

Eco-Reflective Framework in the Evolution of Critical Incident Technique (CIT) Between Digital Trajectories and Territorial Specificities

Antonella Nuzzaci ¹

¹ University of Messina; antonella.nuzzaci@unime.it

Abstract: This paper introduces the "Eco-Reflexive Framework", an integrated conceptual and operational architecture designed to evolve the Critical Incident Technique (CIT) into a dynamic, contextual, and emancipatory qualitative methodology. Grounded in a 20-year longitudinal research trajectory (2007–2026) spanning five successive empirical studies, the framework addresses the traditional limitations of retrospective CIT—such as recall bias, rigid categorical taxonomies, and a lack of ecosystemic integration—by systematically merging technological tools with highly complex territorial environments. Specifically applied to high-complexity schools and underserved educational ecosystems characterized by institutional marginality, geographical isolation, and multigrade classrooms, the framework is structured around three foundational pillars: Near-Real-Time Data Capture: This pillar utilizes e-portfolios, digital micro-logs, and e-pockets to capture incidents shortly after their occurrence, aligning with project-based learning and Design-Based Research (DBR) paradigms to transform data collection into an iterative, low-extraction-cost device. Action-Voice Explication: This pillar employs an action-verbalization protocol and explication interviewing to shift the subject's focus onto how an action concretely unfolded rather than retrospective theoretical justifications. Advanced Narrative Analysis: This pillar combines the Enhanced CIT (ECIT) approach with re-storying and cross-incident analysis to preserve temporal and biographical coherence while mapping recurrent patterns of vulnerability and resolution strategies across the territory. Methodological rigor and trustworthiness are systematically maintained through a dual-level assessment matrix (internal and external readings) and verified via precise evaluation metrics, including the Inter-Rater Coherence Index (Cohen's Kappa / Fleiss' K) and the Incidence Saturation Index, alongside stringent ethical protocols. Ultimately, the contemporary metamorphosis of CIT presented here positions it as a powerful epistemic and participatory device capable of making submerged, tacit educational practices visible and fostering transformative professional learning.

Keywords: Keywords: Critical Incident Technique (CIT); Eco-Reflexive Framework; Near-Real-Time Data Capture Cross-Incident Analysis

1. Introduction and epistemological evolution of CIT

In the context of the initial and continuous training of educational figures, critical reflection is constituted as a systematic and intentional form of evaluation of experience, aimed at overturning conventional explanations of reality and deconstructing those professional routines that often crystallize preconceived, sometimes dysfunctional, habits and beliefs in educational contexts.

The consolidated scientific debate highlights how the development of a

reflective competence — based on processes of conceptualization of reflection and its formative architectures (Calderhead, 1989; Calderhead & Gates, 1993) situated knowledge that arise from direct experience — represents a fundamental engine for the growth of the subject's skills (Boud, Keogh, & Walker, 1985; Mezirow, 1990; Nuzzaci, 2011a; Nuzzaci, 2012), offering a concrete answer to bridge the historical gap between abstract theoretical frameworks and the complex reality of everyday practices.

Adopting a constructively self-critical posture allows education professionals to inhabit the uncertainty, ambiguity and rapid changes that characterize contemporary training systems, stimulating the transition to a form of critical awareness and a profound transformation of one's professional identity. This process of transformation and critical examination of experiences has found a declination of strong relevance in the training models aimed at counselors and counselors (Furr & Carroll, 2003; Skovholt & McCarthy, 1988), also configuring itself as an elective tool for mapping and understanding the critical incidents related to multicultural dynamics (Coleman, 2006).

In this methodological scenario, the Critical Incident Technique (CIT, or ICT in Italian literature) has taken on a central role, experiencing a radical epistemological and operational metamorphosis. Originally developed in 1954 by John C. Flanagan within aeronautical-military programs, the technique was born with a markedly behaviorist system, aimed at isolating objectively observable human behaviors and mapping in dichotomous terms the behaviors that are effective or ineffective in determining the success or failure of a specific educational action (Flanagan, 1954). In this classical formulation, the incident assumed the qualification of "critical" and not "typical" only where the intentions of the act and its factual consequences were so defined as to leave no margin of doubt to the external observer.

The subsequent extension of CIT to the humanities and pedagogical research has radically redefined these assumptions. Through the transition towards constructivist (Schwartz & Holloway, 2024) and interpretative paradigms, the critical incident has been freed from the need to coincide with a dramatic or exceptional event, redefining its methodological boundaries (Butterfield et al., 2005; Butterfield et al., 2009). This evolution has benefited from the contribution of fundamental methodological pillars that have consolidated the use of the technique in a qualitative and descriptive-narrative key, highlighting its innovative heuristic scope in the exploration of subjective and organizational experiences (Chell, 2004; French, 1989; Woolsey, 1986). As underlined by the most recent interpretative models, the accident becomes critical not for its intrinsic or objective property, but by virtue of the meaning and heuristic value that the participant attributes to it exposed through the narration and verbalization of the action. It is configured as a common episode of professional life which, producing a moment of "rupture" or discard from routine expectations, forces the subject to stop and question his or her own deep assumptions, emotional experiences and the constraints of the context (Tripp, 1993).

In this sense, the fruitfulness of CIT as a catalyst for the development of

ty is widely reflected in international literature, in particular within the training courses of guidance counselors and counselors (Furr & Carroll, 2003; Skovholt & McCarthy, 1988) as well as in the analysis of students' experiences in multicultural training contexts (Coleman, 2006). Starting from this interpretative posture, the qualitative approach to CIT has been structured as a rigorous and flexible investigative device, capable of mapping the complexity of human practices through the richness of narrative accounts (Chell, 2004; French, 1989; Woolsey, 1986).

However, the literature highlights how the traditional application of CIT has come up against recurrent limitations, mainly related to the dependence on retrospective memory — which exposes data to distortions or idealized reconstructions (*recall bias*) — and to the tendency to fragment reports within rigid taxonomic and categorical grids, losing the holistic and dynamic richness of professional experience. Furthermore, research designs have often not adequately taken into account the interaction between the dynamics of the accident and the ecosystem in which it is generated, ignoring how geographical, institutional or socio-community variables redefine the actor's posture.

It is precisely in this void of literature that the need for methodological advancement capable of combining the systematic rigor of classical technique with the fluidity of modern training environments is inserted.

This paper aims to propose an integrated conceptual architecture, called *the Eco-Reflective Framework*, examining the evolution of the technique along two innovative trajectories; on the one hand, the expansion towards interdisciplinary and digitally mediated contexts (such as the use of e-portfolios and forms of *networked reflection*); on the other hand, the application located in territories of strong geographical specificity or marginality, with a particular focus on complex school contexts (Nuzzaci, 2026; Nuzzaci & Orecchio, 2023). Through this synthesis, CIT ceases to be configured as a mere linear procedure of *data collection* to evolve into a dynamic, ecological and participatory device, suitable for restoring voice and scientific visibility to submerged, tacit educational practices and contexts that have been analyzed for too long through rigidly decontextualized interpretative lenses.

2. Longitudinal mapping of research (2007-2026): methodological design, phases and structural limits

The reconceptualization of CIT within a transformative paradigm finds its empirical foundation in a longitudinal research trajectory developed over a time span of approximately twenty years (2007–2026). This extensive empirical research program, encompassing five successive empirical studies and a cumulative dataset exceeding 1,700 critical incidents, provides a robust and diverse evidence base. Such a significant longitudinal scope serves to validate the Eco-Reflective Framework, effectively bridging the historical gap between abstract theoretical constructs and the complex reality of situated professional practices. Chronologically, its origins can be traced back to the

professional identi-

REFLECT Project, an international initiative specifically oriented to the exploration and enhancement of reflective competence in training professionals (Chambers et al., 2007; Nuzzaci, 2009b; Nuzzaci, 2012). The architecture of this transnational cooperation has been nourished by the examination of significant learning episodes and critical conversations matured in international contexts (Chambers, 2003), integrating with methodological approaches related to action-research and discursive analysis of narratives (Colombo, 2003).

The overall design of the investigation was structured through a *multifocal assessment* plan aimed at examining the non-linear relationship between the theoretical-technical knowledge of the subjects and their situated educational practices, combining the qualitative collection of incidents with descriptive and parametric quantitative protocols in the final phases of analysis (Nuzzaci, 2011d; Mezirow, 1990). Specifically, correlational analyses were performed to investigate the relationship and strength of association between structural context variables (such as school complexity indices or geographic isolation) and the dimensions of reflective competence exhibited by the participants. From a procedural point of view, the research has integrated the technique of Flanagan (1954), with the structured reflection model of Christopher Johns (1991), inserting them within a semi-structured reflective cycle marked by a series of activities according to the model of Graham Gibbs (1988), mapping the localization of reflection through Moon's five-phase model (Moon, 1999) and establishing a deep connection between learning and storytelling (Alterio & Mc Drury, 2003). This approach engaged the participants to systematically pass through the phases of describing the event, analyzing their reactions, ethical-cognitive evaluation, elaboration of conclusions and planning of future action, exploiting the energy of the cognitive conflict generated by the examination of the contradictions between the reality of the action and the desirable practice and reconstructing the path of action.

The longitudinal research path was divided into four successive studies, each characterized by specific conditions of development and progressive advances on the methodological level:

- *Study I (2007)*: Involved 55 teachers and educators enrolled in a Master's Degree (Nuzzaci, 2011d; 2012).. In this initial phase, the main objective was to identify and classify descriptions of real cases of spontaneous reflective behavior to arrive at a characterization of the "dilemma of reflection" and to map the relationship between reflective practices and teaching (Nuzzaci, 2011b). The protocol involved the collection of incidents, the selection of the two most significant episodes for each subject, their treatment through reflection diaries and learning registers, and the subsequent analysis of the discourse structured on two levels: narrative (texts, autobiographies, transcripts) and meta-narrative (self-evaluations of facilitators and participants spaced out in time).

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ducted on two similar and *ad hoc* samples of 36 educators each, these studies investigated the correlation between reflective activity and the conditions of carrying out the training activity (in presence and at a distance), evaluating the impact of the technique on the quality of the *final project work* and on the collaboration processes (Nuzzaci, 2017). The results highlighted the recurrence of precise "common denominators" in the accidents selected by the participants; the episodes focused mainly on the great emotional tensions related to relational difficulties with students, colleagues and superiors, fitting into a perceived framework of growing job instability and project uncertainty. Precisely in the face of these critical issues, the trajectory of investigation aimed to deepen reflexivity in the pedagogy of design, focusing on the regulatory role exercised by professional routines (Nuzzaci, 2009a) and formalizing specific projects on reflective drawing practices (Nuzzaci, 2011c).

- *Study IV (Innovation Phase, 2018)*: It marked a methodological turning point by extending the application of CIT to a sample of 44 educators, mentors and digital learning designers working in interdisciplinary environments. This phase explored the adaptability of the technique to digital and hybrid learning contexts, integrating data collection with advanced tools such as *digital storytelling*, e-portfolios and asynchronous discussion platforms, formalizing the concept of "*networked reflection*".
- *Study V (Territorial Ecosystems and Schools, 2025-2026)*: It represents the culminating phase of methodological innovation and the conceptual landing place of the entire longitudinal itinerary, extending the application of CIT to contexts characterized by strong geographical-social specificity and institutional marginality. This study actively involved teachers working in highly complex school realities, organically integrating the mature digital affordances validated in Study IV with the peculiar needs of isolated territories. *High-complexity schools* or underserved educational ecosystems can be defined as institutions whose educational management does not follow linear trajectories, but is constantly perturbed and reconfigured by a dense network of interacting structural, environmental and socio-cultural variables (e.g. high dropout rates). The main objective was the activation of the *Eco-Reflective Framework*, aimed at bringing out and giving scientific visibility to educational practices and complex pedagogical dilemmas (such as the high variability of the socio-cultural characteristics of students, didactic management, geographical isolation, etc.) historically excluded from the theoretical frameworks. Through *near-real-time* capture protocols, verbalization of the action, advanced *re-storying* techniques and *cross-incident analysis*, Study V has demonstrated how CIT can evolve from a mere descriptive-behavioral tool to a participatory ecological device, capable of converting the disturbance of the local unexpected into a fundamental
- *Study II (2010) and Study III (2012)*: Con-

- resource for the co-construction of a reflective meta-competence and for the professional emancipation of subjects.

Despite the profound significance that emerged in terms of the restructuring of professional identity, the rigorous application of the protocol along the four phases has brought to light significant structural and procedural limitations. Firstly, the technique proved to be extremely operationally burdensome, particularly in the initial phase of collection, discarding and classification of macroscopic repertoires (which exceeded 1000 incidents during the REFLECT project alone), requiring very long sifting times to isolate episodes with significant realities and exclude mere daily routine reports. Secondly, the criticality of the mnemonic filter, a limitation widely discussed in the international literature on CIT (Nuzzaci, 2012; 2011d; Arvidsson et al., 2005; Steven, 2020), has emerged strongly: in the absence of direct observation in real time, primary data are inevitably mediated by the lenses of individual perceptions, personal prejudices and selective retention of the subjects, who sometimes struggle to recall the microsocial details of the event or tend to provide ex-post justifying interpretations of one's conduct. Finally, the pure qualitative categorical analysis of the texts (traditionally structured on the four macro-areas of *triggers*, beliefs, behaviors and results) appeared intrinsically insufficient if not accompanied by mixed interpretative approaches and solid theoretical models of reference, running the risk of reducing the complexity of the lived experience to a rigid and aseptic behavioral taxonomy. unable to grasp the dynamic nuances of professional change and transformation.

3. Methodological innovation: the eco-reflective framework between digital spaces and territorial specificities

To overcome the limits of aseptic categorization and mnemonic distortion that emerged in the trajectory of the previous research, the *Eco-Reflective Framework* was formalized here, an original conceptual model that redefines CIT in a dynamic and situated key. The proposed epistemological advance lies in the extension of the technique along two integrated systemic lines, concerning the technological ecosystem (Mena et al., 2024) and the territorial ecosystem, with a specific declination in the context of highly complex schools (Nuzzaci, 2026). The ecological approach is based on the assumption that the critical incident is not a decontextualized entity, but the product of the profound interactions between the subject, the mediation tools and the singular characteristics of the territory in which it operates. In the specific field of complex school realities, the didactic action is constantly reconfigured by structural variables (geographical location of the school, characteristics of the learners, etc.) and the extreme porosity of the relational boundaries between the school institution and the local community.

In these scenarios, the "criticality" of the event acquires a peculiar social value; The disruption of the teaching routine or the communication crisis are

events, but indicators of structural socio-educational tensions and constraints that reflect the marginality of isolated territories and educational ecosystems, historically analyzed through homogenizing theoretical and interpretative frameworks. This reading is part of the contributions aimed at redefining the epistemology of reflective practice in teaching contexts, highlighting the indissoluble link between the action of the professional and his or her situated knowledge (Van Manen, 1995).

The Eco-Reflective Framework responds to these challenges through the implementation of an innovative procedural structure articulated on three main axes:

1. *Multimodal and Near-Real-Time Data Capture*: in order to mitigate the error inherent in the *recall bias*, the model provides for the capture of the incident in a close time with respect to its occurrence. Through the use of e-portfolios, digital micro-logs and instant-vlogging applications (e-pockets), the professional can document the episode by collecting not only the written text, but also oral traces, visual elements and emotional nuances in the immediacy of the experience. The Critical Incident Technique ceases to be a mere diagnostic tool a posteriori and is transformed into an iterative investigation device, thus becoming the fundamental unit of analysis for re-designing (*reflexive design*) educational solutions in real time within highly complex ecosystems. This approach aligns with the paradigms of *project-based learning* (Nylén & Isomöttönen, 2017) and *design-based research* (Wang & Hannafin, 2005), for advanced technological environments, transforming harvesting into an interactive, multimodal and low-cost extraction process. The integration of these technologically advanced environments is anchored in expanded models of CIT oriented to explore the use of information and learning processes (Hughes, 2012), consolidating the value and significance of the technique within the methodologies of investigation for the social sciences and education (Kain, 2003).
2. *Action-Voice Explicitation*: The transition from the pre-reflective and lived experience to a conscious representation takes place through a protocol of "verbalisation de l'action" anchored to *the techniques of explicitation interviewing* (Urquhart, 2003; Blanchet & Gotman, 2000; Vermersch, 1994). The subject is thus guided to recall the concrete development of the action and the deep kinesthetic or emotional components connected to it, focusing on the "how" the conduct developed rather than on the theoretical justifications of the "why". The accident is thus removed from the dimension of the "objective" event to be translated into a personal and collective cognitive and interpretative resource.
3. *Advanced Narrative Analysis via Re-storying and Cross-Incident Analysis*: Overcoming the traditional reduction of texts to lists of coded fragments, the framework introduces the *Enhanced CIT* (ECIT)

almost never simple
individual unforeseen

approach (Butterfield et al., 2005; 2009), combining it with the *re-storying* methodology. Qualitative data, once collected and explained, are not simply placed in closed categories, but undergo a process of narrative recomposition aimed at preserving the temporal, biographical and interactional coherence of the professional history. The subsequent *cross-incident analysis* (Watkins, 2022) allows to dynamically map the recurrent patterns of vulnerability and the resolution strategies adopted by the teachers of the territory, favoring the emergence of a theory of practice located and validated by the community. In this key, the *Eco-Reflective Framework* does not limit itself to photographing the state of the art of the subjects' skills, but acts as a catalyst for professional growth and critical awareness. The fundamental innovation consists in transforming CIT from a mere technique of measurement or retrospective description to a generative, contextual and emancipatory methodology, capable of converting the constraint of the territorial context and the disturbance of the unexpected into privileged spaces for learning and professional emancipation.

4. Methodological Appendix: The Data Processing Protocol in the Eco-Reflective Framework

The implementation of the Eco-Reflective Framework requires the definition of a rigorous and standardized protocol for the processing, classification and modeling of qualitative and quantitative data deriving from the Critical Incident Technique. Given the potentially massive amount of textual and multimedia repertoires generated in the field (which in the longitudinal research trajectories described exceeded 1700 incidents collected), the data processing process is divided into five sequential and interconnected phases, aimed at ensuring the inspection of the logical chain of analysis and the reliability of the interpretations.

The logical-mathematical assumptions and epistemological repercussions that govern the application and integration of these control metrics within the research design are summarized in the following structural framework (Table 1).

Methodological dimension	Index / Metric Used	Threshold and Control Logic	Epistemological relapse / validity
Consistency of Qualitative Coding	Cohen / Fleiss coefficient κ	Optimal threshold: $\kappa > 0.70$ A lower index signals ambiguities in the thematic nodes (<i>Triggers/Beliefs</i>) and imposes an inter-judge arbitration session.	It guarantees the scientific objectivity of the categories. It demonstrates that the taxonomy is stable, clear, and transferable to independent researchers.
Standardization of Field Procedures	Protocol Loyalty Index	Percentage of facilitators' adherence to Gibbs and Johns' reflective cycle steps during the <i>Action-Voice</i> interview.	Minimizes the standard deviation of data collection. It avoids improvisation by facilitators, ensuring uniform activation of skills.
Combined System Function	<i>Qualitative and quantitative integration</i>	The indices do not quantify the experience (which remains biographical and contextual), but regulate the process of analysis.	It transforms the subjectivity of the researcher into a traceable, inspectable and scientifically transparent element .

Table 1. Regulatory logic and validation metrics in the Eco-Reflective Framework

Transcription and Constitution of the Multimodal Corpus

The primary CIT data, originating from oral narratives, learning logs, diaries and explication interviews, are initially collected through *near-real-time* digital tools. The audio tracks and video contributions are subjected to orthographic and *verbatim* transcription, including metalinguistic elements (significant pauses, hesitations, variations in tone), intended as profound indicators of emotional tension or reflective dilemmas not yet verbalized. The textual material flows into a centralized database, where each individual critical incident is indexed through descriptive metadata (demographic profile of the participant, school or territorial context, date of the event and type of support used).

Step 2: Selection, Filtering and Sieving Process

To overcome the heavy burden of waste and ensure the relevance of the corpus, the raw materials are subjected to a negotiation and sieving process based on strict inclusion and exclusion criteria. Each report is reviewed by a pool of independent facilitators and experts to verify that the incident validity requirements are met at the same time:

- *Inclusion*: The episode must describe a concrete and situated action (not an abstract opinion), clearly identifiable in its antecedents and consequences, and perceived by the subject as a moment of rupture or evolutionary turning point.
- *Exclusion*: Reports describing teaching routines, situations with no observable impact on educational outcomes, or stereotyped narratives not based on direct experiences are discarded.

Step 3: Inductive Coding and Advanced Interpretive Categorization

The corpus of validated incidents is imported into software for the analysis of qualitative data (NVivo) for the start of coding, respecting the criteria of *thematic analysis* and structuring of qualitative data (Boyatzis, 1998; Creswell, 2009). The treatment does not impose pre-existing theories, but adopts an inductive approach aimed at bringing out meanings directly from the texts. The units of analysis are broken down and mapped on four conceptual macro-categories originating from the literature and refined during empirical studies:

1. *Triggers*: Events, obstacles or unforeseen events of a didactic, communicative or territorial nature that activate the crisis of routine.
2. *Beliefs*: The value framework, implicit assumptions, prejudices and professional ideology of the subject put to the test by the accident.
3. *Behaviors (Actions)*: The concrete conducts, immediate decisions or lack of action implemented by the actors involved.
4. *The Results (Outcomes)*: The immediate consequences of the behavior, the partial or total resolution of the dilemma, and the emergence of new long-term educational needs.

Step 4: Triangulation, Cross-Check and Inter-Judge Agreement

To neutralize the risks of purely subjective or partial interpretations by the researcher, the categorization code is subjected to checks of reliability and internal consistency. A random sample of incidents (generally 10-15% of the

total) is independently coded by two or more external evaluators. Through the calculation of statistical indices of inter-judge agreement (such as Cohen's Kappa coefficient), discrepancies are quantified; Divergent coding nodes are discussed in facilitator-led arbitration sessions until a unanimous consensus is reached, thus ensuring the stability and transferability of the emerging taxonomy.

Phase 5: Synthesis, Narrative Re-narration and Output

The last phase of the treatment involves overcoming textual fragmentation through narrative recomposition (re-storying) and cross-incident analysis (Watkins et al., 2022). Given the substantial empirical weight of the dataset, this phase does not merely compile single case histories but cross-examines extensive empirical evidence to build reliable macro-patterns of practice. The data, isolated in the previous phases, are reassembled into 'meaning maps' and categorical reports that combine the qualitative depth of professional biographies with the rigorous quantitative reporting of frequencies and thematic co-occurrences. This dual treatment makes it possible to visualize the recursive patterns of vulnerability and educational success present in the ecosystem, translating the raw data into structured reports, useful for subsequent democratic restitution to participants (member checking) and for the modeling of targeted training courses.

5. Validity, credibility and guarantees of the method in the eco-reflective framework

The transition to an eco-reflective model requires the definition of rigorous validation protocols and evaluative views capable of preserving the scientific soundness of the Critical Incident Technique without sacrificing its heuristic flexibility. In the panorama of qualitative research, the concepts of validity and reliability are refounded around the criteria of "goodness" and "trustworthiness", excluding replicability in favor of the credibility and transparency of procedures (Lincoln & Guba, 1985; Schwandt, 1997). In this operational framework, the CIT is configured as a tool of proven utility for the conduct of rigorous qualitative investigations (FitzGerald et al., 2008), lending itself to precise conceptual modeling for the systematic analysis of accidents (Kirby, 2010).

To clarify the multidimensional interactions that govern this process and ensure the rigor of the proposed operational architecture, the dynamic relationships between the different layers of the framework have been formalized in an integrated structural model (see Figure 1).

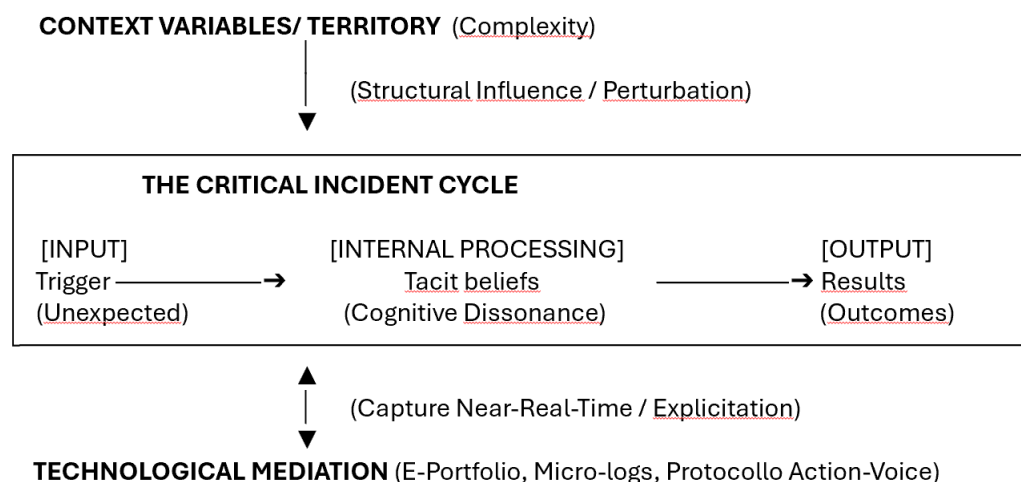


Figure 1. Systemic-structural model of the Eco-Reflective Framework. The diagram formalizes the breakdown of the critical incident according to the Input-Process-Output chain, highlighting the double regulatory constraint exercised by macro-territorial variables (high) and by multi-modal near-time (low) traceability technological devices

As illustrated in the structural diagram, the fundamental unit of analysis (the critical incident) is not isolated from the context, but is constantly perturbed by the macro-ecosystem variables of the territory.

To ensure the internal coherence of the entire empirical material produced and the adequacy of the interpretative procedures, the Eco-Reflective Framework adopts a double level of evaluation analysis, borrowed from the *assessment* practices of longitudinal projects on reflexivity:

- *Internal Evaluation (Internal Readings)*: It actively involves all the subjects included in the research context (teachers, educators, local actors), who participate in the co-construction and negotiation of the meaning of the incidents treated.
- *External Evaluation (External Readings)*: Entrusted to the research conductors/facilitators and to external independent evaluators, with the specific aim of verifying the conceptual validity of the critical-reflective model, the reliability of the data that emerged and the fidelity in the application of the protocols in the field.

This evaluation framework and the application of the related statistical indices (such as Cohen's Kappa or theoretical saturation) are based on the advanced operational protocols for the methodological use of CIT (Halcro & Roberts, 2024; Spencer-Oatey & Harsch, 2015). It systematically focuses on precise areas of control summarized in the following operational matrix.

Operational Matrix of Control Areas and Evaluation Indices			
Control Area	Criteria of Rigor and Methods of Implementation	Associated Valuation Indices	Methodological objective
Validity of the Incident	The episode described must be based on a real and circumscribed experience, providing rich analytical details relating to the contextual antecedent, the conduct implemented and the immediate or future outcomes.	Incidence Saturation Index: Ratio between the number of new topics that emerged and the total number of incidents collected (the analysis stops when the index tends to zero, indicating the theoretical saturation).	Exclude routine accounts or narratives that are abstract and lacking behavioral anchorage.
Reliability and Standardization	Use of carefully designed guidelines and stimuli; rigorous training of interviewers/facilitators to minimize spurious variations in data collection.	Protocol Fidelity Index: Percentage of facilitators' adherence to the phases of the reflective cycle (Gibbs/Johns) during the explicitness interviews.	Ensure consistency and transparency of <i>data collection procedures</i> .
Ecosystem credibility	Triangulation of sources (oral accounts, multimedia recordings, observations and context documents) and constant <i>member checking</i> with participants to confirm the accuracy of the transcriptions and interpretations.	Democratized Agreement Index (Member Checking): Percentage of cases in which teachers and local actors confirm the correspondence between the researcher's interpretation and the original meaning of the incident.	To provide an original, multidimensional and non-decontextualized representation of the phenomena explored.
Coding Traceability	Software-supported inductive categorization for qualitative analysis (QDA), calculation of inter-judge agreement on emerging categories (<i>triggers</i> , beliefs, behaviors, outcomes), and constant discussion of discrepancies.	Inter-Judge Coherence Index (Cohen's Kappa / Fleiss's K): Statistical coefficient used to quantify the degree of agreement between the two independent external evaluators in the classification of textual elements.	Openly document the logical chain that leads from raw data to theoretical models.

Table 2. *Operational matrix of methodological control devices in the Eco-Reflective Framework: structural articulation of the auditing areas, criteria of qualitative rigor, associated metric indices and related epistemological objectives for the validation of the technique*

A leading role within this scaffolding is played by *ethical practices*, which acquire a crucial relevance precisely by virtue of the direct and in-depth interaction provided for by the CIT, which entrusts researchers with strictly

experience of the subjects. Exploring problematic situations exposes participants to strong emotional strain and vulnerability, requiring strict adherence to the ethical practices of qualitative research.

The ethical guarantees of the framework therefore provide for the signing of informed consent, strictly voluntary adherence with the explicit right to interrupt the activity at any time, and the absolute guarantee of anonymity or pseudonymization of texts. In addition, participants are provided with a detailed and preventive explanation of the purposes of the study and the nature of their involvement, structuring moments dedicated to *debriefing* and transparent return of results. This approach is not configured as a mere bureaucratic fulfillment, but as an ontological and epistemological condition essential for founding a safe and welcoming narrative environment, indispensable for the critical incident to emerge as a real resource for learning and transformation.

5. Conclusions and future prospects

The theoretical and empirical path examined demonstrates that the Critical Incident Technique cannot be reduced to a mere linear tool for data collection, but is configured as a powerful epistemic device capable of making visible the submerged educational realities and of unhinged rigidly homogenizing visions of the school. Through the formalization of the Eco-Reflective Framework, CIT makes a paradigm leap, demonstrating an extraordinary methodological versatility in exploring the deep link between the narrative structure of professional reports and the application *performance* of subjects in the field.

The main goals of the proposed model lie in its ability to stimulate authentic reflexivity and to promote the construction of situated pedagogical theories, closely linked to the demands and specificities of marginal or isolated territorial contexts. The introduction of digital and multimodal dimensions within the reflective cycle (Gibbs, 1981; 1988) *has* made it possible to overcome the historical limit of retrospective *recall bias*, anchoring reflection to traces and memories close to the event and enhancing the processes of democratic sharing of knowledge within communities of practice.

Future trajectories of CIT research foresee a further expansion of the framework through a systematic hybridization with advanced qualitative analysis software. While the current implementation of NVivo was strictly limited to inductive coding and qualitative categorical sifting (Triggers, Beliefs, Behaviors, and Outcomes), future prospects lie in the advanced automation of multimodal workflows. This includes the direct analysis of raw audio and video tracks, as well as the extraction of complex co-occurrences across massive data clusters, without losing the interpretative and narrative anchorage of the texts. Ultimately, the contemporary metamorphosis of the Critical Incident Technique marks its definitive transition from a descriptive-behavioral approach to an interpretive, dynamic, and future-oriented paradigm, redefining the boundaries of qualitative research and offering the educational professions a privileged space for the co-construction of an emancipatory, flexible, and profoundly ecological knowledge.

confidential and biographical information on the professional

References

- Alterio, M., & Mc Drury, J. (2003). *Learning through storytelling in higher education*. London: Kogan Page.
- Arvidsson, B., & Fridlund, B. (2005). Factors influencing nurse supervisor competence: A critical incident analysis study. *Journal of Nursing Management*, 13(3), 231–237.
<https://doi.org/10.1111/j.1365-2834.2004.00532.x>
- Blanchet, A., & Gotman, A. (2000). *L'indagine e i suoi metodi: l'intervista* (F. G. Merlina & A. Nuzzaci, Trans. & Eds.). Roma: Kappa. (Original work published 1992).
- Boud, D., Keogh, M., & Walker, D. (1985). *Reflection: Turning experience into learning*. London: Kogan Page.
- Boyatzis, R. E. (1998). *Transforming qualitative information: Thematic analysis and code development*. Thousand Oaks, CA: Sage Publications.
- Butterfield, L. D., Borgen, W. A., Amundson, N. E., & Maglio, A.-S. T. (2005). Fifty years of the critical incident technique: 1954-2004 and beyond. *Qualitative Research*, 5(4), 475–497.
<https://doi.org/10.1177/1468794105056924>
- Butterfield, L. D., Borgen, W. A., Maglio, A.-S. T., & Amundson, N. E. (2009). Using the enhanced critical incident technique in counselling psychology research. *Canadian Journal of Counselling / Revue canadienne de counseling*, 43(4), 265–282.
- Calderhead, J. (1989). Insegnamento riflessivo e formazione degli insegnanti. *Insegnamento e Formazione degli Insegnanti*, 5(1), 43–51. [https://doi.org/10.1016/0742-051X\(89\)90018-8](https://doi.org/10.1016/0742-051X(89)90018-8)
- Calderhead, J., & Gates, P. (a cura di). (1993). *Concettualizzare la riflessione nello sviluppo dell'insegnante*. Londra: Falmer Press.
- Chambers, P., Clarke, B., Colombo, M., & Askland, L. (2003). Significant learning episodes and critical conversations in an international context: promoting reflexivity with students in service. *Review of Instruction in Service*, 29(1), 101-122.
- Chambers, P., Stroobants, H., Alexandrov, H., Clarke, B., Clarke, P., Consoli, F., Giannini, D., Janssens, A., Marchi, S., Mladenova, M., Munteanu, S., Nuzzaci, A., Sarbu, M., Sarcina, R., Tomassini, M., & Van Camp, T. (2007). *Advice on facilitating*. In H. Stroobants, P. Chambers, & B. Clarke (Eds.), *Reflective Journeys* (pp. 109-184). Leuven: Acco.

- Chell, E. (2004). Critical incident technique. In C. Cassell & G. Symon (Eds.), *Essential guide to qualitative methods in organizational research* (pp. 45-60). London: Sage.
- Coleman, M. N. (2006). Critical incidents in multicultural training: An examination of student experiences. *Journal of Multicultural Counseling and Development*, 34(3), 168-182. <https://doi.org/10.1002/j.2161-1912.2006.tb00036.x>
- Colombo, M. (2003). Reflexivity and narratives in action research: A discursive approach [Art. 9]. *Forum: Qualitative Social Research*, 4(2). <http://www.qualitative-research.net/index.php/fqs/article/view/718/1555>
- Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches* (3rd ed.). Thousand Oaks, CA: Sage Publications.
- FitzGerald, K., Seale, N. S., Kerins, C. A., & McElvaney, R. (2008). The critical incident technique: A useful tool for conducting qualitative research. *Journal of Dental Education*, 72(3), 299-304. <https://doi.org/10.1002/j.0022-0337.2008.72.3.tb04496.x>
- Flanagan, J. C. (1954). The critical incident technique. *Psychological Bulletin*, 51(4), 327-358. <https://doi.org/10.1037/h0061470>
- French, A. A. (1989). *Qualitative analysis in practice: The critical incident technique*. Cranfield: Cranfield Institute of Technology, Department of Social Policy.
- Furr, S. R., & Carroll, J. J. (2003). Critical incidents in student counselor development. *Journal of Counseling & Development*, 81(4), 483-489. <https://doi.org/10.1002/j.1556-6678.2003.tb00275.x>
- Gibbs, G. (1981). *Teaching students to learn: A student centred approach*. Oxford: Oxford University Press.
- Gibbs, G. (1988). *Learning by doing: A guide to teaching and learning methods*. Oxford: Further Education Unit, Oxford Polytechnic.
- Halcro, K., & Roberts, J. (2024). *How to use critical incident technique*. London: SAGE Publications Ltd. <http://dx.doi.org/10.4135/9781529684018>
- Hughes, H. (2012). An expanded critical incident approach for exploring information use and learning. *Library and Information Research*, 36(112), 72-95. <http://dx.doi.org/10.29173/lirg492>
- Johns, C. (1991). The Burford nursing development unit holistic model of nursing practice. *Journal of Advanced Nursing*, 16(9), 1090-1098. <https://doi.org/10.1111/j.1365-2648.1991.tb01824.x>

- Kain, D. L. (2003). Owning significance: The critical incident technique in research. In K. deMarrais & S. D. Lapan (Eds.), *Foundations for research: Methods of inquiry in education and the social sciences* (pp. 69–85). Mahwah, NJ: Lawrence Erlbaum Associates Publishers.
- Kirby, E. A. (2010). A conceptual model for critical incident analysis. *Journal of Critical Incident Analysis*, 1(1), 3-16.
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic Inquiry*. Beverly Hills, CA: SAGE Publications.
- Mena, J., Flores, M. A., Fernandes, E., & Estrada-Molina, O. (2024). Critical incidents as a strategy to enhance student teachers' reflection about practice through immersive learning. *Reflective Practice*, 25(3), 406–425. <https://doi.org/10.1080/14623943.2024.2321500>
- Mezirow, J. (1990). *Fostering critical reflection in adulthood*. San Francisco, CA: Jossey-Bass.
- Moon, J. A. (1999). *Reflection in learning and professional development: Theory and practice*. London: Kogan Page.
- Nuzzaci, A. (2009a). La riflessività nella pedagogia della progettazione: il ruolo delle routine. In N. Papparella (Ed.), *Il progetto educativo* (Vol. III, pp. 71-81). Roma: Armando.
- Nuzzaci, A. (2009b). Il Progetto LEONARDO REFLECT. Competenze riflessive e processi valutativi: per un'analisi dell'azione dentro l'azione. In G. Domenici & R. Semeraro (Eds.), *Le nuove sfide della ricerca didattica tra saperi, comunità sociali e culture* (pp. 35-51). Roma: Monolite.
- Nuzzaci, A. (2011a). *Competenze riflessive tra professionalità educative e insegnamento*. Lecce-Brescia: Pensa MultiMedia Editore s.r.l.
- Nuzzaci, A. (2011b). Pratiche riflessive, riflessività e insegnamento. *Studium Educationis*, 12(3), 9-27.
- Nuzzaci, A. (2011c). Three projects on the practices of reflexive design. In C. Day & C. Laneve (Eds.), *Analysis of educational practices* (pp. 229-234). Brescia: La Scuola.
- Nuzzaci, A. (2011d). Developing a reflective competence for a master's level programme on e-learning: The Leonardo Project Reflect. *International Journal of Digital Literacy and Digital Competence*, 2(4), 24-49. <https://doi.org/10.4018/jdlldc.2011100103>
- Nuzzaci, A. (2012). *Il Progetto REFLECT*. Lecce-Brescia: Pensa MultiMedia Editore.
- Nuzzaci, A. (2017). Applicazione e analisi della Tecnica dell'Incidente Critico in alcune pratiche di ricerca sulla riflessività: possibilità e limiti. In *TMRE, Formare alla ricerca empirica in educazione. Atti del Convegno Nazionale del Gruppo di Lavoro SIPED – Teorie e Metodi della Ricerca Empirica*

- in Educazione* (pp. 72-85). Bologna: AlmaMater – AMS ACTA.
<https://doi.org/10.6092/unibo%2Famsacta%2F5634>
- Nuzzaci, A. (2026). A Transformative and Dynamic Approach to Advancing Qualitative Research: The Critical Incident Technique (CIT). *Revista Brasileira de Educação do Campo*, 11, Article e20333.
- Nuzzaci, A., & Orecchio, F. (2023). The Critical Incident Technique (CIT): An evolving qualitative technique. *Formazione & Insegnamento*, 21(2), 136-145. https://doi.org/10.7346/-fei-XXI-02-23_17
- Nylén, A., & Isomöttönen, V. (2017). Exploring the critical incident technique to encourage reflection during project-based learning. In *Proceedings of the 17th Koli Calling International Conference on Computing Education Research* (pp. 88-97). New York, NY, USA: Association for Computing Machinery. <https://doi.org/10.1145/3141880.3141899>
- Schwandt, T. A. (1997). *Qualitative inquiry: A dictionary of terms*. Thousand Oaks, CA: SAGE Publications.
- Schwartz, H. L., & Holloway, E. L. (2024). *Essentials of constructivist critical incident technique*. Washington, DC: American Psychological Association. <http://dx.doi.org/10.1037/0000408-001>
- Skovholt, T. M., & McCarthy, P. R. (1988). Critical incidents: Catalysts for counselor development. *Journal of Counseling & Development*, 67(2), 69-72. <https://doi.org/10.1002/j.1556-6676.1988.tb02016.x>
- Spencer-Oatey, H., & Harsch, C. (2015). The critical incident technique. In *Research Methods in Intercultural Communication*. Hoboken, NJ: John Wiley & Sons, Inc.
<http://dx.doi.org/10.1002/9781119166283.ch15>
- Steven, A., Wilson, G., Turunen, H., Vizcaya-Moreno, M. F., Azimirad, M., Kakurel, J., Porras, J., Tella, S., Pérez-Cañaveras, R., Sasso, L., Aleo, G., Myhre, K., Ringstad, Ø., Sara-Aho, A., Scott, M., & Pearson, P. (2020). Critical incident techniques and reflection in nursing and health professions education: Systematic narrative review. *Nurse Educator*, 45(6), E57-E61.
<https://doi.org/10.1097/NNE.0000000000000796>
- Tripp, D. (1993). *Critical incidents in teaching: Developing professional judgement*. London: Routledge.
- Urquhart, C., Light, A., Thomas, R., Barker, A., Yeoman, A., Cooper, J., Armstrong, C., Fenton, R., Lonsdale, R., & Spink, S. (2003). Critical incident technique and explication interviewing in studies of information behavior. *Library & Information Science Research*, 25(1), 63-88.
[https://doi.org/10.1016/S0740-8188\(02\)00166-4](https://doi.org/10.1016/S0740-8188(02)00166-4)

-
- Van Manen, M. (1995). On the epistemology of reflective practice. *Teachers and Teaching: Theory and Practice*, 1(1), 33-50.
- Vermersch, P. (1994). *L'entretien d'explicitation*. Paris: ESF.
- Wang, F., Hannafin, M. J. (2005). Design-based research and technology-enhanced learning environments. *ETR&D*, 53, 5-23. <https://doi.org/10.1007/BF02504682>
- Watkins, K. E., Ellinger, A. D., Suh, B., Brenes-Dawsey, J. C., & Oliver, L. C. (2022). Further evolving the critical incident technique (CIT) by applying different contemporary approaches for analyzing qualitative data in CIT studies. *European Journal of Training and Development*, 46(7-8), 709-726. <https://doi.org/10.1108/EJTD-12-2021-0185>
- Woolsey, L. K. (1986). The critical incident technique: An innovative qualitative method of research. *Canadian Journal of Counselling*, 20(4), 242-254.

