Proceedings of the 7th Conference on AI Music Creativity (AIMC 2026), Berlin, Germany, September 16th-18th

Advancing Mediated Musicianship in Computational Co-Creativity

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Abstract

Within the context of a newly established Digital Composition unit, students investigated existing sound design methodologies and proposed extended compositional techniques grounded in digital audio production and new instrument design. Rather than creating sound-based artefacts alone, they produced substantial 1500-word reflective statements with annotations and references. These writings served as the foundation for iterative software design in computational creativity and led to Particle Sound Mapper, an interactive audiovisual instrument that maps three-dimensional particle trajectories and geometric visualisations to sonic parameters in real time. This paper asks how student reflective writing can function as a design brief for a co-creative instrument. Treating the submitted statements in that way, the project produced Particle Sound Mapper and used the process to examine mediated musicianship as a pedagogical and technical practice rather than as a finished product alone.

1 INTRODUCTION

The ability to envision and express ideas, emotions, and experiences through both tangible and intangible mediums of musical expression is a fundamental aspect of human artistry. The rise of artificial intelligence has introduced a profound technological shift, transforming the creative process from a crafting aid to a crafting generator, and with it, raising immediate and urgent concerns about the potential erosion of human uniqueness, individual voice, and cultural grounding. AI-generated music, operating through statistical inference over large, predominantly commercial databases, draws on existing bodies of work to feed its algorithms, producing outputs that are technically coherent yet frequently lacking the embodied friction and creative specificity that trained listeners recognise as essential to compelling artistic expression.

The contemporary music landscape is characterised by hyper-reproduction. Generative AI compresses the traditional compositional workflow: ideation, sketching, iterative refinement, and realisation, into near-instantaneous prompting. This produces millions of tracks daily, raising urgent questions about authorship, emotional resonance, and the fundamental value of musical creativity when output exceeds our capacity for quality listening and musical appreciation. The "Generative Turn" reconfigures not only creative agency and aesthetic decision-making but also the perceptual and political infrastructures that determine what becomes audible in a saturated digital culture. My own perspective is shaped by decades of practice at the intersection of electroacoustic music and the dynamic relationship between sound and visuals through computer-assisted-composition.

As a composer and digital media designer, and Senior Lecturer in Composition and Music Technology at the Sydney Conservatorium of Music, I have integrated emerging technologies as a means of preserving the uniqueness of human artistic expression and musical intent. Systems such as 3D Composer, developed during my PhD, were designed to externalise abstract musical thought through multi-dimensional geometric mappings, linking visual form directly to sonic output in ways that augment human intention. Large generative models tend to homogenise output, prioritising statistical plausibility over transformative and aesthetic novelty. It is precisely this tendency that requires a critical understanding, a curious mind, and a culturally aware response to technological innovation.

Herewith, I propose computational co-creativity as a relational pathway forward: a means of exploring creative horizons and expanding human potential as AI becomes omnipresent in the musical realm. Rather than simply following the conventions of generative tools, this approach calls for the willingness to take risks, to experiment, and to maintain awareness of the processes that shape our sonic futures. Computational co-creativity integrates the computational agent as a dynamic partner in an ongoing dialogue, capable of introducing surprise, responding to a nuanced human input, and participating in iterative negotiation, rather than as an autonomous generator (robot-like) that redistributes the creative actions without accountability, context and artistic awareness. The contribution is therefore threefold: a documented teaching method that treats extended reflection as a design specification; a prototype instrument derived from that specification; and a qualitative account of how those writings informed the software instrument's features.

2 COMPUTATIONAL CO-CREATIVITY

This paper examines how such co-creative systems can be shaped by student reflective practice to foster genuine innovation and mediated musicianship. This discussion stems from a recent pedagogical project within the Digital Composition unit at the Sydney Conservatorium of Music where students were asked to investigate existing sound design methodologies and to propose extended compositional techniques in digital audio production and new instrument design. Most importantly in this context, rather than expecting purely sound artefacts, they produced substantial 1500-word reflective statements accompanied by diagrams, annotations and references.

These documents were the starting point of the generative content itself and became the direct foundation for iterative software development in computational creativity. These statements were read as design briefs rather than as assessment essays: recurring proposals (gating as form, stem-to-preset extraction, non-audio data as wavetable source, gesture-to-timbre mapping, and spatially narrative installation) were extracted by close reading and then implemented as named modules. AI-assisted coding was used to draft mappings, preset logic, and prompt-to-parameter routines from those briefs; architecture, parameter ranges, and musical behaviour were selected and revised by the author. No large generative model produced the music itself.

The primary outcome is Particle Sound Mapper, an interactive audiovisual instrument that maps three-dimensional particle trajectories and geometric visualisations to real-time sonic and musical parameters. The instrument incorporates over 13 procedural presets, including DNA helices, galaxies, and tesseracts; and more than 40 geometric forms. It features a polyphonic FM/additive synthesis engine, particle-triggered audio events, spatial effects processing, generative rhythm sequencing, and real-time recording functionality. Particle positions govern immersive sound fields and dynamic acoustic ecologies, while visual attributes: trajectory curvature, cluster density, rotational speed map directly to timbral evolution, modulation parameters, and rhythmic structures.

Visual intuition and auditory outcomes exist in continuous reciprocal interactive dialogue: particle movements and geometric transformations drive the synthesis engine, while sonic decisions dynamically reshape visual behaviours, generating musical structures from distributed human-machine agency. This design extends the trajectory established in 3D Composer and resonates strongly with Curtis Roads' seminal *Point Line Cloud* (2005). Roads describes how sensations of point, pulse, line, and surface emerge as the density of microsound particles increases; sparse emissions produce rhythmic traces, rapid cloning induces pitch continuity, and dense agglomerations form evolving sound clouds. Particle Sound Mapper advances this microsound aesthetic into a unified, real-time, interactive environment where performers and composers can directly navigate and manipulate these particle-based sound gestures.

Aligned with the AIMC 2026 theme "The Generative Turn: Mediated Musicianship in a Hyper-reproductive Age," this project contributes to ongoing conversations around instrument-human relations, distributed creative agency, and innovative pedagogy in post-generative contexts. By integrating students as active collective designers whose original reflective writings directly inform tool development in quasi-real-time, the initiative encourages new generations of digital creators to engage with hyper-reproduction not as passive recipients, but as architects and designers of innovative processes that reshape visual dynamics into novel musical structures.
This paper examines computational co-creativity in the generative turn, and provides a structured overview of student visions for new musical instruments, with a focus on new compositions, and new directions in music with direct quotes and analysis exploring how these visions were implemented in Particle Sound Mapper. We also address the broader pedagogical implications for mediated musicianship.

Computational co-creativity denotes interactive systems in which human and artificial agents contribute reciprocally to a shared artefact through real-time or near-real-time feedback. Generative models are effective at exploring patterns within learned spaces, but they are limited when the task is to alter the conceptual space itself rather than produce variations inside it. Understanding the architecture of these technologies makes their constraints and unexplored possibilities accessible to creators. In the current hyper-reproductive regime, large-scale models converge on tendencies found in training data. Creative form then arises less from embodied gesture or musical intent than from predictive pattern, and agency is redistributed across humans, models, platforms, and listeners in generic rather than musically informed ways. The blurring of style that AI accelerates raises the question of what artistic expression is worth when musical practice is averaged rather than transmitted and transformed.

Co-creative systems offer more promising and engaged solutions both aesthetically and creatively. They mitigate blending and fusion by introducing new combinatorial elements or moments of uncertainty that foster creativity and innovation. Rather than offering standard packs, plug-ins, or preset black boxes, these evolving programming tools may favour a continuous dialogue between human intention and computational solutions, bringing the creative process closer to the notion of *techne*, a more genuine exploratory search for innovation integrating aesthetic and creative direction.

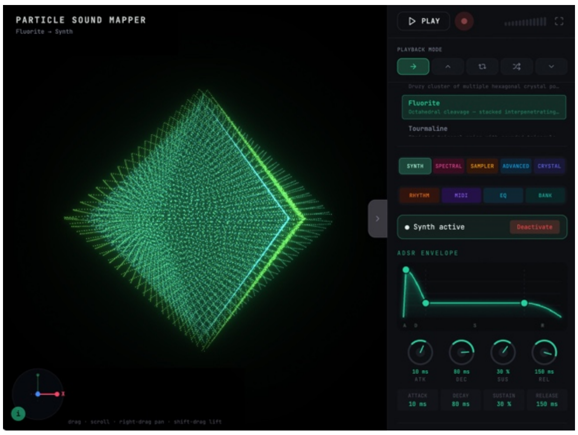

Figure 1: Particle Sound Mapper user interface.

Particle Sound Mapper was explicitly designed to embody these co-creative principles. Student reflective statements, which critically examined sound design methodologies and proposed extensions, became the generative seed for this new instrument's architecture. Particle movements, clusters and geometric transformations actively drive synthesis, while sonic choices reshape visual dynamics in real time (Figure 1). This reciprocity yields emergent musical structures ranging from sparse pointillist events to dense textural clouds. Distributed human-machine agency yields opportunities for making it interactively and pedagogically accessible and useful for contemporary teaching/learning environment. Text prompts such as a requested groove or texture are parsed into existing synthesis and sequencing parameters (density, filter motion, gate pattern, spatial spread); the mapping is rule-based and curated, not an unconstrained generative model.

The student proposals that emerged from this process provided rich content enabling co-creativity in practice. They revealed encouraging patterns and behaviours. Students proposed new instruments and compositions as extensions of human agency rather than replacements for it, using AI or procedural tools to enhance curiosity, efficiency, and expressivity while maintaining a critical perspective. Their reflections position technology as a mediator that redistributes rather than removes creative tasks. A creative process is adopted, integrating mediated musicianship through AI and distributed agency in the hyper-reproductive age. Within this new context, students highlighted the importance of emphasizing personal expression and identity through sound.

3 STRUCTURED OVERVIEW OF STUDENT VISIONS FOR NEW MUSICAL INSTRUMENTS, COMPOSITIONS, AND DIRECTIONS IN MUSIC

A structured examination of the student reflective statements reveals a coherent and forward-looking collective vision for new musical instruments, new compositional techniques, and new directions in music. Students consistently envisage instruments as responsive, personalised, and creative partners rather than autonomous generators. They see compositions as processes of negotiation, reflection, and emergence rather than linear production. And they imagine new directions in music as hybrid, critically aware practices that navigate hyper-reproduction through curiosity, embodiment, and performance specificity. The following overview is organised by written proposals, with direct quotations and analysis that illustrate both the individual thinking and the broader collective trajectory.

3.1 Pattern-Morphological Gating (PMG): From Effect to Higher-Level Compositional Framework

One student proposes Pattern-Morphological Gating (PMG) as "an extended compositional technique" that treats rhythmic gating "not just as an effect but as a time-domain partitioning strategy that cuts audio into voiced and unvoiced segments, and a morphological articulation tool, shaping how textures enter, sustain and decay in relation to the beat to set the groundwork for an extended compositional tool." Drawing on Leo Murray's characterisation of sound design as "a practice where technological affordances, aesthetic intentions and listening behaviours mutually inform each other," the student envisions a VST plugin with "multiple preset patterns and modulation options" alongside an AI prompt tool that analyses "the project's tempo, groove and density to propose or adapt patterns."

The conceptual ambition here is significant. As the student states, "the key conceptual shift is to treat trance/pattern gating not just as an effect but as a higher-level compositional framework for digital audio." Each step in the pattern can modulate filter, panning, or effects, creating "coupled patterns of bright vs dark, narrow vs wide, or clean vs saturated textures that map onto the amplitude pattern, forming higher-order motifs in timbre space." Genre-categorised presets spanning trance, UKG, Detroit House, and cinematic styles—serve as "starting points for listening experiments, not as fixed end-states," preserving the essential role of attentive human listening and stylistic judgment. This vision positions the new instrument as a listening-centred compositional interface: one where the creator can "write down their perceived thoughts and ideas, into a system where it replicates and turns it into your individualised pattern/gate of choice."
PMG exemplifies mediated musicianship in its most considered form. The AI assists, but the human remains the architect of morphological gesture—countering hyper-reproduction not through resistance to technology but through the foregrounding of personal stylistic vocabulary and attentive sonic perception.

3.2 AI Sonic Character Extraction (AutoExtract): Efficient Reverse-Engineering for New Virtual Instruments

Another student proposes AI Sonic Character Extraction (AutoExtract) as "an extended compositional technique that automates the reverse engineering of sonic elements from existing commercial tracks. Using Logic Pro capabilities and AI-assisted analysis plugins, the process isolates individual stems, automatically analyses their timbral, dynamic, and spatial characteristics to then generate ready-to-use Logic channel-strip settings (.cst files) with minimal user intervention." The student reflects thoughtfully on the ethical and aesthetic dimensions of this automation: "This does not reject Farnell's core ideas. It still draws on principles of timbre, dynamics and space but shifts the heavy analytical and reconstruction labour to AI. In doing so, it frees the producer to direct their focus where it matters most… I can engage in detailed procedural design when it best serves the music or quickly generate a library of strong sounds and concentrate on originality, experimentation and emotion."

The envisioned outcome is a library of "drag-and-drop" virtual instruments carrying "the DNA of professional productions but remaining fully original when repurposed in new works"—a formulation that speaks directly to the question of how musical lineage can be extended rather than simply consumed. This direction in music prioritises efficiency without compromising its foundational principles, allowing composers to "switch focus on command" between detailed procedural design and higher-level musical and emotional expression. In the hyper-reproductive age, AutoExtract offers a practical and critically grounded response: rapid creation of personalised sonic palettes that support distributed agency while honouring Andy Farnell's emphasis on procedural audio and causality.

3.3 Data-Bending Wavetable Synthesis: Creative Abuse of Non-Audio Data for Novel Instruments

Another student proposes data-bending as "a form of sonic creative abuse and the sonification of non-audio data" that "pokes gaps within the boundaries between discrete forms of media." The approach involves importing raw hexadecimal ECU tuning maps or CAD data into a wavetable synthesiser, so that "forcefully importing these diagnostic and structural files into a wavetable synth would make the files' numerical engineering data translate the code into a massive and complex sequence of single-cycle audio waveforms." LFO modulation and subtractive filtering then "carve away harsh and aliased high frequencies" to yield playable instruments including, in the student's own project, "a hardstyle kick… using ECU mapping for tuning sports cars."

The conceptual proposition is radically open and aesthetically provocative: "creating instruments and sounds through digital mediums may not need the reliance of imitating physical instruments or the recording of acoustic spaces, but rather only requiring digital files that can be interpreted in sonical means." New compositional directions emerge from this "misinterpretation via wavetable synthesis," producing sounds with uncanny mechanical-organic qualities that bridge industrial and artistic domains. This directly addresses the challenge of hyper-reproduction by reclaiming non-musical data as creative material and fostering novelty through deliberate, critically aware technological misuse—a willingness to experiment rather than simply follow convention that is essential to the preservation of artistic distinctiveness.

3.4 AI-Augmented Granular Expressive Instruments and Gestural FM Synthesis (GFS): Gesture-Driven Performance Tools

Students propose AI-augmented granular instruments that map "gestures such as key pressure, modulation wheel, or MPE data to granular behaviours that resemble instrumental techniques like tremolo, vibrato, or sustained bowing." AI analyses real performances to extract envelopes that shape grain density and micro-timbral fluctuation, so that "a single held note can unfold into a variety of articulations," turning the instrument into a responsive partner rather than a static sample trigger.

Similarly, Gestural FM Synthesis maps "continuous performer gesture to the FM operator network," with pressure modulating modulation index, velocity influencing carrier-modulator ratio, and lateral displacement controlling feedback. The student's argument is precise and compelling: "FM operator parameters should function as primary expressive parameters, controllable in real time through continuous performer gesture," transforming FM from a pre-compositional design tool into "a dynamic compositional instrument" alive to the nuance of human physical expression.

These visions position new instruments as extensions of embodied performance enabling new compositional directions where timbre becomes a live, gestural counterpoint to melody and harmony. In the generative turn, they emphasise mediated musicianship through tight human-AI coupling that preserves agency, expressivity, and the irreplaceable dimension of physical human presence.

3.5 Immersive Fashion-Sound Installations and Hyper-Compressed Noise Rap: New Compositional and Aesthetic Directions

One student envisages an immersive audiovisual installation blending EBM's "industrial, authoritative aesthetic," Brian Eno's reflective compositional process, and designer Luke Reuben's visual language in "The Cavalier" collection. Field recordings of garment textures combine with synthesised "essences"—metallic blood drips, battle echoes and Gregorian chant modes to create narrative sound worlds that "characterise physical presence" and elicit embodied emotional responses. More specifically, the student reflects, "the true artistic experience comes from connecting the audience, performer and sound as one fluid experience that literally encapsulates and stimulates the human bodies." This vision of immersive, body-centred artistry resonates with the broader proposition of collective artistry as a means of preserving human uniqueness in the age of generative automation.

Another student proposes hyper-compressed Noise Rap as "the next logical step in the internet zeitgeist," pushing underground rap further into "hypercompressed, distorted walls of noise" by integrating noise and plunderphonics principles. Here, the contextual diagnosis is acute: "accessibility of making, releasing, consuming and discussing music has vastly oversaturated the very process of listening," leading artists to satisfy "the demand for constant stimulation in modern audiences" through extreme loudness and trained-ear aesthetics. Rather than lamenting this condition, the student proposes inhabiting and extending it as a critically self-aware artistic strategy. Collectively, these proposals expand compositional directions toward embodied, narrative, and aesthetically provocative practices that reclaim human agency within hyper-reproduction by emphasising physicality, aesthetic and social commentary, and the irreducible specificity of individual creative vision. Students envisage new instruments as personalised, interactive, responsive and technologically anchored partners. New compositions emerge as reflective negotiations rather than linear products, and new directions in music arise as hybrid, critically aware practices that integrate computational tools to amplify curiosity, embodiment, and musical depth rather than replace human intention and invention. These visions directly informed Particle Sound Mapper, turning individual reflections into a collective tool that supports exactly these directions.

4 REALISATION IN PARTICLE SOUND MAPPER: FROM STUDENT REFLECTIONS TO COLLECTIVE TOOL

The student proposals did not remain abstract ideas. They were translated directly into the software architecture and affordances of Particle Sound Mapper, creating a tangible synthesis of collective reflection and technical implementation. This section details how each major student vision shaped specific features of the instrument, illustrating the iterative, co-creative process that turned individual reflective writing into a unified, music-focused computational system.

4.1 Integration of PMG (Pattern-Morphological Gating)

The detailed reflection on gating as a morphological articulation tool directly inspired the generative rhythm sequencing engine. Particle Sound Mapper's rhythm module treats gating patterns as structural layers rather than simple on/off effects. Each step in a procedural preset can modulate amplitude alongside filter cutoff, panning, or effect sends exactly as the student described: "each pattern step potentially modulating the filter, panning, with the inclusion of effect sends or even sample selection."

An AI-assisted prompt interface analyses current particle density and rotational speed to suggest or adapt patterns in real time, mirroring the student's vision of a tool that "analyses the project's tempo, groove and density to propose or adapt patterns." In practice, a user can enter a textual description such as "syncopated 3-against-4 with swelling attacks in a cinematic style," and the system generates a corresponding morphological pattern that couples volume gates with spectral brightening, producing the "higher-order motifs in timbre space" the student envisaged. This transforms static pads or drones into articulated rhythmic fields and realises the student's call for gating to function as "a higher-level compositional framework for digital audio."

4.2 Integration of AutoExtract (AI Sonic Character Extraction)

One student's workflow for stem isolation and AI-assisted channel-strip generation influenced the preset-saving and library-building mechanics. Particle Sound Mapper allows users to capture a current sonic state—derived from any particle configuration as a reusable preset with a single command. An automated analysis layer extracts timbral, dynamic, and spatial parameters from the current particle-driven sound and stores them for instant recall, realising the "drag-and-drop" virtual instrument library the student described. Composers can build personalised sonic libraries that carry "the DNA of professional productions but remain fully original when repurposed." In classroom testing, students assembled libraries from reference tracks and fed those libraries back into particle mappings, creating seamless and generative cycles between extraction and creative repurposing.

4.3 Integration of Data-Bending Wavetable Synthesis

The student's proposal for importing raw hexadecimal ECU maps or CAD data inspired a dedicated "data-seed" import module. Users can drag any non-audio file into the system; Particle Sound Mapper interprets the binary data as single-cycle waveforms that populate the wavetable engine. LFO modulation sweeps through frames as the student experimented—"creating a linear sweep of individual frames of the file"—while subtractive filtering and phase-squeezing algorithms refine the resulting material into playable instruments. The reflection that "misinterpretation via wavetable synthesis can be established as a foundation for creating unique sounds" is now a core procedural pathway in the instrument, producing timbres with uncanny mechanical-organic qualities that students describe as bridging industrial and artistic domains.

4.4 Integration of AI-Augmented Granular Expressive Instruments and Gestural FM Synthesis

The granular and gestural proposals shaped the real-time mapping layer. The modulation matrix supports gesture-to-parameter mappings where key pressure controls grain density or modulation index, the modulation wheel influences pitch scatter or carrier-modulator ratio, and MPE data drives spatial diffusion or operator feedback. The vision of a held note unfolding "like a violin string under a bow" is realised through AI-extracted envelopes that shape grain behaviours or FM spectral evolution, allowing a performer to thicken a granular cloud or brighten an FM spectrum through increasing physical pressure alone. These mappings turn Particle Sound Mapper into a responsive performance partner that preserves human agency while amplifying expressive range.

4.5 Integration of Immersive Fashion-Sound Installations and Hyper-Compressed Noise Rap

The fashion-sound proposal influenced spatial audio and narrative layering tools. Particle positions drive immersive sound fields that respond to garment-like textures or narrative cues, while generative rhythm sequencing can produce hyper-compressed, distorted patterns inspired by the Noise Rap vision. Students have used the system to prototype installations where particle clusters mimic jingling beads or fabric movement, generating the embodied, narrative sound worlds the student envisaged "connecting the audience, performer and sound as one fluid experience that literally encapsulates and stimulates the human bodies."

Through these integrations, the overarching application Particle Sound Mapper became more than a single instrument. It became a true collective realisation of student thinking, a tangible demonstration of how reflective, curiosity-driven practice can shape critically informed technology. The bidirectional visual-auditory feedback loop ensures that the virtual instrument itself continues and extends the co-creative dialogue, inviting new users to explore the sonic dimensions of the original visions in unforeseen creative territories.

5 PEDAGOGICAL IMPLICATIONS FOR MEDIATED MUSICIANSHIP

The pedagogical implications of this project extend far beyond the creation of a single instrument. By treating 1500-word reflective statements as generative content, the Digital Composition unit models a new approach to teaching mediated musicianship in the hyper-reproductive age, one that integrates generative technologies without surrendering critical depth, musical awareness, or the irreplaceable dimension of individual human experience. Students learn not only technical skills but how to negotiate with computational systems as critical, reflective partners. This section examines the deeper pedagogical outcomes, drawing on student reflections and classroom observations to illustrate how the approach fosters curiosity, agency, technological proficiency and sustainable creative practice.

First, the requirement to produce extended reflective statements before any coding or sound design work shifted the focus from product to process. Students repeatedly described this as transformative. One noted that "documenting how different gating patterns and modulation routings affect perception of groove, timbre and form" forced them to articulate a coherent compositional philosophy before touching software. Another wrote that the reflection "frees the producer to direct their focus where it matters most"—echoing the insight at the heart of AutoExtract. This emphasis on reflection as generative content teaches students that critical thinking is not an afterthought but the very seed of innovation: an essential counter to the compression of hyper-reproductive workflows that threatens to render the creative process invisible. The essays differed from conventional project reports because they had to specify a technique, its listening rationale, and a plausible instrument behaviour before any sound or code existed; that constraint encouraged the students to reflect and take a compositional approach rather than reverse-engineer existing computational tools or compositional methods.

Second, the project cultivated distributed agency as a lived experience. Students saw their ideas directly shape Particle Sound Mapper's features, creating a tangible sense of ownership and authorship that is frequently absent in encounters with black-box generative tools. The student who proposed data-bending later commented that seeing their ECU-map experiments become a core import module "made the instrument feel like a continuation of my own thinking rather than a separate tool." In classroom critiques, students discussed authorship in nuanced and sophisticated terms, acknowledging AI and procedural contributions while asserting their role as the final curators of aesthetic and technological decisions.

Third, the approach embedded musical and ethical awareness as a natural dimension of technical practice. Reflections consistently referenced specific intellectual sources – Murray on listening behaviours, Farnell on causality, Roads on microsound and connected technical decisions to broader artistic questions. The fashion-sound student explored EBM's body-centric aesthetics and the uncanny valley in relation to Luke Reuben's designs, producing sounds that deliberately challenge perception. The Noise Rap student examined loudness wars and trained-ear aesthetics in underground internet music, proposing hyper-compression as a response to over saturation. These reflections ensured that Particle Sound Mapper's mappings remained critically informed, avoiding the aesthetic flattening often associated with generative tools, and demonstrating that it is essential to understand the architecture of emerging technologies to preserve the uniqueness of forging an individual musical voice through technological artistry.

Fourth, the project developed practical skills in co-creative iteration. Students learned to move fluidly between reflection, proposal, testing, and refinement—exactly the skills needed for mediated musicianship in an AI-mediated landscape. One student who proposed Gestural FM later used the instrument's mapping matrix to prototype live performance interfaces, noting that the process "transformed FM from a static design tool into a real-time timbral counterpoint voice." Another used the granular features to create expressive instruments that responded to MPE controllers, realising their vision of a held note unfolding with organic, expressive articulation.

Finally, the project counters the risks of hyper-reproduction by emphasising curiosity as a sustainable creative force pushing the boundaries of imagination further than standard commercially available music software. Students described the experience from description to making as calling for intrinsic curiosity and motivation to go beyond settling for existing tools but build new extensions and ways of thinking about sound. The data-bending student found joy in "misinterpretation" of non-musical files; the PMG student discovered pleasure in "listening-centred exploration of patterns"; the AutoExtract student gained the freedom to focus on "originality, experimentation and emotion." By structuring the unit around reflective writing as generative content, the project demonstrates that a willingness to take risks and experiment—rather than simply following the conventions of available tools can produce creative systems that sustain long-term engagement rather than leading to burnout or homogenisation.

In the broader AIMC 2026 context, these pedagogical implications suggest a viable model for tertiary music education that integrates generative technologies without compromising critical depth. This paper does not include a formal study of usability or learning outcomes. The discussion of agency, curiosity, and technological awareness is drawn from the students' reflective statements and from the instrument features those statements informed. Future iterations could expand this model to include interdisciplinary collaborations, open-source extensions, or longitudinal studies of how students apply these skills in professional settings, ultimately demonstrating how collaborative practice and computational co-creativity may alleviate new challenges during generative turns through mediated musicianship in a hyper-reproductive age.

6 CONCLUSION

Student reflective practice, used as a design brief and carried into AI-assisted software development, produced Particle Sound Mapper as one working example of computational co-creativity in the generative turn. In that process, students proposed and saw realised directions ranging from morphological gating and AI-assisted feature extraction to data-bending, gestural expression, immersive installation, and hyper-compressed Noise Rap. The project contributes a documented teaching method, a prototype instrument, and a qualitative account of how those writings informed its features, rather than a formal evaluation of learning or usability. By bringing those reflections into a unified audiovisual environment that extends 3D Composer and Roads' microsound aesthetics, the work offers emerging creators a way to stay inside the making of the tool, not only the prompt. In an era of hyper-reproduction, such collaborative and co-creative approaches keep music artistically resonant and sonically alive as a human activity.

AUTHOR DECLARATIONS

I certify that the intellectual content of this paper and associated projects is the product of my own work in collaboration with students enrolled in Digital Music Composition, a tertiary education unit of study at Sydney Conservatorium of Music – The University of Sydney Quoted student material is used with written consent from the students concerned. Identifying details are withheld unless attribution was requested. AI was intentionally used for the creation of associated software applications and prototypes part of this educational project. AI assistance was used to draft code and preset logic from the student briefs; analysis of the writings and all musical and software coding and design decisions remain the author's responsibility.

ACKNOWLEDGEMENTS

I thank the students in Digital Music Composition 5 (CMPN3235) at Sydney Conservatorium of Music, whose reflective statements informed Particle Sound Mapper: Alexander Benson (Pattern-Morphological Gating), Josh Davey (Hyper-Compressed Noise Rap), Stanley Christie-Spear (AI Sonic Character Extraction), Ari Guan (Data-Bending Wavetable Synthesis), Kahya Gursel (AI-Augmented Granular Expressive Instruments), Patrick Molony (Gestural FM Synthesis), and Jeremy Smith (Immersive Fashion-Sound Installation).

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