ACCSCIENCE PUBLISHING

Arts & Communication

ARTICLE

Designing short-format project-based learning for co-curricular ensemble rehearsal in higher music education

Eugene Seow*

School of Contemporary Music, Faculty of Performing Arts, LASALLE College of the Arts, University of the Arts Singapore, Singapore

Abstract

Ensemble rehearsal is inherently collaborative and performance-oriented, but these characteristics do not necessarily make rehearsal project-based. This article examines how project-based learning (PBL) can be operationalized within short, performance-linked co-curricular ensemble rehearsal in higher music education. It presents a practice-led analysis of the pedagogical design of Ensemble Groove Labs developed within a contemporary vocal and instrumental ensemble at a Singapore university. Rather than evaluating student outcomes, the analysis examines how established PBL principles were translated into rehearsal structures under the practical constraints of limited contact time, mixed musical backgrounds, and an existing performance calendar. The design combines an explicit musical inquiry problem, recurrent rehearsal loops, distributed student leadership, lightweight planning artifacts, critique and revision, reflection, and audience-facing performance. The analysis highlights a distinction between rehearsal that is merely active or collaborative and rehearsal deliberately structured around project-based inquiry. It further shows how lightweight scaffolds can externalize musical decisions sufficiently to support collaborative testing and revision without converting co-curricular rehearsal into a paperwork-intensive academic module. The article offers a bounded design account rather than evidence of causal learning effects or a validated intervention. It contributes a rehearsal-specific approach to adapting established PBL principles to the temporal, organizational, and artistic constraints of co-curricular higher music education.

Keywords: Project-based learning; Higher music education; Ensemble rehearsal; Co-curricular learning; Collaborative learning; Contemporary music

***Corresponding author:**
Eugene Seow
(info@eugeneseowmusic.com)

Citation: Seow E. Designing short-format project-based learning for co-curricular ensemble rehearsal in higher music education. *Arts & Communication*.
doi: 10.36922/AC026390080

Received: September 26, 2026

Revised: October 3, 2026

Accepted: October 12, 2026

Published online: October 20, 2026

Copyright: © 2026 Author(s). This is an Open-Access article distributed under the terms of the Creative Commons Attribution Noncommercial License, permitting all non-commercial use,distribution, and reproduction in any medium, provided the original work is properly cited.

Publisher's Note: AccScience Publishing remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

1. Introduction

Technically proficient musicians do not necessarily enter ensemble settings with an equally developed capacity for collective musical coordination. A player may execute an individual part accurately while still struggling to judge how that part functions within a changing ensemble texture: whether a register masks another instrument, whether a rhythmic choice supports or destabilizes the shared groove, whether a transition requires an explicit cue, or whether adding material strengthens or weakens the musical result. Such problems are relational rather than exclusively technical. They require musicians

to listen across parts, diagnose an ensemble-level problem, make context-sensitive decisions, and adjust those decisions as the performance develops. Ensemble rehearsal therefore provides a potentially rich environment for learning through collaborative musical problem-solving.

Project-based learning (PBL) offers one framework for organizing such activity. Rather than defining a project simply by the production of a final artifact or performance, established PBL models emphasize a challenging or authentic problem, sustained inquiry, learner voice and choice, reflection, critique and revision, and a publicly shared product.[1] Research in post-secondary and higher education similarly associates PBL with forms of active inquiry in which learners address complex problems through iterative and collaborative work.[2-4] Ensemble rehearsal appears readily compatible with these principles: musicians work toward performances, solve practical problems, negotiate with peers, receive feedback, and revise their work over time. Yet these similarities do not mean that ensemble rehearsal is inherently project-based.

The distinction is particularly important in higher music education. Collaborative music-making can remain substantially tutor-directed even when students are physically active and working toward an authentic performance. Students may execute solutions proposed by an ensemble director without participating materially in diagnosing the musical problem, comparing alternatives, determining rehearsal priorities, or deciding how a subsequent performance should be revised. Conversely, collaborative and peer-oriented approaches to music learning demonstrate the pedagogical potential of distributing greater responsibility for musical decision-making among learners.[5,6] The design problem becomes especially salient in the co-curricular setting examined here, where inquiry had to fit limited rehearsal time, heterogeneous musical backgrounds, variable participation, and an existing performance calendar rather than the extended timetable and assessment structures of a credit-bearing course. The relevant question is therefore not whether ensemble rehearsal resembles a project, but how recognizable PBL principles can be deliberately operationalized within these constraints.

The pedagogical setting examined here developed from the Intentional Pocket Project, a previously published jazz-informed workshop intervention concerned with groove and ensemble fluency in a university ensemble.[7] That earlier study documented the workshop design, its framework of Specific Listening, Technical Awareness, and Macro-Sight, and participant responses concerning timing, role clarity, group cohesion, and related aspects of ensemble performance. The present article addresses a different analytical problem. It neither reanalyzes those participant data nor advances the earlier outcome claims. Instead, it examines how the subsequent Groove Lab design organized rehearsal activity through PBL principles: framing musical coordination as an inquiry problem, distributing responsibility for rehearsal decisions, externalizing selected decisions through lightweight planning tools, and embedding critique and revision within performance preparation. This distinction also preserves Intentional Pocket as the established pedagogical framework rather than presenting it as a new construct in the present article.

The article argues that short, performance-linked rehearsal can retain recognizable PBL architecture when project functions are embedded within the rehearsal process rather than added as a parallel academic exercise. In the Groove Lab design, a shared musical problem provides the focus for inquiry; recurrent rehearsal loops allow alternatives to be tested and revised; students assume responsibility for selected musical and leadership decisions; arrangement maps, planning forms, and formative prompts make those decisions discussable; and critique is connected to subsequent musical action. Audience-facing performance provides an authentic endpoint, while internal run-throughs and comparisons function as formative checkpoints rather than being treated as public products in themselves. The resulting design does not require the co-curricular ensemble to become a conventional credit-bearing project or generate extensive written coursework. Instead, PBL is operationalized through the organization of musical inquiry within rehearsal itself.

Accordingly, this article focuses on the design and implementation logic of short-format PBL rather than on demonstrating intervention effectiveness. It is guided by two analytical questions (AQs) rather than empirical research questions:

AQ1. How can core PBL principles be operationalized within short, performance-linked co-curricular ensemble rehearsal?

AQ2. What design adaptations support student inquiry, leadership, critique, and revision within the practical constraints of co-curricular ensemble learning?

These analytical questions position the Groove Labs as a case through which to examine the translation of established PBL principles into a distinctive higher music education setting. The contribution is a rehearsal-specific account of how PBL can be structured within the temporal, organizational, and artistic conditions of co-curricular ensemble rehearsal.

2. Project-based learning and ensemble rehearsal

Project-based learning is generally distinguished from shorter task-based activity by the organization of learning around a meaningful problem or challenge that sustains inquiry over time. In widely used formulations, its core features include a challenging or authentic problem, sustained inquiry, learner voice and choice, reflection, critique and revision, and a public product.[1,8] Reviews of PBL in higher education similarly emphasize active investigation, collaboration, learner responsibility, and the production or presentation of an outcome through which developing understanding is applied.[4] More recent syntheses continue to report generally positive associations across project-based and related problem-driven learning environments, while also emphasizing heterogeneity across outcomes, implementations, and the methodological quality of the accumulated evidence.[9,10] These characteristics make PBL potentially relevant to performance-based disciplines, where learning frequently develops through iterative action rather than through the acquisition of propositional knowledge alone. The important distinction, however, is between undertaking an extended activity and organizing that activity so that learners participate in the inquiry through which its problems are defined, investigated, and revised.

This distinction is especially pertinent to higher music education. Ensemble learning is inherently social, and scholarship on higher music education has emphasized the importance of peer interaction, shared responsibility, and collaborative learning within musical practice.[5,11,12] A recent systematic review of collaborative learning in conservatoire education similarly identified recurring relationships among collaborative activity, student-centered learning environments, and the development of musical, metacognitive, social, and collaborative capacities.[13] Informal and popular music pedagogies likewise demonstrate how listening, imitation, peer learning, experimentation, and learner-directed decision-making can support forms of musicianship that are difficult to separate from the social contexts in which they are practiced.[6,14] Project-based approaches extend this participatory orientation by giving collaborative activity an explicit inquiry architecture. In music, this can allow a performance goal to function not merely as something to be prepared but as a problem around which learners investigate, make decisions, test possibilities, receive critique, and revise their work. Recent applications of PBL in music education similarly indicate its compatibility with collaborative and practice-centered forms of musical learning.[15]

The correspondence between ensemble rehearsal and PBL should nevertheless not be assumed. Rehearsal can involve sustained activity, collaboration, problem-solving, and an eventual public performance while leaving the principal intellectual and musical decisions with the tutor or ensemble director. A director may diagnose an unstable transition, prescribe a different voicing, determine the dynamic shape, assign a cue, and ask the ensemble to repeat the passage. Students are actively performing and may be learning from the process, but they are not necessarily exercising substantial agency over the inquiry itself. A stronger PBL alignment requires learners to participate materially in diagnosing the musical problem, proposing or comparing responses, testing those responses in performance, evaluating what changed, and determining what should be revised. Student activity and collaboration are therefore necessary features of many ensemble projects, but neither alone establishes PBL.

The musical problems addressed through such inquiry are themselves relational, involving forms of social, musical, and nonverbal coordination among co-performers.[16,17] Groove provides a particularly useful example because it cannot be located solely in the technical accuracy of an individual performer. Research on jazz, funk, and groove-based performance has described rhythmic feel as emerging through relationships among timing, articulation, repetition, embodiment, and interaction.[18-22] Within higher music education, groove has likewise been framed pedagogically as embodied and culturally situated rather than reducible to metric accuracy alone.[23] Small differences in placement or articulation can acquire musical meaning through their relationship to the actions of other performers rather than through conformity to an abstract temporal ideal. Ensemble problems involving groove consequently require attention across parts: how bass and drums relate, how harmonic instruments occupy rhythmic and registral space, how density changes across sections, and how performers collectively create or interrupt musical direction. The Intentional Pocket framework previously developed this relational orientation pedagogically through Specific Listening, Technical Awareness, and Macro-Sight.[7] In the present analysis, however, groove functions as the musical problem around which project-based inquiry is organized rather than as a new construct requiring further validation.

Rehearsal also provides an existing mechanism for iterative inquiry because musical decisions can be enacted and evaluated immediately. Reflective practice emphasizes the capacity of practitioners to respond to situations through cycles in which action and reflection inform subsequent action.[24] In ensemble rehearsal, an arrangement decision

can be performed, heard, compared with an alternative, discussed, and revised within minutes. Yet repetition alone does not constitute sustained inquiry. Rehearsing the same passage several times under continuing tutor instruction differs pedagogically from asking ensemble members to identify why the passage is not functioning, propose an alternative, listen to its consequences, and decide what the next attempt should change. For short-format PBL, the relevant continuity may therefore reside not only in elapsed project duration but in the recurrence of connected inquiry loops through which the same musical problem is progressively reconsidered.

This creates a specific design problem for co-curricular higher music education. Extended PBL models can draw on scheduled curricular time, formal assessment, written documentation, and projects designed principally around learning objectives. In the co-curricular setting examined here, activity was instead organized around rehearsal availability and forthcoming performances. Adding extensive written tasks or a parallel assessment structure risks displacing the musical practice through which the inquiry is intended to occur. The pedagogical challenge is therefore one of translation rather than simply adoption: how to preserve recognizable PBL functions while adapting their enactment to the temporal, organizational, and artistic conditions of rehearsal. The analysis that follows examines this translation through the Groove Lab design, focusing on how inquiry was compressed into recurrent rehearsal loops, how musical decision-making and leadership were distributed, how lightweight artifacts supported critique and revision, and how those processes were connected to an audience-facing performance.

3. Context and design-analytical approach

The pedagogical design examined in this article was developed within a co-curricular contemporary vocal and instrumental ensemble at a Singapore university. The ensemble worked with groove-based popular and contemporary repertoire and brought together musicians with differing levels and forms of prior ensemble experience. Groove Lab cycles were embedded within the ensemble's existing rehearsal and performance schedule rather than delivered as a separate credit-bearing course. A typical cycle extended across approximately three to six rehearsals leading toward an audience-facing performance or showcase. This setting imposed practical constraints on the design: inquiry had to remain musically productive within limited contact time, accommodate differences in experience and participation, and contribute directly to repertoire already being prepared for performance.

The Groove Labs developed from pedagogical work previously reported through the Intentional Pocket Project.[7] That publication documented the underlying jazz-informed framework, workshop intervention, and participant responses concerning ensemble fluency. The present article uses the same broader pedagogical lineage but addresses a different object of analysis. It does not reanalyze participant ratings, written feedback, quotations, or outcome findings from the earlier study. Nor does it treat previously reported changes in timing, role clarity, cohesion, or other aspects of ensemble performance as evidence for the claims advanced here. The object of analysis is instead the design architecture through which established PBL principles were translated into short-format ensemble rehearsal.

The analysis draws on facilitator-developed pedagogical materials used to organize the Groove Lab cycles. These include session and rehearsal-task designs, arrangement-map structures, the Band Leadership Planning Form, formative rehearsal prompts, and the architecture of a rehearsal rubric used to direct attention toward selected ensemble processes. These materials are treated as artifacts of pedagogical design rather than as measures of participant attainment. Facilitator planning documentation was used solely to reconstruct the intended sequence and function of rehearsal activities, not to infer changes in individual students or establish intervention effectiveness. No participant-derived data are analyzed in this article. Student feedback, ratings, quotations, identifiable work, and individual assessment records generated within the wider pedagogical setting are outside the present analysis.

Facilitator reflection also informed the practice-led interpretation of these materials, particularly in reconstructing why particular rehearsal structures, prompts, and sequencing decisions were used. This reflection was not treated as a separately collected or coded qualitative dataset and was not used to infer participant learning or intervention effectiveness.

The analysis proceeded in two stages. First, the design components were examined in relation to the PBL functions that informed their development: engagement with a meaningful or challenging problem, sustained inquiry, learner voice and choice, reflection, critique and revision, and connection to a public product.[1,4,8] Because these functions formed part of the design rationale, the purpose was not to score the Groove Labs post hoc against a checklist, but to examine how each function was enacted within rehearsal activity. Particular attention was given to who diagnosed musical problems, who made consequential rehearsal decisions, how alternatives were tested, how critique informed subsequent action, and how rehearsal activity connected to an audience-facing performance.

Second, the analysis examined the adaptations required for those PBL functions to operate within a short, co-curricular rehearsal ecology. This involved tracing how inquiry was compressed into recurrent cycles of musical action and revision; how responsibility for selected decisions was distributed among ensemble members; how lightweight artifacts externalized otherwise tacit rehearsal choices; and how critique, reflection, and revision were incorporated without introducing extensive written coursework or a parallel assessment system. The resulting account is therefore a practice-led analysis of pedagogical design rather than an independent evaluation of learning outcomes. The author's position as designer, facilitator, and analyst provides direct access to the rationale and development of the design but also limits claims of independent evaluation. Accordingly, the analysis does not test causal effectiveness, comparative superiority, learning gain, or generalizability. Its claims concern how PBL principles were operationalized within this particular rehearsal design and the adaptations that made that translation practicable.

4. Translating project-based learning into short-format ensemble rehearsal

4.1. Framing rehearsal as a musical inquiry problem

The Groove Lab cycle was organized around the driving question, "How can a small ensemble design and sustain an intentional pocket for stylistically authentic performance?" The question converted a familiar but potentially vague rehearsal aspiration—playing "in the pocket"—into a shared problem requiring investigation and decision-making. Intentional Pocket supplied the musical orientation for that investigation through attention to Specific Listening, Technical Awareness, and Macro-Sight[7], while PBL supplied the pedagogical architecture through which the problem was pursued. The ensemble-facing orientation is also consistent with later work on groove fluency, which emphasizes stable time, differentiated sound, density shaping, and cue-aware interaction as interconnected rather than isolated capacities.[25]

The driving question was made concrete through problems already present in the ensemble's repertoire. Rather than treating groove solely as rhythmic accuracy, students could be asked to determine whether the bass and drums were establishing a compatible feel, whether a keyboard or guitar part occupied too much rhythmic or registral space, whether a section required increased or decreased textural density, or how a transition should be cued and dynamically shaped. Similar questions extended beyond the rhythm section: which instrument should carry a foreground function at a particular moment, what should supporting players omit, and how should the ensemble create contrast between adjacent sections? These were not additional exercises detached from performance preparation. They reframed repertoire problems as objects of collaborative inquiry within the rehearsal itself.

Such inquiry was not treated as unconstrained social negotiation. The range of musically defensible alternatives remained conditioned by the material being rehearsed, including form, harmony, rhythm, texture, instrumentation, stylistic convention, and the available notated, recorded, compositional, or arranging sources. Where a work carried identifiable compositional or arranging intentions, these formed part of the constraints within which students exercised judgment. In repertoire learned primarily through recordings or performance conventions rather than a fixed score, analogous constraints arose from the source performance, style, and ensemble function. Student agency therefore operated within musical as well as practical constraints.

4.2. Compressing sustained inquiry into rehearsal loops

A central adaptation concerned sustained inquiry. The Groove Labs did not attempt to reproduce the duration of a semester-long project within a co-curricular ensemble. Instead, continuity was created through recurrent inquiry loops across approximately three to six rehearsals. A typical loop can be represented as follows: identify a musical problem, test a response, listen to the result, compare alternatives, revise the decision, and test again. The object of inquiry could persist across several loops, even when each loop occupied only a few minutes of rehearsal. Sustained inquiry was therefore treated as continuity of engagement with a musical problem rather than simply as elapsed project duration. The recurrent short-format PBL rehearsal cycle is summarized in Figure 1.

For example, a dense verse might initially be identified as lacking textural clarity. The ensemble could test a narrower keyboard register, remove a guitar layer, alter an accompaniment rhythm, or delay the entry of an additional instrument. Each alternative would produce an immediately audible result that could be compared with the previous version. A transition that feels unstable can similarly be approached by testing different cueing strategies, dynamic trajectories, or allocations of responsibility among performers. Groove-related problems can be investigated by changing articulation, subdivision, rhythmic density, or the relationship between bass and drum patterns. In each case, the rehearsal task is not merely to repeat a passage until it improves, but to connect successive performances through an explicit sequence of diagnosis, musical action, listening, and revision.

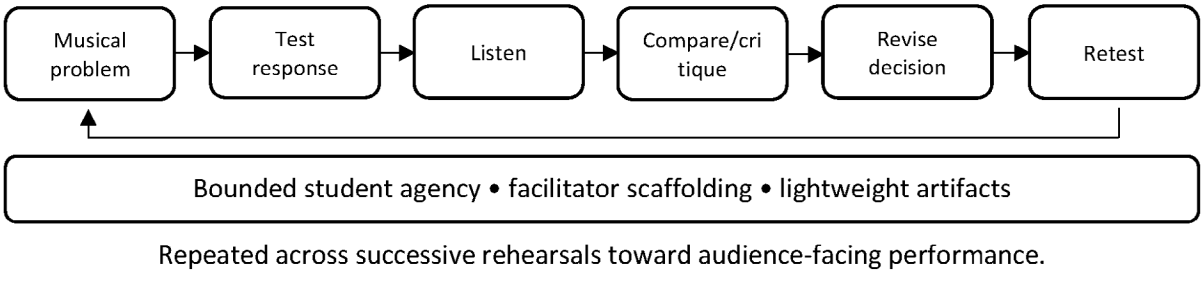


Figure 1. Recurrent short-format project-based learning rehearsal cycle

This compression distinguishes short-format PBL from simply shortening a conventional project. Removing weeks from a longer project would not itself preserve its inquiry structure. In the Groove Lab design, compression instead depends on the density with which project functions recur inside ordinary rehearsal. Musical performance allows this density because proposed solutions can be enacted and evaluated almost immediately. A rehearsal may therefore contain several linked cycles of inquiry without requiring extensive activity outside the rehearsal room. This does not establish that a shorter format is equivalent to extended PBL; rather, it identifies recurrent engagement with the same developing problem as the mechanism through which sustained inquiry can remain recognizable under tighter temporal constraints.

4.3. Distributing voice, choice, and rehearsal leadership

Short-format inquiry also required a deliberate redistribution of musical decision-making. Collaboration alone was insufficient, because ensemble members could collaborate efficiently while continuing to enact decisions made principally by the facilitator. The Groove Lab design therefore assigned students responsibility for selected decisions concerning form, texture, cueing, dynamic contour, instrumental roles, and rehearsal priorities. The extent of this responsibility could vary according to repertoire and experience, but the underlying principle remained that students should contribute to determining what the musical problem was and what response should be tested, rather than only performing a prescribed solution.

The Band Leadership Planning Form provided one scaffold for this process. Before or during rehearsal, a student leader could identify important formal sections, anticipated transitions, dynamic changes, cueing responsibilities, textural priorities, and possible rehearsal problems. The purpose was not to produce an assessed written plan. It was to require selected musical intentions to be articulated before they were enacted and to give the ensemble something concrete against which the subsequent result could be considered. Leadership could rotate across rehearsals or repertoire, allowing responsibility for directing attention and proposing solutions to move among ensemble members rather than becoming attached permanently to a single student.

Distributed responsibility did not require the facilitator to withdraw expertise. The facilitator could model a listening strategy, demonstrate an instrumental possibility, identify a constraint, ask a diagnostic question, or intervene when a proposed solution was technically impracticable. The pedagogical shift concerned when and how that expertise was used. Instead of immediately resolving every rehearsal problem, the facilitator could frame the problem and establish conditions under which students compared possible responses. A keyboardist, for example, might be prompted to reconsider register after listening to the bass rather than simply being assigned a replacement voicing. Where electronic keyboard sound or patch choice affected the ensemble texture, the same principle could extend to timbral decisions as part of the instrument's functional ensemble role.[26] Teacher expertise thus remained available while selected acts of diagnosis, choice, and revision became shared responsibilities.

4.4. Externalizing critique and revision without academicizing rehearsal

A further design problem was how to make inquiry visible enough to support critique without turning a co-curricular rehearsal into a paperwork-intensive academic project. The Groove Labs used lightweight artifacts and prompts for this purpose. Arrangement maps could indicate form, density, entries, breakdowns, or dynamic direction; leadership plans could record anticipated decisions; and short rehearsal prompts could focus attention on a specific relationship before another run-through. These devices externalized otherwise tacit choices sufficiently for ensemble members to discuss, test, and revise them while leaving musical performance as the principal site of inquiry.

Internal A/B comparisons provided a particularly direct form of critique. An ensemble could perform one version of a passage, alter a defined musical variable, and immediately perform the alternative. Discussion could then address a concrete comparison: which version better established the intended groove, clarified the foreground role, supported the vocalist, or shaped the transition? Critique was consequently connected to another musical action rather than ending with verbal evaluation. This emphasis on using evaluative information to inform subsequent action is consistent with feedback-literacy accounts that foreground uptake and learner agency rather than feedback transmission alone.[27] Reflection could likewise remain brief and embedded: what changed, what was heard differently, what should be retained, and what should the next attempt test? The objective was not to maximize documentation but to prevent successive run-throughs from becoming disconnected repetitions.

The formative rehearsal rubric served a similar function. It was used to direct shared attention toward selected aspects of ensemble process and provide vocabulary for discussion rather than to convert complex musical quality into a comprehensive numerical judgment. A rubric can foreground particular evidence while inevitably leaving other dimensions of performance outside its frame; preset criteria do not fully represent the complexity of qualitative judgment, so treating the rubric as a scaffold rather than a complete representation of artistic quality limits the interpretive weight placed on its criteria.[28] Within the Groove Labs, its value lay in helping ensemble members identify what to listen for and what might require revision. The broader design principle was economy: enough external structure to sustain inquiry and make decisions revisable, but not so much documentation that project administration displaced rehearsal itself.

4.5. Connecting revision to an audience-facing product

The distinction between formative rehearsal events and the public product was also important. Internal run-throughs, recordings, A/B comparisons, and in-rehearsal sharings functioned as checkpoints through which musical decisions could be tested. They were not treated as public products merely because a complete performance occurred. The audience-facing concert, showcase, or comparable performance toward which the ensemble was already working supplied the authentic public endpoint. This allowed the Groove Lab cycle to connect inquiry to a consequential musical event without creating an additional presentation solely to satisfy a PBL requirement.

The existing performance calendar consequently became part of the pedagogical design rather than a competing demand on it. Decisions about groove, texture, cueing, dynamics, and ensemble roles were developed in relation to repertoire that would actually be performed, and revisions had to remain feasible within the time available before that performance. The public endpoint provided a reason for decisions to converge, while the preceding rehearsal loops preserved opportunities for experimentation and revision. Across the design, the resulting sequence was therefore not simply rehearse and perform, but frame a musical problem, investigate it through repeated performance, distribute selected decisions, externalize and critique those decisions, revise them, and carry the resulting choices into an audience-facing performance. In this way, established PBL functions were embedded within the ensemble's existing musical work rather than added as a separate curricular layer.

5. Discussion

5.1. From active rehearsal to project-based inquiry

The analysis addresses the first analytical question by showing that PBL can be operationalized within short-format ensemble rehearsal through the organization of agency around a shared musical problem. The distinguishing feature is not that students are active, collaborative, or preparing a performance; each of these conditions can exist within conventional tutor-directed rehearsal. Rather, the PBL architecture becomes visible when students participate materially in diagnosing what is not working, proposing and comparing alternatives, enacting those alternatives, evaluating their musical consequences, and determining what should subsequently change. In this sense, the shift from rehearsal activity to project-based inquiry concerns the distribution of responsibility for the inquiry process rather than the presence of activity itself.

This distinction helps clarify the relationship between PBL and established collaborative practices in higher music education. Peer learning, ensemble participation, and informal learning already provide strong precedents for distributing musical responsibility.[5,6] PBL adds a more explicit relationship among problem, inquiry, revision, and product. Within the Groove Labs, these functions were not introduced as a separate sequence of academic exercises. They were integrated into musical work that the ensemble already needed to undertake, so that decisions about groove, texture, cueing, dynamics, and role became the substance of inquiry. The resulting design therefore does not propose that ensemble rehearsal should be replaced by project work; it identifies conditions under which rehearsal itself can be deliberately organized as project-based inquiry.

5.2. Sustained inquiry under temporal compression

The analysis also suggests that duration alone is an insufficient indicator of whether inquiry is sustained. Extended projects provide obvious opportunities for investigation over time, but the pedagogically relevant question in a short rehearsal cycle is whether successive actions remain connected to a developing problem. The Groove Labs addressed this through recurrent loops in which a problem was identified, a response tested, its consequences heard and compared, and a subsequent revision selected. What persists across the cycle is therefore not necessarily a lengthy sequence of distinct project activities, but an unresolved musical problem that is repeatedly reconsidered through performance.

This should not be interpreted as evidence that short-format PBL is equivalent to longer project designs or produces comparable learning outcomes. The present analysis does not test that proposition. It instead identifies a design mechanism through which recognizable inquiry functions can be retained when available time is limited. Musical rehearsal is conducive to such compression because proposed solutions can often be enacted and evaluated immediately: a voicing can be changed, an entry delayed, a texture thinned, a cue reassigned, or a rhythmic relationship altered and then heard in the next run. Short-format PBL may therefore depend less on reproducing the timetable of an extended project than on maintaining sufficient continuity and recurrence among problem identification, testing, critique, and revision.

5.3. Co-curricular constraints as design conditions

The second analytical question concerns the adaptations required by co-curricular ensemble learning. Limited rehearsal time, differing musical backgrounds, performance deadlines, and the absence of a formal assessment structure could be regarded simply as restrictions on PBL implementation. In the Groove Lab design, however, these conditions also shaped how the pedagogy was constructed. Inquiry was embedded in repertoire that the ensemble was already preparing; leadership responsibilities were bounded rather than wholly open-ended; reflection occurred largely through brief discussion and subsequent musical action; and planning artifacts were kept deliberately lightweight. The design therefore sought to preserve the functions of PBL without importing the full apparatus of a credit-bearing academic project.

This has implications for the role of the educator. Increasing student voice and choice does not require the facilitator to relinquish musical expertise or allow every aspect of rehearsal to become negotiable. In time-constrained performance settings, complete openness may itself be pedagogically or artistically unproductive. The Groove Labs instead distributed agency within bounded tasks: students were given consequential responsibility while musical and practical constraints remained partly scaffolded by the facilitator. Expertise could be used to model listening, establish limits, identify technically infeasible options, or redirect attention, while still withholding an immediate solution where productive inquiry was possible. Distributed leadership in this sense concerns the purposeful redistribution of selected acts of musical judgment rather than the disappearance of instructional authority.

The same principle explains the use of lightweight artifacts. Arrangement maps, planning forms, prompts, and rubric criteria were useful insofar as they made musical intentions available for collective scrutiny and revision. Their function was not to document every stage of the project or generate evidence for assessment. This matters in a rehearsal ecology because excessive documentation can compete directly with the embodied and aural activity through which musical problems are investigated. The practical aim is to make enough of the ensemble's otherwise tacit decision-making visible to support inquiry, critique, and revision while keeping performance and listening at the center of the learning process.

5.4. Transfer lies in design functions rather than musical vocabulary

The Groove Labs originated in contemporary groove-oriented ensemble practice, and their terminology reflects that context. Concepts such as pocket, rhythmic density, register, cueing, and rhythm-section interaction may not transfer unchanged to every ensemble tradition. The underlying PBL functions, however, can be separated from the particular musical vocabulary through which they were enacted. A vocal ensemble might investigate blend, consonant placement, breath, or phrasing; a chamber ensemble might focus on attack, balance, articulation, releases, or the distribution of phrase direction. In each case, the relevant design question remains whether learners participate in defining a consequential musical problem, testing possible responses, critiquing what they hear, revising their decisions, and carrying those decisions toward an authentic performance.

Transferability should therefore be understood as adaptation rather than replication. The present analysis does not establish that the Groove Lab format will function identically across genres, institutions, or ensemble types. Instead, it separates the context-specific content of Intentional Pocket from the more general pedagogical architecture through which that content was investigated.

What is offered for adaptation is not a universal vocabulary for ensemble learning, but a set of PBL design functions that educators can translate into the musical problems, rehearsal conventions, and performance expectations of their own settings. In conductor-led orchestras, choirs, or other ensemble traditions with more centralized interpretive authority, student agency may therefore need to be introduced through narrower and more explicitly scaffolded decisions—for example, section-level listening, comparative interpretation, or bounded rehearsal leadership—rather than through an immediate redistribution of broader rehearsal decision-making.

6. Implications and limitations

The design analysis has several implications for educators seeking to use PBL within ensemble settings without constructing a separate project around the rehearsal process. First, the unit of design can remain the musical problem. Educators do not necessarily need to add a written assignment, research presentation, or portfolio for inquiry to become explicit. A rehearsal problem can instead be framed so that students must identify relevant musical relationships, propose alternatives, test them through performance, and use what they hear to determine subsequent action. The practical question for the educator is therefore not simply whether students are active, but which consequential decisions they are being asked to make.

Second, student agency can be distributed selectively. Short rehearsal cycles may not permit every musical or organizational decision to be opened to collective negotiation, nor would doing so necessarily serve the performance. Educators can instead identify decisions that are both musically consequential and realistically transferable to students: determining a cueing strategy, comparing textural alternatives, allocating foreground and supporting roles, shaping a transition, diagnosing a groove relationship, or establishing priorities for a subsequent run-through. The facilitator can retain responsibility for safety, feasibility, scheduling, and other non-negotiable constraints while deliberately withholding solutions where student inquiry can productively occur.

Third, documentation should be proportionate to its pedagogical function. A planning form, arrangement map, rehearsal prompt, or small set of rubric criteria is useful when it enables a decision to be articulated, compared, remembered, or revised. Documentation becomes less useful when producing it consumes time without materially affecting subsequent musical action. For co-curricular settings in particular, educators can therefore ask whether an artifact changes what students listen for, discuss, decide, or perform. If it does not, its inclusion in the project architecture may be difficult to justify.

These implications should be interpreted within the limits of the analysis. The article examines a pedagogical design developed by the practitioner who also conducted the analysis, within one co-curricular contemporary ensemble setting. This positionality provides access to the design rationale and its evolution but does not provide independent evidence of its effectiveness. The analysis does not compare the Groove Labs with conventional rehearsal, extended PBL, or another pedagogical approach, and it does not establish changes in student learning, ensemble fluency, leadership, musical judgment, or performance quality. Previously reported participant responses associated with the Intentional Pocket Project are not reanalyzed here and should not be treated as evidence for the PBL claims advanced in this article.

The analysis is also bounded by repertoire and context. Groove-oriented contemporary ensemble practice makes some forms of relational musical problems particularly salient and allows proposed solutions to be tested rapidly through performance. Other ensemble traditions may involve different distributions of authority, rehearsal conventions, musical problems, or relationships between rehearsal and public performance. The proposed design functions therefore require contextual adaptation rather than direct replication. Further research could examine their use across different ensemble types and institutional settings and, where appropriate, ethical approval and research design are in place, investigate how particular configurations of student agency, recurrent inquiry, critique, and lightweight externalization relate to learning processes or outcomes. Future iterations could also incorporate external observation, peer debriefing, or independent analysis of rehearsal processes to reduce dependence on practitioner interpretation and triangulate the design account across perspectives.

7. Conclusion

Ensemble rehearsal can resemble PBL without necessarily being organized as project-based inquiry. This article has examined how established PBL principles can be translated into short, performance-linked co-curricular rehearsal by locating inquiry within the musical work itself. In the Groove Lab design, a shared musical problem focuses inquiry; recurrent rehearsal loops connect diagnosis, testing, listening, and revision; selected decisions are distributed among students; lightweight artifacts make those decisions available for critique; and an existing audience-facing performance provides an authentic public endpoint. The resulting design approach does not

depend on reproducing the duration, documentation, or assessment structures of a conventional credit-bearing project.

The central implication of this analysis is that short-format PBL can be understood as a problem of pedagogical design rather than simple duration. Compressing a project does not preserve PBL merely by reducing its timetable. What must remain recognizable are the relationships among problem, learner agency, inquiry, critique, revision, and product. In co-curricular ensemble settings, those functions can be embedded within rehearsal while musical performance remains the principal mode through which alternatives are investigated and evaluated. The account is deliberately bounded: it offers a design logic for adaptation rather than evidence of intervention effectiveness or a universal model for ensemble pedagogy.

Acknowledgments

None.

Funding

None.

Conflict of interest

The author declares no competing interests.

Author contributions

This is a single-authored article.

Ethics approval and consent to participate

Not applicable. This article analyzes pedagogical design materials and does not report or analyze human-participant data.

Consent for publication

Not applicable.

Availability of data

Not applicable. No participant dataset is analyzed or reported in this article.

Further disclosure

Generative AI tools were used during manuscript preparation to support language refinement, structural editing, and formatting of author-developed material. The author retained full responsibility for the scholarly content, interpretation, argumentation, source verification, and final text. AI tools were not used to generate or analyze participant data or to determine the article's scholarly conclusions.

References

1. Larmer J, Mergendoller JR, Boss S. *Setting the Standard for Project-Based Learning: A Proven Approach to Rigorous Classroom Instruction*. ASCD; 2015.
2. Helle L, Tynjälä P, Olkinuora E. Project-based learning in post-secondary education—theory, practice and rubber sling shots. *Higher Educ.* 2006;51(2):287-314.

   doi:10.1007/s10734-004-6386-5
3. Kokotsaki D, Menzies V, Wiggins A. Project-based learning: a review of the literature. *Improv Sch.* 2016;19(3):267-277.

   doi:10.1177/1365480216659733
4. Guo P, Saab N, Post LS, Admiraal W. A review of project-based learning in higher education: student outcomes and measures. *Int J Educ Res.* 2020;102:101586.

   doi:10.1016/j.ijer.2020.101586
5. Gaunt H, Westerlund H, eds. *Collaborative Learning in Higher Music Education*. Ashgate; 2013.
6. Green L. *How Popular Musicians Learn: A Way Ahead for Music Education*. Ashgate; 2002.
7. Seow E. The Intentional Pocket Project: a jazz-informed workshop series for emerging ensemble musicians. *Jazz Educ Res Pract.* 2026;7(1):98-119.

   doi:10.2979/jerp.00017
8. Sánchez-García R, Reyes-de-Cózar S. Enhancing project-based learning: a framework for optimizing structural design and implementation—a systematic review with a sustainable focus. *Sustainability.* 2025;17(11):4978.

   doi:10.3390/su17114978
9. Wijnia L, Noordzij G, Arends LR, Rikers RMJP, Loyens SMM. The effects of problem-based, project-based, and case-based learning on students' motivation: a meta-analysis. *Educ Psychol Rev*. 2024;36(1):29.

   doi:10.1007/s10648-024-09864-3
10. Farshad S, Fortin C. An umbrella review of meta-analyses on project-based learning: effects on academic achievement, higher-order thinking, and 21st-century skills. *Educ Res Rev.* 2026;52:100809.

    doi:10.1016/j.edurev.2026.100809
11. Hanken IM. Peer learning in specialist higher music education. *Arts Humanit High Educ.* 2016;15(3-4):364-375.

    doi:10.1177/1474022216647389
12. Forbes M. The value of collaborative learning for music practice in higher education. *Br J Music Educ.* 2020;37(3):207-220.

    doi:10.1017/S0265051720000200
13. Rumiantsev T, van der Rijst R, Admiraal W. A systematic literature review of collaborative learning in conservatoire

education. *Soc Sci Humanit Open.* 2023;8(1):100683.

doi:10.1016/j.ssaho.2023.100683

14. Lebler D. Popular music pedagogy: peer learning in practice. *Music Educ Res.* 2008;10(2):193-213.

doi:10.1080/14613800802079056

15. Cuervo-Calvo L, Cabedo-Mas A. Service-learning and project-based learning methodologies in higher music education: a review of the literature. *Bordón Rev Pedagog.* 2024;76(3):35-60.

doi:10.13042/Bordon.2024.99887

16. Davidson JW, Good JMM. Social and musical co-ordination between members of a string quartet: an exploratory study. *Psychol Music.* 2002;30(2):186-201.

doi:10.1177/0305735602302005

17. Williamon A, Davidson JW. Exploring co-performer communication. *Musicae Sci.* 2002;6(1):53-72.

doi:10.1177/102986490200600103

18. Keil C. Participatory discrepancies and the power of music. *Cult Anthropol.* 1987;2(3):275-283.

doi:10.1525/can.1987.2.3.02a00010

19. Monson I. *Saying Something: Jazz Improvisation and Interaction*. University of Chicago Press; 1996.

20. Iyer V. Embodied mind, situated cognition, and expressive microtiming in African-American music. *Music Percept.* 2002;19(3):387-414.

doi:10.1525/mp.2002.19.3.387

21. Danielsen A. *Presence and Pleasure: The Funk Grooves of James Brown and Parliament*. Wesleyan University Press; 2006.

22. Butterfield MW. Participatory discrepancies and the perception of beats in jazz. *Music Percept.* 2010;27(3):157-176.

doi:10.1525/mp.2010.27.3.157

23. Seow E. Decolonising the rhythm curriculum: integrating global groove practices in undergraduate aural skills. *Music Educ Res.* 2025;27(5):593-603.

doi:10.1080/14613808.2025.2565148

24. Schön DA. *The Reflective Practitioner: How Professionals Think in Action*. Basic Books; 1983.

25. Seow E. Motion before patterns: a pedagogical framework for cajón groove fluency in low-volume acoustic ensemble contexts. *Malays J Music.* 2026;15(1):39-59.

doi:10.37134//mjm.vol15.1.3.2026

26. Seow E. More than just piano: patch literacy as a core competency in contemporary ensemble practice. *Coll Music Symp.* 2026;66(1):99-116.

doi:10.18177/sym.2026.66.9661

27. Carless D, Boud D. The development of student feedback literacy: enabling uptake of feedback. *Assess Eval High Educ.* 2018;43(8):1315-1325.

doi:10.1080/02602938.2018.1463354

28. Sadler DR. Indeterminacy in the use of preset criteria for assessment and grading. *Assess Eval High Educ.* 2009;34(2):159-179.

doi:10.1080/02602930801956059