, the short film *Il rumore del mondo* (The noise of the world), represents the point of synthesis between technical rehabilitation and identity restructuring. Through the intentional use of overlapping audio layers and syncopated editing (jump-cut), the student objectified their own experience of perceptual fragmentation. The screening of the work generated a change in the classroom ecology: the visualization of the symptom allowed peers to transition from stigmatizing judgment to empathy. As theorized by Bruner, the narrative allowed for the "taming of the unexpected" [14], transforming the pathology from a relational obstacle to shared communicative content.

DISCUSSION AND CONCLUSIONS

Algorithmic Empathy as Elevating Innovation The empirical evidence emerging from the case study transcends the perimeter of special education to invest the ontological status of technology in care processes. The collected data—in particular the transition from a state of psychotic fragmentation to one of operational and creative Flow—dictate the overcoming of classic dichotomies between *humanitas* and *téchne*. The effectiveness of the intervention does not reside in the mere automation of the task, but rather in the reconfiguration of the learning environment into a space of ethical-cognitive mediation. We are not facing a technology that "solves problems", but an innovation that elevates the condition of the subject.

Ontology of the Prosthesis: Beyond Mimesis, toward Elevation A first fundamental theoretical node, crucial for the definition of Algorithmic Empathy, concerns the functional distinction between the "mimetic perspective" and the "prosthetic perspective" in the use of Artificial Intelligence [15]. While the current technocratic tendency often pursues a mimesis of the human (AI that simulates emotions or conversations), risking the generation of relational surrogates, the present study has radically embraced the prosthetic and elevating perspective. The editing software was not introduced to "fake" a human relationship, but to act as a functional extension of higher faculties. Rejecting the delegation of decision-making to the machine—which would entail that ethical and cognitive "atrophy of choice" feared by contemporary philosophical critique [16]—the device was used as a structuring *auxilium*. In this sense, technology does not subtract agency (capacity to act) from the student, but on the contrary, enables and elevates it: it provides the logical-sequential scaffolding necessary so that the subject's intentionality can rise above the "background noise" of psychotic thought, allowing the exercise of those higher faculties (judgment, aesthetics, narrative) that the pathology tended to inhibit.

Phenomenology of Algorithmic Empathy: The Syntonic Feedback The innovative heart of the research lies in the redefinition of the concept of empathy within human-machine interaction. If human empathy requires an emotional resonance ("feeling with"), Algorithmic Empathy is configured as a structural syntony ("functioning with") that acts as a secure base for the exploration of the Self [17]. For the subject with a dual diagnosis (Schizophrenia and ODD), human interaction is intrinsically anxiety-provoking due to the Theory of Mind deficit that prevents a correct decoding of others' intentions. The algorithm, in its binary and deterministic nature, instead offers a "reclaimed" relational environment:

1. **Absence of Judgment:** The machine responds to the error with neutral operational feedback, disarming the defensive mechanisms of ODD and allowing the error to become a constructive rather than destructive moment.
2. **Predictability:** The software's response is constant and replicable, providing an anchorage of stability in a world perceived as chaotic.

In this "pedagogical space", the student experiences a reflected empathy: the machine acts as a non-distorting mirror that allows them to objectify their own internal experiences. By manipulating the clips on the Timeline, the subject performs an operation of mental hygiene, "cutting" the interferences and "editing" a coherent narrative, elevating themselves from a passive victim of the symptom to an active narrator of their own story.

The Hybrid Ecosystem and the Ars Boni et Aequi Model The conducted experience suggests an epistemological parallelism with the Roman legal tradition, specifically with the Celsian definition of law as *ars boni et aequi* [18]. Just as justice cannot be entrusted solely to the automatism of the norm (*dura lex*) but requires the intervention of the interpreter to guarantee equity in the concrete case, inclusive education requires a human direction that governs the power of the technical instrument. In our model, technology represents the *instrumentum*—rigorous, tireless, precise—while the educator embodies the *humanitas* capable of directing the technical action toward the well-being of the person. It is not a matter of replacing the educator with the algorithm, but of establishing a hybrid ecosystem:

- Algorithmic Empathy provides cognitive containment ("holding") and procedural security.
- Human Empathy provides meaning, warmth, and social recognition.

Only thanks to the ontological security provided by the machine (which neither betrays nor judges) could the student subsequently open up to relationships with peers.

CONCLUSIONS

The Innovation that Elevates and “Re-existence” Ultimately, the study demonstrates that true innovation does not lie in the sophistication of the software, but in the ability to use it to trigger processes of humanization. The adopted approach did not limit itself to compensating for a deficit (assistive logic), but aimed to liberate unexpressed potential (enabling logic). The short film **Il rumore del mondo** is not just a digital artifact, but an act of "re-existence": through technological mediation, the invisible subject made themselves visible, transforming the stigma of madness into a communicable diversity endowed with aesthetic value [19].

Algorithmic Empathy thus reveals itself not as an oxymoron, but as the condition of possibility for a new Digital Humanism.

In this perspective, technological innovation is not an end in itself, but becomes an instrument of spiritual and social elevation: it allows fragile humans to transcend their own fragmentation and to rediscover, in the ordered reflection of the screen, the intact dignity of their own face. Thus, technique returns to its original vocation of *therapéia*: not only care for the body, but a service of liberation for the soul.

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15. [16]Jonas, H. (2009). *Il principio responsabilità. Un'etica per la civiltà tecnologica*. Einaudi. [The critique of "technological delegation" is based on the risk that automatism deprives humans of the weight and dignity of ethical decision-making. In the educational context, this would translate into a passivizing didactics, opposed to the "enabling" one adopted in the case study.]
16. Bencivenga, G. M. (2025). *Alla ricerca di una possibile Empatia Algoritmica*, edito da "IURA AND LEGAL SYSTEM" Rivista giuridica UNISA, Volume 12-3 settembre 2025, p. 17. [Algorithmic Empathy is defined here not as a sentimental attribute of the machine, but as a "pedagogical space" of continuous exchange. In this setting, interaction with the cognitive artifact generates those "relational goods" (stability, predictability) essential for the restructuring of the Self in subjects with psychological fragility, in line with Seymour Papert's constructionism.]
17. Digesto, 1, 1, 1 (Ulpianus libro primo institutionum). [The famous reference to Celsus' definition – *ius est ars boni et aequi* – serves to reaffirm a structural similarity: just as in law equity necessarily requires human sensitivity ("feeling" the case), so in special education the machine can only provide instrumental support (instrumentum), while the teacher is responsible for the value-based direction of the intervention.]
18. Papert, S. (1993). *The children's machine: Rethinking school in the age of the computer*. BasicBooks. [See also J. Bruner, *La fabbrica delle storie*, Laterza, Bari 2002.]

Bencivenga emphasizes how digital pedagogy must overturn the paradigm of "learning to use" into a more empathetic "using to learn". This is the principle that guided the entire editing intervention with Marco, where technical learning was a vehicle for narrative reappropriation.]