

PRACTICE BEYOND INSTRUCTION: EXPLORING PRACTICE STRATEGIES IN PRIMARY SCHOOL DRUM LEARNING

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Abstract

This study addresses the limited attention given to independent practice in primary music education by examining how young students structure drum practice beyond direct instruction in a non-formal setting. A qualitative design was employed involving four students aged seven to nine, using participant observation, semi-structured interviews, and document analysis during thirty-minute sessions. Inductive thematic analysis revealed that students consistently initiated practice by revisiting previously learned 4/4 grooves, using prior material as a structural anchor. Despite tempo instability and coordination challenges between the hi-hat and bass drum, students maintained rhythmic coherence while negotiating motor demands. Problem-solving was predominantly global, relying on whole-pattern repetition rather than segmentation. Practice organization emerged implicitly, progressing from hi-hat stabilization toward full groove integration. These findings highlight early-stage self-structured practice behaviors and extend understanding of independent practice in drum learning. However, the small sample and single-context design limit generalizability. Future research should involve larger samples and longitudinal approaches to examine developmental progression in practice strategies.

Keywords: Drum learning, Independent practice, Primary school students, Practice strategies.

INTRODUCTION

At the primary school level, music education is commonly delivered in structured, formal environments, such as classrooms or designated music spaces, where the teacher serves as the central facilitator of learning¹. In instrumental instruction, particularly in drum learning, instruction often focuses on developing basic technique, motor coordination, and the ability to perform prescribed rhythmic patterns as outlined in curricular materials². While such approaches are essential for

¹ Arielle Bonneville-Roussy, Emese Hruska, and Hayley Trower, "Teaching Music to Support Students: How Autonomy-Supportive Music Teachers Increase Students' Well-Being," *Journal of Research in Music Education* 68, no. 1 (April 2020): 97–119, <https://doi.org/10.1177/0022429419897611>; Andrew Goodrich and Kinh Ti n V , "Engaged Pedagogy in Teacher Education: A Literature Review," *International Journal of Music Education* 43, no. 2 (May 14, 2025): 217–28, <https://doi.org/10.1177/02557614231198198>.

² Thenille Braun Janzen et al., "Rhythm and Music-Based Interventions in Motor Rehabilitation: Current Evidence and Future Perspectives," *Frontiers in Human Neuroscience* 15, no. January (2022): 1–21, <https://doi.org/10.3389/fnhum.2021.789467>.

establishing foundational musical skills, they tend to position independent practice outside formal instruction as a less-examined aspect within primary music education research.

Within the history of music education research, independent practice has long been considered an important part of learning instrumental skills. Research has shown that students' musical development is affected by the qualitative level of pedagogical engagements in the formal lessons, and how the students use their independent practice time to rehearse, refine, and build on the skills that have been taught to them³. This includes the many practical decisions made in practice; for example, what to repeat, how to adjust the tempo, and how to resolve and overcome technical difficulties. Therefore, for an independent practice, the musical learning attained can be considered a significant learning space that meaningfully contributes to a child's musical learning. Research in music education has, prior to now, been able to deal with practice strategies concretely, as the methods that students use to regulate and control their practice processes⁴.

These strategies include focused repetition, the breaking down of a piece of music to be practiced in smaller sections, different practice speeds (using slower tempos in practice), and the practice of different types of techniques for different objectives⁵. Research has shown that the strategies used are far more important than the practice time in determining the impact of practice on students' music development. The latest findings in this area highlight the importance of informal learning by the students and independent practice in instruction in learning instruments⁶. There is, however, a predominance of research focusing on the experience of secondary and tertiary level students, and research on instruments like the piano and the violin⁷.

When it comes to learning drums and music at the primary school level, the challenges and characteristics of learning drums differ significantly from those of learning other instruments. The drum, being a percussion instrument, requires the use of hands and feet in a coordinated manner, and in addition, it also involves energy and maintaining a beat⁸. Given these demands, the success of drum

³ Bonneville-Roussy, Hruska, and Trower, "Teaching Music to Support Students: How Autonomy-Supportive Music Teachers Increase Students' Well-Being"; Zijia Cheng and Jane Southcott, "Practice and Learning the Piano: Motivation and Self-Regulation," *International Journal of Music Education* 41, no. 3 (August 20, 2023): 345–57, <https://doi.org/10.1177/02557614221125173>; Yangtao Kong, "The Role of Experiential Learning on Students' Motivation and Classroom Engagement," *Frontiers in Psychology* 12 (October 22, 2021), <https://doi.org/10.3389/fpsyg.2021.771272>.

⁴ David Z. Hambrick, Brooke N. Macnamara, and Frederick L. Oswald, "Is the Deliberate Practice View Defensible? A Review of Evidence and Discussion of Issues," *Frontiers in Psychology* 11 (August 18, 2020), <https://doi.org/10.3389/fpsyg.2020.01134>; Angela Love et al., "Impact of Deliberate Practice on Point-of-Care Ultrasound Interpretation of Right Ventricle Pathology," *ATS Scholar* 3, no. 2 (June 1, 2022): 229–41, <https://doi.org/10.34197/ats-scholar.2021-00800C>.

⁵ Muriel M. K. Bruchhage et al., "Drum Training Induces Long-Term Plasticity in the Cerebellum and Connected Cortical Thickness," *Scientific Reports* 10, no. 1 (June 22, 2020): 10116, <https://doi.org/10.1038/s41598-020-65877-2>; Edoardo Passarotto et al., "Musical Expertise and Executive Functions in Experienced Musicians," *Brain Sciences* 13, no. 6 (June 4, 2023): 908, <https://doi.org/10.3390/brainsci13060908>.

⁶ Johnmarshall Reeve, Sung Hyeon Cheon, and Tae Ho Yu, "An Autonomy-Supportive Intervention to Develop Students' Resilience by Boosting Agentic Engagement," *International Journal of Behavioral Development* 44, no. 4 (July 25, 2020): 325–38, <https://doi.org/10.1177/0165025420911103>; Stephanie L R MacArthur, Jane W Davidson, and Amanda E Krause, "Interpreting 7-Year-Old Beginner Cellists' Experiences of Practice," *Research Studies in Music Education* 46, no. 1 (April 20, 2024): 114–33, <https://doi.org/10.1177/1321103X231209717>.

⁷ Sum Yi Lei et al., "Exploring the Aids of Social Media for Musical Instrument Education," *International Journal of Music Education* 39, no. 2 (May 5, 2021): 187–201, <https://doi.org/10.1177/0255761420986217>; Anna Serbati et al., "Exploring Good Teaching Practices and Needs for Improvement: Implications for Staff Development," *ECPS - Educational Cultural and Psychological Studies*, no. 21 (June 8, 2020), <https://doi.org/10.7358/ecps-2020-021-serb>.

⁸ Piter Sembiring, Yudi Sukmayadi, and Sandie Gunara, "Joyful Learning: An Effective Strategies for Interactive Drum Learning," *Jurnal Paedagogy* 12, no. 2 (April 25, 2025): 305, <https://doi.org/10.33394/jp.v12i2.14825>.

practice is especially reliant on students' chosen practice strategies, especially when practice occurs in the absence of direct supervision from the teacher⁹. Research on primary school students and on strategies for practice developed and used outside the classroom remains scarce in the existing literature.

In addition, much of the research on independent practice has focused on quantitative factors, such as frequency and duration of practice, and has paid significantly less attention to the internal processes and practical reasoning of students during practice¹⁰. These types of approaches tend to greatly oversimplify students' learning experiences, particularly at the primary school level, where learning and practicing strategies usually develop spontaneously and in context through direct contact with the instrument¹¹.

This study contributes to the field by focusing specifically on early-stage drum learners in primary education. This group remains underrepresented in research on independent practice, particularly within percussion contexts. Unlike prior studies that emphasize melodic instruments or older learners, this study examines how young students organize and enact practice behaviors within a structured yet non-formal learning environment. The study is guided by the following research questions: (1) How do primary school students structure drum practice during non-instructional moments? (2) What strategies do students use to address technical challenges during practice? (3) How is practice implicitly organized within the learning setting? The remainder of this article is structured as follows: the next section outlines the research methodology, presents the findings and discussion, and concludes with key implications and directions for future research.

RESEARCH METHODS

This study employed a qualitative descriptive approach to examine how primary school students engage in drum practice during moments without direct instructional guidance. A qualitative descriptive design was selected as it allows for detailed examination of observable behaviors and participants' perspectives within natural learning contexts, without imposing highly abstract theoretical interpretation¹². This approach was appropriate for capturing how students structure their practice and respond to technical challenges in real-time learning situations.

⁹ Allyson F. Hadwin et al., "Do Self-Regulated Learning Practices and Intervention Mitigate the Impact of Academic Challenges and COVID-19 Distress on Academic Performance During Online Learning?," *Frontiers in Psychology* 13 (March 16, 2022), <https://doi.org/10.3389/fpsyg.2022.813529>; Piter Sembiring et al., "Implementasi Metode Gots Dalam Pembelajaran Drum Bagi Siswa Sekolah Dasar Di Favore Music Implementation of the Gots Method in Drum Learning for Elementary School Students at Favore Music," *Jurnal Pendidikan Dan Teknologi Indonesia* 5, no. 2 (2024): 331–40, <https://doi.org/https://doi.org/10.52436/1.jpti.659>.

¹⁰ MeganClaire Cogliano, Matthew L. Bernacki, and CarolAnne M. Kardash, "A Metacognitive Retrieval Practice Intervention to Improve Undergraduates' Monitoring and Control Processes and Use of Performance Feedback for Classroom Learning.," *Journal of Educational Psychology* 113, no. 7 (October 2021): 1421–40, <https://doi.org/10.1037/edu0000624>; Corinna Schuster et al., "Transfer of Metacognitive Skills in Self-Regulated Learning: An Experimental Training Study," *Metacognition and Learning* 15, no. 3 (December 20, 2020): 455–77, <https://doi.org/10.1007/s11409-020-09237-5>.

¹¹ Alice Lee, "Teacher Embodiment of Culturally Responsive Pedagogies in a Fifth Grade Classroom," *Profesorado, Revista de Currículum y Formación Del Profesorado* 25, no. 3 (November 24, 2021): 91–110, <https://doi.org/10.30827/profesorado.v25i3.21461>.

¹² J W Creswell and V L P Clark, *Designing and Conducting Mixed Methods Research* (SAGE Publications, 2017), <https://books.google.co.id/books?id=eTwmDwAAQBAJ>; Debaro Huyler and Craig M. McGill, "Research Design: Qualitative, Quantitative, and Mixed Methods Approaches, by John Creswell and J. David Creswell. Thousand Oaks, CA: Sage Publication, Inc. 275 Pages, \$67.00 (Paperback).," *New Horizons in Adult Education and Human Resource Development* 31, no. 3 (2019): 75–77, <https://doi.org/10.1002/nha3.20258>.

The participants consisted of four primary school students aged seven to nine years who were at a beginner to early-intermediate level in drum learning. This age range represents an early stage of instrumental development in which motor coordination and practice behaviors are still emerging. Participants were selected through purposive sampling based on their experience engaging in practice beyond direct lesson instruction, ensuring relevance to the research focus¹³. The study was conducted in a private non-formal music school in Bandung, Indonesia, where structured instruction and independent practice occur within the same familiar learning environment.

The authors assumed the role of participant observers, acting as the drum instructors while systematically documenting students' practice behaviors. This role enabled close access to naturally occurring practice activities while maintaining observational focus on how students structured and enacted their practice during and beyond instructional moments. Data were collected through three techniques: (1) direct observation of practice sessions, (2) semi-structured interviews to explore students' perspectives on their practice processes, challenges, and strategies, and (3) document analysis of brief practice logs and instructional records to provide contextual support. The semi-structured interview format ensured consistency across participants while allowing flexibility to probe emerging responses.¹⁴

The research procedure was conducted in three stages. First, students participated in regular thirty-minute practice sessions in which moments beyond direct instruction were observed and documented. Second, follow-up interviews were conducted after practice sessions to capture students' reflections on their actions and decisions during practice. Third, supporting documents were reviewed to contextualize observed behaviors. Data analysis followed an inductive thematic approach. All data sources, including field notes, interview transcripts, and documents, were repeatedly read to become familiar with them. Initial codes were generated from observable actions and participant statements, followed by categorization through iterative comparison. Themes were then developed to represent recurring patterns in students' practice behaviors, focusing on how they structured practice, addressed technical challenges, and organized learning within the setting¹⁵.

Table 1. Overview of Participants

Student	Age
S1	7 year
S2	8 year
S3	8 year
S4	9 year

RESEARCH RESULTS AND DISCUSSION

Independent Practice Activities During Non-instructional Moments

All four students demonstrated immediate engagement upon entering the practice space, initiating drum playing without external prompting. This consistent behavior indicates that the prior instructional material was internalized as an entry point for independent practice. Across participants, the previously learned 4/4 groove served as a shared structural reference, used repeatedly before any

¹³ Marqo Patton, "Creative Efficacy Toolbox: Introducing a Professional Development Model for Creatives," *College Music Symposium*, 2021, <https://doi.org/10.18177/sym.2020.61.1.sr.11518>.

¹⁴ Jon Swain and Brendan King, "Using Informal Conversations in Qualitative Research," *International Journal of Qualitative Methods* 21 (April 24, 2022), <https://doi.org/10.1177/16094069221085056>.

¹⁵ M B Miles, A M Huberman, and J Saldana, *Qualitative Data Analysis: A Methods Sourcebook* (SAGE Publications, 2018), <https://books.google.co.id/books?id=fjh2DwAAQBAJ>.

modification or variation was introduced. This pattern was observed across all cases, suggesting that independent practice was anchored in retained instructional content rather than in spontaneous or unstructured play.

However, while structural accuracy was largely maintained, tempo stability varied across participants. Three of the four students (S1, S2, S3) demonstrated fluctuations in tempo, including both dragging and rushing, particularly during repeated execution and exploratory variation. For instance, (S1) reproduced the correct coordination pattern but exhibited gradual tempo deceleration, as reflected in his statement, *"I want to try yesterday's beat, but I will use my own tempo."* Similarly, (S2) introduced tom-based variations while maintaining the learned structure, yet his performance showed consistent tempo acceleration during these additions. In contrast, (S4) maintained a stable tempo but did not engage in variation, indicating a different orientation toward accuracy over exploration.

Variation behaviors further revealed differentiated engagement. (S2) and (S3) actively modified the learned material by incorporating tom sounds and altering rhythmic placement, while (S4) remained focused on exact reproduction. (S3), in particular, attempted to transfer the learned groove across different drum components but experienced a coordination breakdown, as indicated by misalignment among the hi-hat, snare, and bass drum. These variations demonstrate that independent practice involved both consolidation and exploratory extension, although not all students engaged in both processes equally.

Overall, the findings indicate that independent practice was not random but structured around prior learning, with observable patterns of repetition, variation, and instability in tempo. The persistence of structural coherence despite technical inconsistency suggests that students retained conceptual understanding of the groove while still developing motor control and temporal regulation.

Technical Problem-Solving in Drum Practice

Across all participants, the primary technical difficulty involved coordination between the hi-hat and bass drum. Although students maintained the groove's general structure, synchronization between limbs frequently disrupted the tempo's stability. Observations showed that the hi-hat pattern was often executed consistently, while the bass drum placement shifted slightly ahead of or behind the beat, resulting in dragging or rushing.

In response to these difficulties, students consistently adopted a global repetition strategy rather than isolating problematic segments. Instead of separating limb coordination into smaller units, they repeated the entire groove multiple times in an attempt to regain temporal alignment. This approach was evident across all four participants and was particularly visible when tempo instability increased during repeated cycles. In several instances, tempo drift intensified before stabilizing, suggesting that correction was attempted by continuation rather than by analytical adjustment.

The authors occasionally provided external auditory cues, such as clapping or synchronized stick strikes, to support realignment of tempo. This intervention functioned as a temporary external reference rather than a direct instruction of content. Importantly, students resumed independent control immediately after alignment was restored, suggesting that these cues served as scaffolding rather than as guided instruction. This distinction clarifies that practice remained predominantly self-directed despite momentary external support.

Further challenges were observed during transitions between groove and fill patterns. Students frequently paused after attempting fills and restarted the full pattern rather than isolating transition points. This behavior reinforces the dominance of whole-pattern repetition as the primary strategy for problem-solving. Despite these challenges, all participants remained actively engaged, frequently attempting variations and requesting confirmation of rhythmic accuracy, indicating awareness of performance discrepancies and intention to correct them.

Structuring Practice Within the Learning Setting

Lessons were designed to last about 30 minutes, in accordance with industry standards in the private music teaching industry. All four students had full 30-minute sessions, with no students showing so much fatigue or disengagement that the practice time needed to be shortened. In fact, several students commented that the allotted time was too short, especially when they were engaged in free play. The time constraint was not due to diminished interest in playing, but rather in response to the external scheduling demands of subsequent activities students had to attend after the lesson. This consistency in session duration created a stable context in which practice-organizational differences became apparent.

While all lessons were the same length, students exhibited different internal structures of practice. Two major entry patterns were noted. Some students started with sticking rudiments, sometimes using the electronic drum's metronome, while others started playing without a metronome and informally synced with the teacher. Another differentiated practice approach was observed in students who began groove playing. For these students, playing beat patterns served as a functional warm-up. Instead of rehearsing isolated technical exercises, they emphasized coordination through a continuous execution of groove patterns. In many instances, this warm-up phase included three to four songs played back-to-back or in a medley, providing a relevant combination of expressive and technical focus to sustain the mobility of their hands and feet before narrowing the focus on specific instructional objectives.

Though entry routines varied, there was a common behavioral pattern among the four students. All four students started from the hi hat. They did not count in verbally; instead, they started with a hi-hat pulse and gradually built the groove. Once the groove was established, students focused on integrating the snare and bass drum with the hi hat. They incrementally locked into the groove before trying to fill in the rest of the groove. Students focused on making the groove feel good before playing along to backing tracks or a minus-one recording to fill it in. At this point, some students used the notation from the curriculum guide, demonstrating the use of a written guide as a reference integrated into their practice process.

The room's design facilitated the organization of practice. For example, the design enabled the instructor's ability to see the hands, posture, and coordination of the limbs of the drummer. This front-facing setup was likely to enhance the drummer's ability to pay attention without disrupting the drummer's need to engage independently. During the practice, there were no outside distractions. The students' attention and enthusiasm did not waver throughout the entire thirty-minute session. In this practice setting, it was possible to structure things so that the session was fully completed with individual entry routines, a systematic progression from hi-hat to full groove, the use of backing tracks and written music, and all of this was arranged to keep students engaged



Figure 1. On-site Drum Practice Session Within the Learning Setting



Figure 2. Drum Practice Configuration Within the Learning Setting

Table 2. Observed Practice Structure Within the Thirty-Minute Session

Aspect	Observed Pattern Across Students
Session duration	Thirty minutes per student, no early termination
Entry routine	Rudiments with or without a metronome, or immediate groove playing
Warm-up approach	Groove-based repetition; multiple songs or medley playing
Starting point	Always initiated from the hi-hat pulse.
Groove development	Gradual layering from hi-hat to full coordination
Use of resources	Backing tracks, minus one recording, written notation
Room influence	Face-to-face positioning supported focus and visual reference.
Engagement level	Students demonstrated continuous focus throughout the session.

DISCUSSION

The data show that practice conducted outside direct teaching sessions was rooted in previously acquired knowledge. Each student consistently began their detached practice with the 4/4 groove taught in earlier lessons, before elaborating on it with variations or other exploratory additions. This suggests that earlier teaching served as a motoric and rhythmic scaffolding in self-directed practice. Literature on practice strategies in music has identified the structured repetition of previously mastered pieces as a driving force in the consolidation of procedural learning and strengthening motor memory¹⁶. This repetition should be understood as a functional strategy for

¹⁶ Elodie Martin, Claire Scotté-Barranoff, and Jessica Tallet, “What Neurological Diseases Tell Us about Procedural Perceptual-Motor Learning? A Systematic Review of the Literature,” *Neurological Sciences* 44, no. 8 (August 28, 2023): 2645–65, <https://doi.org/10.1007/s10072-023-06724-w>; Megan Lam, “The Physicality of Music Production:

stabilizing motor patterns rather than a purely mechanical habit, but as a reliance on internalized rhythmic patterns, which are used as a firm launching pad for further developments. This finding aligns with research suggesting that repeated engagement with familiar material supports procedural consolidation in early instrumental learning¹⁷.

The main technical issue was coordinating the hi-hat and bass drum. This influenced the tempo's stability. The tendency to drag and rush the tempo indicated that the ability to regulate time internally was still developing, especially under increased motor demand. Previous studies indicate that coordinating multiple limbs in percussion performance requires advanced integration of motor control and temporal regulation.¹⁸ It is noteworthy that despite the tempo's instability, the rhythmic pattern's integrity remained intact. This shows that the precise control over the tempo was transitioning while the understanding of the groove's rhythmic structure was developing. This pattern reflects a developmental stage in which rhythmic representation precedes precise motor execution. Such a global approach to problem-solving is opposed to the analytical segmentation strategies that are typical of more advanced learners¹⁹.

The strategies students use to solve problems indicate a particular approach. Instead of breaking down a particular segment they find technically tricky, students seemed to pause briefly, then play the entire groove from the start. Such a global approach to problem-solving contrasts with the analytical segmentation strategies typical of more advanced learners. Research from the early stages of instrumental learning indicates that younger students are more likely to use whole-pattern repetition and less likely to use systematic sectional practice strategies²⁰. Regardless of the use of a global approach to problem-solving, none of the participants showed signs of avoidance behavior. Instead, students showed great effort in implementing the changes, and many of them creatively reintroduced them after making mistakes. This behavior indicates emerging self-regulatory engagement, although it is not yet supported by systematic practice strategies, and the approach remains underdeveloped.

The way practice was organized in the thirty-minute session showed implicit structuring. Students created the groove from scratch in layers, starting with the hi-hat pulse, then gradually added the snare and bass drum in coordination, before moving on to the complete execution of the groove. This type of incremental layering is supported by the practice strategy literature, which proposes that

Investigating the Roles of Mindful Practice and Kinesthetic Learning,” *Music Educators Journal* 106, no. 3 (March 18, 2020): 23–28, <https://doi.org/10.1177/0027432119895553>; Marília Nunes-Silva et al., “Sensory Feedback in Music Performer–Instrument Interactions,” *Psychology of Music* 49, no. 5 (September 22, 2021): 1285–1302, <https://doi.org/10.1177/0305735620928397>.

¹⁷ Yiren Ren and Thackery I. Brown, “Beyond the Ears: A Review Exploring the Interconnected Brain behind the Hierarchical Memory of Music,” *Psychonomic Bulletin and Review* 31, no. 2 (2024): 507–30, <https://doi.org/10.3758/s13423-023-02376-1>.

¹⁸ Kathryn Kreidler, Janet Vuolo, and Lisa Goffman, “Children With Developmental Language Disorder Show Deficits in the Production of Musical Rhythmic Groupings,” *Journal of Speech, Language, and Hearing Research* 66, no. 11 (November 9, 2023): 4481–96, https://doi.org/10.1044/2023_JSLHR-23-00197; Martin Clayton et al., “Interpersonal Entrainment in Music Performance,” *Music Perception* 38, no. 2 (November 25, 2020): 136–94, <https://doi.org/10.1525/mp.2020.38.2.136>; James Brooks et al., “Spontaneous Rhythmic and Tool-Assisted Drumming across Variable Tempo and Technique in a Captive Chimpanzee,” September 26, 2025, <https://doi.org/10.1101/2025.09.26.678729>.

¹⁹ Ali Rajabi Mashhadi et al., “Neural Encoding of Auditory Rhythm beyond Cortical Auditory Areas before the Age of Term,” *IScience* 28, no. 9 (September 2025): 113028, <https://doi.org/10.1016/j.isci.2025.113028>.

²⁰ Shuchen Wu, Mirko Thalmann, and Eric Schulz, “Two Types of Motifs Enhance Human Recall and Generalization of Long Sequences,” *Communications Psychology* 3, no. 1 (January 7, 2025): 3, <https://doi.org/10.1038/s44271-024-00180-8>.

the simpler components must be stabilized before full integration is achieved²¹. Although students did not explicitly articulate this approach, their behavior generally indicated a practice of the method to aid the technical consolidation. From this, it can be concluded that early-stage drum learners do not practice in an unstructured manner. It could be argued that their self-directed practice demonstrates a combination of consistent repetition, structured practice, and focused practice on problem-solving and creative variation within the limits of their developing motor skills and temporal control.

CONCLUSION

This study examined how primary school students engaged in drum practice during moments without direct instructional guidance within a non-formal learning setting. The findings indicate that practice was consistently structured around previously learned rhythmic material, suggesting that instructional input was retained and actively re-applied during independent engagement. While tempo instability and coordination challenges between the hi-hat and bass drum were frequently observed, students maintained the overall structural coherence of the groove, reflecting emerging motor control rather than fully stabilized performance. Problem-solving strategies were predominantly global, with students relying on repeating complete patterns rather than on analytical segmentation, indicating an early stage of strategic development. Practice behaviors also showed implicit organization, typically beginning with hi-hat stabilization before progressing toward full groove integration, supported by the spatial and auditory conditions of the learning environment. These findings contribute to a more nuanced understanding of how early-stage drum learners organize practice within instructional contexts, highlighting the interplay between repetition, coordination challenges, and exploratory behavior. However, the study is limited by its small sample size, a single non-formal setting, and a short observation period in a dual teacher-researcher role, which restricts broader generalization. Future research involving larger and more diverse participant groups, as well as longitudinal designs, is needed to examine further the development of practice strategies in early instrumental learning.

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²¹ Chen-Gia Tsai, "Predictive Processing within Music Form: Analysis of Uncertainty and Surprise in Different Sections of Sonata Form," *Music & Science* 7 (January 16, 2024), <https://doi.org/10.1177/20592043241267076>; Xueqing Huang, Na Long, and Xiaolei Yang, "Novel Nonlinearity Extracting Method of Diverse Music Signals Based on Chaotic Techniques for Musical Processing System," *Computational Intelligence* 41, no. 5 (October 11, 2025), <https://doi.org/10.1111/coin.70138>.

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