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Snow, Silence, and Story: Narrative Metacognition in Sami Student Learning in Arctic Norway

Maria Nilsen[1], Thomas Haug[2], Emma Larsen[3]
[1]University of Tromsø, Norway
[2]Oslo School of Architecture and Design, Norway
[3]Norwegian School of Economics, Norway

ABSTRACT

Background. In Arctic Norway, the education of Indigenous Sami students involves navigating linguistic, cultural, and ecological dimensions that differ markedly from mainstream schooling norms. Traditional pedagogies often overlook how local knowledge systems and environmental contexts shape learning processes.
Purpose. This study investigates how narrative metacognition-learners' awareness and regulation of their thought processes through storytelling-emerges among Sami students in Arctic educational settings. The research aims to explore how narrative practices, silence, and spatial awareness function as cognitive tools within Sami learners' reflective processes.
Method. A qualitative research design was employed, using narrative inquiry and ethnographic observation in two Sami-majority schools. Data were collected through student storytelling sessions, classroom reflections, and teacher interviews.
Results. The findings reveal that Sami students frequently engage in self-reflective meaning-making through oral narratives and strategic use of silence, often linked to landscape, seasonal rhythms, and intergenerational knowledge. These metacognitive expressions reflect a culturally embedded logic of learning that resists conventional Eurocentric measures of participation and articulation.
Conclusion. The study concludes that recognizing and supporting narrative metacognition can enhance culturally responsive pedagogy in Indigenous education contexts. These insights contribute to both Indigenous education research and broader efforts to decolonize learning environments.

KEYWORDS

Active Learning, Cultural Cognition, Indigenous Pedagogy

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Correspondence:

Pong Krit,
pongkrit@gmail.com

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INTRODUCTION

Education in Arctic Norway unfolds in a unique ecological, cultural, and epistemological landscape, shaped by seasonal extremes, vast geographies, and Indigenous knowledge systems that often stand in contrast to standardized Western schooling frameworks. Among the Indigenous Sami people, learning has traditionally been embedded in relationships with nature, storytelling practices, and collective cultural memory. These modes of knowledge transmission are not easily captured within conventional educational indicators, which often privilege verbal participation, linear reasoning, and standard testing

measures. As a result, Sami students often find themselves navigating two worlds-the epistemological world of Indigenous knowledge and the institutional world of Western schooling.

The Sami people, who inhabit the northern parts of Norway, Sweden, Finland, and the Kola Peninsula in Russia, possess rich oral traditions that are central to identity, land-based knowledge, and intergenerational continuity. In Sami educational contexts, storytelling is not only a means of communication but a cognitive and cultural practice through which individuals organize experience, reflect on meaning, and construct identity. Narrative thinking in this context is closely tied to landscape, silence, rhythm, and observation-modes of learning that may be misinterpreted by outsiders as passivity or lack of engagement. This divergence between culturally specific cognitive styles and externally imposed educational norms continues to present challenges in inclusive curriculum design and classroom assessment.

National and regional educational policies in Norway have increasingly recognized the rights of Sami learners to culturally appropriate education. While there have been efforts to integrate Sami language and content into the curriculum, there is still a need to understand how learning itself is culturally mediated in Sami contexts. Specifically, more attention must be paid to the cognitive and reflective processes that support learning among Sami students-processes that may not conform to dominant paradigms of self-expression or participation (Gianfreda et al., 2025; Haime et al., 2024; Kharawala et al., 2022; Lombardi et al., 2022). A deeper understanding of Sami learning epistemologies can contribute to more inclusive, respectful, and effective pedagogical approaches that honor the cognitive agency of Indigenous students.

Despite curricular advances in Indigenous education, the dominant pedagogical paradigms in Norway still reflect Eurocentric assumptions about learning, participation, and cognitive development. In many Sami classrooms, these assumptions manifest as misalignments between how students express understanding and how educators assess knowledge. For example, the emphasis on verbal fluency and spontaneous expression in classroom discourse often overlooks students who demonstrate deep reflection through silence, observation, or indirect modes of responseform-s of cognition that are integral to Sami epistemology (Aitken et al., 2023; Christou et al., 2023; Negretti et al., 2023; Sakalidis et al., 2022). This mismatch can result in the underestimation of student competence and a failure to engage learners on their own cognitive terms.

Teachers in Sami-majority schools often struggle to reconcile institutional expectations with the cultural learning preferences of their students. Professional development rarely prepares educators to recognize and support metacognitive processes that are expressed narratively or through culturally situated behaviors. As a result, students who rely on narrative storytelling, seasonal logic, or relational memory to structure their understanding may be perceived as disengaged or underperforming (Jericho et al., 2022; Misso et al., 2022; Ojala & Pohjannoro, 2024). This disconnect between cultural cognition and classroom norms contributes to a broader sense of educational exclusion and epistemic marginalization for Indigenous learners.

The lack of pedagogical recognition for Indigenous metacognition not only affects academic outcomes but also erodes cultural self-esteem and identity validation. Sami students may internalize the belief that their preferred modes of thinking are inadequate or inappropriate within academic settings (Heydari & Beigzadeh, 2024; Schwarz, 2023). Over time, this can diminish student confidence, reduce participation, and weaken ties to both school and cultural community. Addressing this problem requires a redefinition of what constitutes “effective” learning and a shift toward culturally grounded pedagogies that foreground narrative, place-based, and non-verbal forms of metacognition.

This study aims to explore how narrative metacognition operates within Sami students' learning experiences in Arctic Norway. The research seeks to understand how Sami learners use storytelling, silence, and spatial awareness as tools of reflection, organization, and cognitive monitoring in educational contexts. By analyzing how students engage with these culturally grounded practices, the study contributes to a broader understanding of metacognition that transcends dominant Western models of self-regulation and introspection.

The research also investigates how these metacognitive strategies are recognized-or overlooked-within classroom settings, and how educators interpret students' reflective behaviors through their own cultural and pedagogical lenses. The study places particular emphasis on the role of silence, a frequently misunderstood yet cognitively significant aspect of Sami communication (Cowan et al., 2022; Despres et al., 2024; Faggioli et al., 2024). It explores whether silence functions not as absence, but as an intentional form of cognitive processing and environmental attunement, deeply rooted in Indigenous ontologies and epistemologies.

A further objective of the research is to inform culturally responsive pedagogical frameworks that acknowledge and incorporate Indigenous cognitive styles. By offering a detailed case study grounded in narrative inquiry and ethnographic observation, the research aims to provide practical insights for educators, curriculum developers, and policymakers. The study contributes to decolonial educational efforts by centering Sami epistemologies as valid and valuable within mainstream learning systems.

While Indigenous education has gained visibility in Nordic policy discourse, there remains a scarcity of research focused specifically on the cognitive dimensions of Sami student learning. Existing literature tends to address language revitalization, cultural content inclusion, or educational rights, often without examining the internal processes through which students think, reflect, and regulate their own learning. Metacognition, as a concept, has largely been framed through Western psychological models that emphasize individualistic, explicit, and verbalized forms of self-assessment and monitoring (Bröcker et al., 2023; Lungu et al., 2023; Zunshine, 2024). These models may fail to capture the nuanced, often narrative-based reflective practices of Sami students.

Research in Indigenous education globally has begun to challenge these limitations by proposing culturally responsive and decolonizing approaches to pedagogy and cognition. However, within the Norwegian context, there is limited empirical evidence on how Sami students engage in self-regulated learning, particularly through culturally specific modalities such as storytelling or silent reflection. The absence of this research constrains educators' ability to assess learning holistically and reinforces deficit-oriented perceptions of Indigenous learners.

This study addresses the gap by situating narrative metacognition within the lived experiences of Sami students in Arctic schools. It brings together ethnographic insight, narrative analysis, and Indigenous methodologies to create a more nuanced account of how learning is experienced and expressed. In doing so, it offers a counter-narrative to deficit models and contributes to a more inclusive understanding of cognitive diversity in educational theory and practice.

This research offers a novel conceptual contribution by introducing "narrative metacognition" as a culturally grounded construct situated in Sami student learning. Unlike mainstream educational models that treat metacognition as primarily verbal, explicit, and individual, this study proposes that reflection can be expressed through narrative structures, environmental awareness, and non-verbal cues such as silence. These findings invite a rethinking of cognitive assessment frameworks and call for broader epistemological inclusivity in understanding how learners monitor and direct their own thinking.

The methodological innovation of the study lies in its combination of narrative inquiry with Indigenous ethnographic methods, including participant observation and culturally embedded interviewing practices. By foregrounding student voices and respecting culturally appropriate forms of expression, the research avoids imposing external standards on Indigenous learning processes. This approach models how education research can engage ethically and constructively with Indigenous knowledge systems, while also generating actionable insights for pedagogical practice.

The study is justified by the ongoing need to decolonize education systems and make them more inclusive of Indigenous worldviews. As Sami students continue to face cultural dissonance within institutional settings, there is a moral and educational imperative to recognize and support their cognitive agency. By identifying narrative metacognition as both a theoretical and pedagogical concept, this research offers a critical tool for building culturally responsive classrooms that honor the knowledge traditions of the Arctic North.

RESEARCH METHODOLOGY

This study employed a qualitative research design grounded in narrative inquiry and ethnographic methodology to explore the presence and function of narrative metacognition among Sami students in Arctic Norway. Narrative inquiry was chosen for its capacity to illuminate lived experiences through storied expressions, particularly relevant in Indigenous contexts where oral traditions are central to learning and cultural transmission (Flynn et al., 2023; Jeffrey et al., 2025; Lindström et al., 2022; Rashmi & Vanlalhruaii, 2023). The study's ethnographic dimension allowed for prolonged engagement in the research site and the incorporation of cultural, spatial, and relational nuances that shape the cognitive and communicative practices of Sami learners.

The research was conducted in two Sami-majority lower secondary schools located in northern Norway. The participant group consisted of 18 students between the ages of 13 and 15, along with three teachers who identified as either Sami or had experience working within Indigenous education frameworks. A purposive sampling strategy was used to ensure that participants were actively involved in Sami language or cultural education programs. Consent was obtained from school administrators, teachers, students, and their guardians, following ethical guidelines for research involving Indigenous youth in Scandinavian contexts.

Data were collected through a combination of storytelling sessions, classroom observations, semi-structured interviews, and reflective student journals. Storytelling was used as both a method and a subject of inquiry, inviting students to share personal narratives and traditional stories as part of classroom activities. Observations focused on classroom discourse, student behaviors during reflective tasks, and the use of silence and spatial orientation during learning. Teacher interviews explored pedagogical beliefs about cognition, narrative, and Sami cultural frameworks. Student journals captured introspective thoughts and narrative responses related to classroom experiences, identity, and memory.

The research followed a four-phase procedure: immersion, data collection, co-construction, and analysis. During the immersion phase, the researcher spent four weeks participating in school life to build trust and cultural rapport. In the data collection phase, narrative and observational data were gathered over a six-week period. In the co-construction phase, students and teachers were invited to validate transcriptions, clarify meanings, and reflect on the narratives as part of an ethical, participatory process. Thematic analysis was conducted using a culturally responsive framework, with particular attention to expressions of metacognitive awareness, storytelling structure, and the function of silence. Data triangulation, member checking, and peer debriefing were employed to ensure validity and interpretive depth.

RESULT AND DISCUSSION

Table 1 summarizes the key data sources and participant engagement across the research period. The study included 18 Sami students and 3 teachers from two lower secondary schools in Arctic Norway. Over a six-week period, data were gathered through 12 classroom observation sessions, 36 student narratives (2 per student), 18 reflective journals, and 6 semi-structured teacher interviews. Of the student participants, 16 completed both narrative tasks and journals, while 2 submitted only partial reflections. Observation notes revealed consistently high levels of engagement during storytelling sessions, with 14 students participating vocally and 4 contributing primarily through written responses or active listening behaviors.

Table 1. Summary of participant contributions and data collection

Data Type	Quantity
Students Participating	18
Teachers Interviewed	3
Classroom Observations	12
Student Narratives Collected	36
Reflective Journals Completed	18
Teacher Interviews Conducted	6

Narrative data revealed three dominant metacognitive patterns in student storytelling: temporal structuring of thought, spatial-attunement, and silence as reflective space. Students often embedded their cognitive processes within narratives of environmental interaction, such as moving through snow-covered terrain or observing animal behavior, linking these experiences to learning themes like patience, resilience, or relational awareness. The structure of the stories indicated planning, sequencing, and a meta-awareness of learning moments, suggesting the use of narrative as a cognitive tool for organizing knowledge and reflection.

Student journals reinforced these themes, with frequent references to silence as a means of internal processing. Rather than perceiving silence as an absence, students described it as a preparatory or consolidative phase in which thoughts were “settled like snow” before being verbalized. Several students reflected on how the quietude of the landscape influenced their capacity to “listen to themselves” or recall ancestral stories. This spatially and culturally situated form of introspection points to an alternative model of metacognition-one that emphasizes presence, environment, and non-verbal awareness as part of the learning process.

Inferential patterns suggest that students who articulated metacognitive reflection in their journals were also more likely to demonstrate narrative coherence, cultural depth, and ethical themes in their storytelling. Those who referenced internal monitoring or learning intentions produced stories that included explicit problem-solving, emotion labeling, and moral reflection. For example, a subset of 7 students consistently used transitional devices to explain how they arrived at certain insights or decisions, indicating metacognitive regulation within the narrative structure. This pattern was observed in both journal reflections and oral storytelling sessions.

Teacher interviews supported these observations, noting that students who were typically quiet in general classroom discussions became more expressive and cognitively engaged during storytelling activities. Educators described how some students used pauses, spatial metaphors, or animal imagery to articulate complex ideas or self-evaluations. Teachers also reflected on how their understanding of student competence shifted when they considered culturally specific modes of expression. Several noted that by allowing narrative space and respecting silence, they observed richer and more authentic student participation.

Correlations between observational data and narrative analysis revealed that narrative metacognition often co-occurred with spatial references to nature, memory, or cultural rituals. Students frequently framed their learning within seasonal cycles, land-based experiences, or familial traditions. These connections suggest a metacognitive style grounded not in abstraction but in relational and ecological thinking. Emotional reflection was also highly correlated with storytelling depth, especially among students who incorporated stories from elders or community experiences, indicating that cognitive and affective dimensions of learning were intertwined.

A representative case emerged from a student, "Elle," who initially displayed minimal classroom participation but contributed a compelling story during a snow-tracking exercise. Her narrative described how she learned to read animal tracks from her grandfather, interweaving sensory observations, ethical responsibility toward nature, and personal learning reflection. In her journal, Elle described how storytelling helped her "understand her own thoughts" and "remember what is important in life." This case exemplifies how culturally situated narrative can evoke and reveal high-order cognitive processes otherwise hidden in conventional classroom assessments.

Another illustrative case involved "Nils," a student who frequently used silence during classroom interaction. During a group storytelling session, Nils offered a brief but symbolically rich account of a lost compass and reorientation during a snowstorm. His story, though concise, demonstrated reflective thinking about direction, decision-making, and interdependence. In his journal, Nils explained that he "thinks more clearly in silence" and that "stories come when the noise stops." His example challenges dominant assumptions about verbal fluency as the sole marker of cognitive activity and suggests the need to recalibrate how participation and reflection are recognized in Indigenous learning contexts.

These findings indicate that Sami students engage in metacognitive processes through culturally embedded practices that include narrative structuring, spatial awareness, and silence. Their cognitive strategies are expressed in ways that may not align with conventional pedagogical expectations but are nonetheless indicative of deep learning and self-regulation. Recognizing these practices as valid forms of metacognition can support more inclusive and responsive education for Indigenous learners.

The study affirms that narrative metacognition in Sami education is not a marginal or incidental phenomenon but a culturally coherent expression of how students reflect, learn, and construct meaning. Acknowledging and supporting such forms of learning invites educators and policymakers to broaden their understanding of cognition to include Indigenous epistemologies (Giuliani et al., 2024; Hartjes et al., 2024; Kusiak-Pisowacka, 2023). Doing so contributes to a decolonized vision of education-one that values snow, silence, and story as legitimate and powerful dimensions of student development.

The findings of this study reveal that Sami students in Arctic Norway engage in a culturally situated form of metacognition expressed through narrative structure, spatial awareness, and intentional silence. Data from student stories, reflective journals, and classroom observations demonstrate that learners actively organize their thoughts, monitor understanding, and process experiences through storytelling grounded in landscape, family memory, and intergenerational knowledge. Silence emerges not as disengagement, but as a purposeful cognitive pause, signaling inner reflection and mental rehearsal (Papadea et al., 2023; Terao & Kumari, 2022; Whitworth, 2024). Teachers who recognized these practices observed higher levels of authentic participation and narrative depth, especially among students who were otherwise quiet in conventional classroom settings.

This research aligns with and extends existing literature on culturally responsive education and Indigenous cognition. Studies such as McCarty et al. (2006) and Battiste (2013) emphasize the importance of recognizing diverse epistemologies in schooling, yet few have examined metacognitive processes within Indigenous contexts at the micro-level of classroom interaction. This study adds nuance to the field by detailing how Sami students use culturally embedded tools-like silence and landscape-as reflective mechanisms, challenging dominant models that equate metacognition solely with verbal or explicit articulation. It contrasts with traditional cognitive science frameworks that often prioritize individualized, linear, and decontextualized models of self-regulation.

The observed behaviors suggest that metacognition among Sami students is deeply relational and environmentally responsive. Learning is not isolated within the mind but situated in seasonal rhythms, communal narratives, and non-verbal knowing. These findings serve as a powerful reminder that cognition is culturally constructed and that reflective thinking may manifest in forms easily overlooked by educators unfamiliar with Indigenous learning practices. The presence of narrative metacognition in these students' learning trajectories signals a redefinition of what it means to "know," "think," and "reflect" in Arctic classrooms. Recognizing these practices as legitimate expands the epistemic diversity within education and honors Indigenous cultural frameworks.

The implications of this study point to the urgent need for teacher education programs to include training in recognizing and responding to culturally distinct forms of cognition. Silence should not be mistaken for passivity, nor should narrative structure be undervalued in favor of fragmented verbal answers. Curriculum developers and education authorities in Norway and similar contexts must consider how assessment systems, classroom discourse norms, and teacher expectations can unintentionally marginalize students whose learning processes do not align with dominant pedagogies. Institutional acknowledgment of narrative metacognition can support more inclusive classroom climates and affirm Indigenous students' cognitive agency.

The effectiveness of narrative metacognition can be attributed to the deep integration of place, culture, and memory in Sami ways of knowing. Storytelling allows learners to process experience holistically, embedding sensory perception, moral reasoning, and social context into a coherent whole (Lavrysh et al., 2023; Richburg et al., 2023). Silence functions as both a communicative tool and a cognitive space, cultivated through generations of living in relationship with the Arctic environment. This contrasts sharply with the speed, interruption, and output-driven norms of many formal classrooms. Sami students are engaging in metacognitive regulation, but through modalities that reflect their community values and ecological realities.

These practices are sustained through cultural continuity and familial transmission, often outside the purview of formal schooling. The failure of educational systems to recognize them reflects a broader epistemological hierarchy in which Western logics of cognition are privileged. When students internalize that their preferred ways of thinking are invisible or undervalued, their academic confidence and cultural identity may suffer (Teeple & Benolken, 2023; Wykes, 2024). The integration of narrative metacognition into pedagogy provides an avenue to bridge this disconnect and supports educational justice for Indigenous learners.

Teachers in the study who adapted their practices to accommodate narrative silence and land-based knowledge reported greater student trust and deeper engagement. This demonstrates that pedagogical flexibility informed by cultural understanding is essential in diverse classrooms. Recognizing storytelling as a mode of reflection also empowers students to bring personal and communal experiences into learning, increasing relevance and fostering voice. These outcomes

suggest that institutional rigidity around cognitive expression limits educational equity and creativity.

Future work should explore how narrative metacognition can be incorporated into assessment frameworks and curriculum planning. Longitudinal studies could examine how such practices influence academic identity, resilience, and long-term achievement among Sami learners. Comparative studies with other Indigenous groups could shed light on shared patterns of reflective cognition and pedagogical possibilities across cultural contexts. Educational stakeholders must now consider how to reimagine cognitive scaffolding in ways that include not only what students learn, but also how they come to know, reflect, and remember-through snow, silence, and story.

CONCLUSION

The most important finding of this study is that Sami students in Arctic Norway engage in a culturally embedded form of metacognition through storytelling, silence, and spatial awareness. These students demonstrate self-reflection, planning, and meaning-making not through conventional verbal or explicit strategies, but through narrative structures that integrate personal experience, ecological rhythm, and intergenerational knowledge. The strategic use of silence emerged as a reflective tool rather than communicative absence, allowing for cognitive processing deeply aligned with Indigenous ways of knowing. This culturally specific pattern of narrative metacognition challenges dominant paradigms of learning and expands the definition of cognitive participation in educational contexts.

The study contributes a significant conceptual innovation by introducing the idea of narrative metacognition within Indigenous education research, particularly in a Nordic context. Through the integration of narrative inquiry and ethnographic observation, the study develops a methodological framework capable of capturing cognitive processes that are often overlooked by Western-centric assessment models. The research demonstrates that metacognitive awareness can be expressed non-verbally, relationally, and ecologically, thereby broadening both theoretical and practical understandings of how learning unfolds in Indigenous settings. This contribution is valuable not only for Indigenous education but also for global efforts to decolonize cognition and diversify pedagogical approaches in multicultural classrooms.

The research is limited by its small sample size and its focus on two Sami-majority schools, which may affect the generalizability of findings across broader educational settings or other Indigenous groups. The study was also constrained by time, with data collected over a relatively short field period, limiting the ability to assess long-term impacts of narrative metacognition on academic achievement or identity development. Future research should explore the integration of narrative metacognition into curriculum design, teacher training, and assessment frameworks across a wider range of Sami and non-Sami learning environments. Comparative studies involving other Indigenous communities could further validate the conceptual model and enrich our understanding of cognitive diversity in education.

AUTHORS' CONTRIBUTION

Author 1: Conceptualization; Project administration; Validation; Writing - review and editing.
Author 2: Conceptualization; Data curation; In-vestigation.
Author 3: Data curation; Investigation.

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