



Reconsidering the Drill Method in Music Education: Pedagogical Perspectives and Learning Outcomes

Piter Sembiring¹, Yudi Sukmayadi², Sandie Gunara³

Art Education, Postgraduate School, Universitas Pendidikan Indonesia^{1,2,3}

piter.sembiring06@gmail.com, yudi.sukmayadi@upi.edu, sandiegunara@upi.edu

Diterima: 30-12-2025

Review: 22-04-2026

Publish: 30-04-2026

Abstrak

Metode drill telah lama digunakan dalam pendidikan musik, namun relevansi pedagogisnya masih diperdebatkan karena sering dikaitkan dengan pengulangan mekanis dan keterbatasan pemaknaan musikal. Penelitian ini bertujuan untuk meninjau kembali peran metode drill dalam pembelajaran musik dengan mensintesis perspektif pedagogis, praktik pembelajaran, serta hasil belajar yang dilaporkan dalam literatur ilmiah. Penelitian ini menggunakan desain studi pustaka kualitatif yang melibatkan penelusuran basis data secara sistematis, seleksi studi berdasarkan kriteria inklusi yang telah ditetapkan, serta analisis tematik terhadap studi terpilih. Data dianalisis menggunakan kerangka analitis terstruktur melalui proses pengkodean, kategorisasi, dan perbandingan lintas studi untuk mengidentifikasi pola pedagogis yang berulang dan hasil belajar yang dilaporkan. Hasil kajian menunjukkan bahwa praktik berbasis drill secara konsisten mendukung stabilitas teknik, akurasi musikal, literasi notasi, serta konsistensi performa dalam berbagai konteks pendidikan. Namun, efektivitasnya sangat bergantung pada desain pembelajaran dan integrasi pedagogis. Metode drill berkontribusi terhadap perkembangan musikal yang bermakna ketika diselaraskan dengan tujuan yang jelas, bimbingan terarah, dan keterlibatan interpretatif, tetapi menjadi terbatas apabila diterapkan sebagai pengulangan yang terpisah dari konteks musikal. Penelitian ini menempatkan metode drill sebagai strategi pedagogis dasar yang mendukung perkembangan pembelajaran musik secara bertahap, bukan sekadar metode mekanis.

Kata kunci: Metode Drill, Pendidikan Musik, Keterampilan Musikal, Strategi Latihan

Abstract

The drill method has long been employed in music education, yet its pedagogical relevance remains debated due to its association with mechanical repetition and limited musical meaning. This study aims to re-examine the role of the drill method in music learning by synthesising pedagogical perspectives, instructional practices, and reported learning outcomes within existing scholarly literature. A qualitative literature review design was employed, involving systematic database searching, study selection based on predefined inclusion criteria, and thematic analysis of selected studies. Data were analysed using a structured analytical framework through coding, categorisation, and cross-study comparison to identify recurring pedagogical patterns and reported learning outcomes. The reviewed studies indicate that drill-based practice consistently supports technical stability, musical accuracy, notation literacy, and performance consistency across diverse educational contexts. However, its effectiveness is strongly dependent on instructional design and pedagogical integration. Drill contributes to meaningful musical development when aligned with clear objectives, guided feedback, and interpretative engagement, but becomes limited when applied as isolated repetition. This study positions drill as a foundational pedagogical strategy that supports progressive musical learning rather than as a purely mechanical method.

Keywords: *Drill Method, Music Education, Musical Skills, Practice Strategies*

Copyright © 2026 Piter Sembiring¹, Yudi Sukmayadi², Sandie Gunara³

This work is licensed under a [Creative Commons Attribution-ShareAlike 4.0 International License](https://creativecommons.org/licenses/by-sa/4.0/)



INTRODUCTION

The significance of practice in music education, especially in achieving instrumental mastery and dependable performance, cannot be overstated (Acquilino & Scavone, 2022; Yokuş, 2020). Various pedagogical frameworks endorse practice as a vital component in developing learners' technical mastery, motor skills, and timing (Krigolson et al., 2021; Walsh et al., 2023).

Consequently, the drill method, which advocates for the repetitive and structured reinforcement of particular skills, as proposed, for example, in practice Anggoro (2021) and Pangesti & Wadiyo (2021), has emerged as one of the longest-standing teaching methods in music. The apparent success of drill methods in teaching music has been reported in studies that document its effectiveness in aiding the development of basic skills, particularly during the early and intermediate phases of the learners' musical growth (Gülle et al., 2021; Mendrofa & Wijaya, 2022).

Use of drill to stabilize a technique, to increase fluency, and to decrease errors in performance is a common aspect of formal music education. In instrumental pedagogy, repetitive practice is suggested to assist in the processes of automation that afford learners the ability to reassign cognitive resources to the more expressive and interpretative dimensions of the music-making process (Ayderova et al., 2021; Nusseck & Spahn, 2021). In the same way, research in motor learning indicates that the process of repetition assists in the consolidation of sensorimotor patterns that are necessary to the accurate performance of music (Herszage et al., 2021; Mackay et al., 2021; Nunes-Silva et al., 2024; Smith et al., 2021). These studies have strengthened the belief that drill is a useful method to obtain greater levels of consistency and accuracy in musical performance.

The use of the drill method has not only been around for a long time but has also sparked long standing pedagogical debates. Some critique the method arguing that practicing music in a detached manner from contextual/practical awareness can lead to a loss of musical understanding, lower emotional investment from the learners, and limit creative exploration (Bautista et al., 2024). Some critics emphasize the focus of contemporary music education as aiming for, and enabling, the learners the possibility of self-directed and creative emotional expression. Because of this focus, use of the drills method has been perceived as outdated and mechanistic (Scarlato & Kim, 2026; Thompson-Bell, 2023). Because of these polar views, the use of drills poses significant challenges to achieving deeper musical exploration while also providing a foundation for necessary mastery of technical skills.

Nevertheless, some of the most recent works show both empirical and conceptual studies examining drill not as a rigid and isolated practice strategy, but as a productive component within some other larger frameworks. Repetition has been shown to aid in the attainment of various psychosocial goals and technical goals when it is combined with purposeful tasks, reflective feedback, and the concept of drill and practice (Hermassi et al., 2020; Pflipsen et al., 2021). These studies point to the idea that the value of educator drill hinges on how it is contextualized rather than on the presence of repetition, which is a value in and of itself.

The scholarship on practice strategies in music education is increasing; however, the reviews available seem to concentrate on general practice behaviours, deliberate practice

frameworks, or self-regulated learning, with little focus on the drill method as a pedagogical idea (Chen, 2024; Hidayatullah, 2023). Consequently, the discussion of drill within current music pedagogy has been left in a sort of limbo, often implicitly referred to, but not examined in detail or systematically. This has led to the different ways drill has been interpreted, practiced, and assessed in various educational settings.

In this case, synthesizing available literature on the drill method will help in clarifying the method's pedagogy, educational purpose, and the learning outcomes associated with it. It is hoped that by addressing the conceptualization, critique, and contextualization of drill in music education research, it will provide a better understanding of the method's place in current educational theory. The focus of this study is not to support or oppose the use of drill in teaching. It is my intention to examine drill as a teaching technique, the success of which is contingent upon the design of the instruction, the context, the musical, and the active participation of the learners.

Thus, this literature review aims to critically examine how the drill method has been conceptualised, implemented, and evaluated within music education research, with particular attention to pedagogical approaches and reported learning outcomes. Rather than relying on primary field data, this study draws on documented evidence from empirical and conceptual studies to identify patterns of instructional practice, forms of data analysis employed in prior research, and the resulting learning outcomes associated with drill-based instruction. Through this approach, the study contributes to the discourse by providing an analytically grounded synthesis of how drill functions within contemporary music pedagogy.

METHOD

Research Design

This study employed a qualitative literature review design to systematically examine the role of the drill method in music education. The design focuses on synthesising both empirical findings and conceptual discussions to identify pedagogical patterns, instructional approaches, and learning outcomes reported in the literature. This approach enables a structured interpretation of existing research without generating primary field data (Grigg, 2021; Wunseh, 2023). In this case, it facilitated an examination of the conceptualization, application, and evaluation of the drill method within given teaching and learning contexts in music education.

Data Collection Technique

Data collection was conducted through a systematic and structured search of peer-reviewed literature related to drill-based learning in music education. The search process was carried out across major academic databases, including Scopus, SINTA, and Google Scholar, to ensure comprehensive coverage of relevant studies.

A combination of keywords and search strings was employed to capture variations in terminology associated with the drill method, including “drill method”, “repetitive practice”, “practice routines”, “instrumental practice”, and “music learning”. Boolean operators (AND, OR) were used to refine the search and increase the relevance of retrieved studies. The selection process followed a staged procedure, including identification, screening, eligibility assessment, and final inclusion. Titles and abstracts were first reviewed to determine relevance, followed by full-text evaluation based on predefined inclusion and exclusion criteria.

To ensure consistency in data extraction, each selected study was documented using a structured data extraction matrix. This matrix functioned as a guiding instrument during the collection process and included key information such as study focus, instructional

context, methodological approach, and reported learning outcomes related to drill-based practice.

Inclusion and Exclusion Criteria

The selection of literature was guided by explicit inclusion and exclusion criteria to ensure relevance and analytical focus. Studies were included if they (1) were published in peer-reviewed journals, conference proceedings, or scholarly books; (2) explicitly addressed the drill method, repetitive practice, or structured practice within music education contexts; and (3) reported pedagogical approaches, instructional processes, or learning outcomes. Studies were excluded if they (1) discussed drill or repetition outside music education; (2) lacked clear pedagogical relevance; or (3) did not report identifiable learning outcomes or instructional implications. These criteria ensured that only relevant and academically rigorous studies were included in the analysis.

Measurement Framework

To address the analytical objectives of this study, a structured analytical framework was employed as the primary instrument for data extraction and interpretation. Rather than using a conventional measurement tool, this study utilised a set of analytical indicators derived from music pedagogy literature to examine how the drill method is conceptualised and implemented across studies.

The framework consisted of four key dimensions:

- I. Technical development, including motor skills, coordination, and accuracy;
- II. Musical literacy, including notation reading and conceptual understanding;
- III. Instructional context, including formal, nonformal, and training environments; and
- IV. Reported learning outcomes, including performance improvement, consistency, and learner progression.

These dimensions functioned as analytical instruments to systematically identify, compare, and interpret findings across the reviewed studies. Each selected article was examined using these indicators to ensure consistency in data extraction and to enable a structured synthesis of evidence.

Data Analysis Technique

The literature related to the drill method was subjected to thematic analysis to assist in the identification of recurring themes, pedagogical positions, and drawn learning outcomes related to the drill method. This analysis was completed using an iterative method and involved an analysis of the literature through the processes of close reading, coding and categorisation. The literature was initially coded based on how drill was defined and situated within the context of music pedagogy and subsequently categorised in relation to themes linked to the instructional purpose, learning processes and outcomes.

Patterns and discrepancies among the various studies and literature were documented, which in turn facilitated the integration of various perspectives on the pedagogical function of drill practice. In qualitative research, thematic analysis is often utilized to provide a methodical approach to the measurement of text in order to provide structure to a set of attained meaning which is reflected within a particular research context (Banaser et al., 2021; Stumbar et al., 2020).

RESULT AND DISCUSSION

Drill and the Development of Technical Stability in Music Learning

The analysis of the selected studies, based on the structured data extraction matrix and analytical framework, indicates that drill-based practice consistently contributes to the

development of technical stability in music learning. Across the reviewed literature, evidence derived from performance assessments, observational reports, and documented learning progress demonstrates that repetitive and structured exercises lead to measurable improvements in motor coordination, accuracy, and rhythmic control.

Studies on instrumental learning, particularly in keyboard, guitar, and recorder instruction, report that drill-based practice contributes to improvements in finger precision, hand coordination, tempo control, and rhythmic stability, as evidenced by performance evaluations and observed learning progress (Irvani & Nugroho, 2023; Suwari et al., 2024).

Similarly, studies focusing on less familiar instruments, such as Polopalo, reveal that drill-based instruction supports the gradual development of rhythmic sensitivity and technical control. The reported outcomes in these studies, obtained through instructional observations and performance-based evaluations, indicate that repetition enables learners to internalise motor patterns more effectively compared to demonstration-based approaches alone (Dai et al., 2024).

From an analytical perspective, these results confirm that drill functions as a mechanism for reinforcing sensorimotor coordination and reducing performance variability. The consistency of these findings across multiple studies strengthens the interpretation that drill-based practice contributes to technical stability when implemented in a structured and progressive manner.

The consistency of findings across the reviewed studies supports the widely recognised role of repetition in facilitating the acquisition of advanced motor skills in music learning. Furthermore, drill-based practice is described as a strategy for reducing cognitive load associated with technical execution, allowing learners to allocate greater attention to higher-level musical elements during the learning process (Hayward et al., 2024; T. Zaatari et al., 2024).

Drill, Musical Literacy, and Learning Outcomes

Apart from developing performance-related skills, the drill method also strengthens musical literacy and enhances student learning outcomes. Reviewed studies suggest that primary and secondary learners develop a stronger comprehension of musical symbols, pitch patterns, and the correlation between musical representation and performance through repetitive and structured practice (Yuwono et al., 2025).

Drill is reported in the reviewed studies as a key instructional approach for strengthening the association between written notation and musical performance, as evidenced by reductions in reading errors and improvements in accuracy. Studies on notation learning indicate that repeated practice of specific notation patterns reduces reading errors, improves performance accuracy, and accelerates symbol recognition (Silaban et al., 2024).

The reinforcement of musical concepts like scales, intervals and harmony is an additional benefit of drill-based instruction. In the instruction of manual harmony and music theory, the repeated exercises help learners build their understanding, which allows them to easily apply abstract concepts in a practical way (Ramafisela, 2023).

The effect of enhanced musical literacy from drill is mirrored in improved learning outcomes. Multiple studies report measurable improvements in learning outcomes, including increased accuracy in performance, attainment of minimum competency standards, and enhanced overall musical performance quality following the implementation of drill-based instruction (Hanifah & Patriasurya Azhar, 2023; Njau, 2013).

Studies on ensemble and choral learning report that drill-based practice improves rhythmic accuracy, inter-player coordination, and tempo stability, as evidenced by performance evaluations and observed improvements in group synchronisation (Setiawan,

2025; Thasya & Putra, 2024). Studies on accompaniment learning report that drill-based practice improves control over harmonic patterns, stability of accompaniment structures, and coordination between hands, as evidenced by performance assessments and increased learner fluency (Astuti & Harto, 2021; Valeska et al., 2025).

The reviewed studies consistently demonstrate that drill-based instruction contributes to both the reinforcement of musical literacy and the improvement of learning outcomes, as evidenced by reported gains in notation accuracy, performance quality, and task completion across multiple learning contexts. However, such effectiveness is contingent upon the setting of meaningful instructional aims, whereby drill is executed as purposeful, musically meaningful practice, as opposed to simply a repetition exercise.

Drill in Formal, Nonformal, and Training Contexts

The literature reviewed in this study indicates that the drill method is utilised across multiple educational settings, encompassing formal classroom instruction, nonformal learning environments, and teacher training programmes. Within formal music education, drill-based practice is typically integrated into structured instructional frameworks where learning objectives, instructional sequencing, and assessment procedures are explicitly articulated. In such contexts, drill supports the gradual development of technical precision, fluency in notation, and performance consistency, particularly during the early and intermediate phases of musical learning (Ramafisela, 2024; Rasmini, 2020). The regulated nature of formal instruction enables drill to be systematically aligned with curricular expectations, reinforcing its role as a foundational pedagogical mechanism rather than a purely mechanical exercise.

In nonformal and extracurricular settings, the implementation of drill tends to be more adaptive, responding to constraints such as limited instructional time, heterogeneous learner backgrounds, and practice-oriented learning goals. Research conducted in extracurricular music contexts demonstrates that repetitive practice remains effective in strengthening technical control, rhythmic accuracy, and ensemble coordination, even when learning occurs outside standard classroom structures. This is particularly evident in studies focusing on traditional music and accompaniment activities, where drill facilitates skill consolidation within flexible learning arrangements (Puspa & Irdhan Epria Darma Putra, 2023; Sulistyono et al., 2021). These findings suggest that the pedagogical value of drill lies in its capacity to organise practice efficiently rather than in rigid repetition detached from musical purpose.

The application of drill in teacher training contexts further underscores its practical significance. In professional development initiatives, drill is often introduced as an instructional strategy that can be readily adopted by educators with varying levels of musical expertise. This characteristic is especially relevant in educational settings where access to specialised musical resources or formal performance training is limited. Drill provides teachers with a clear and manageable framework for structuring student practice, thereby supporting instructional consistency and pedagogical confidence (Usman, 2020). Research similarly highlights the importance of structured practice strategies in enhancing teachers' instructional clarity and decision-making in music education (Janurik & Józsa, 2022).

Across formal, nonformal, and training contexts, the literature consistently emphasises that the effectiveness of drill is closely tied to its pedagogical framing. Drill-based practice yields meaningful outcomes when it is accompanied by clearly defined musical objectives, responsive feedback, and opportunities for reflective engagement. Conversely, uniform application of drill without consideration of contextual factors or learner characteristics may limit its educational impact. This observation resonates with

broader discussions in music pedagogy that advocate for context-sensitive instructional strategies aligned with specific learning environments and musical aims (Barton & Riddle, 2022; Holochwost et al., 2021; Mullen & Luna, 2025).

Collectively, the analysed studies indicate that the drill method functions as a context-responsive pedagogical tool, as evidenced by its consistent application and reported effectiveness across formal, nonformal, and training environments. Its successful implementation across diverse educational settings depends on deliberate instructional design, informed teacher mediation, and alignment with overarching musical learning goals. Viewed in this way, drill functions not as a rigid instructional formula, but as a flexible yet structured practice strategy capable of supporting varied forms of music education when applied with pedagogical intent.

Limitations of Drill and Long-Term Pedagogical Implications

Despite its demonstrated effectiveness, several studies and supporting literature highlight limitations of the drill method when it is applied dominantly without broader pedagogical integration. Drill practices that focus excessively on technical repetition tend to prioritise procedural accuracy at the expense of affective engagement and musical meaning-making processes, potentially reducing students' expressive awareness and interpretative involvement (Gumm, 2023). However, cross-study findings consistently indicate that these limitations are not inherent to the drill method itself, but rather arise from the manner and instructional context in which it is implemented. When drill is positioned as an initial foundation that supports interpretative and expressive learning, it strengthens learners' musical readiness and capacity for more advanced musical engagement (Lici, 2023).

Another limitation identified across the reviewed studies concerns the strong emphasis on short-term learning outcomes, as most studies report immediate improvements in technical accuracy and performance consistency without providing longitudinal evidence of skill retention or transferability (Grau-Sánchez et al., 2022; Shen et al., 2020). Consequently, the sustained developmental impact of drill-based practice beyond foundational skill acquisition remains underexplored.

The scope of instructional contexts represented in existing studies also constrains the generalisability of findings. Research tends to focus on basic instrumental learning, notation reading, traditional music practice, and extracurricular activities, with relatively limited attention to advanced musical domains such as composition, improvisation, and higher music education, where cognitive and creative demands are more complex (Stijnen et al., 2024; Yu, 2023). In addition, learner-related variables such as motivation, prior musical experience, and affective responses to repetitive practice are rarely examined systematically. Given that practice behaviours and learning outcomes are closely linked to motivational and self-regulatory factors, the limited attention to these variables restricts a comprehensive understanding of how different learners engage with drill-based instruction (Fong et al., 2024; Warni et al., 2024).

CONCLUSION

This review confirms that the drill method remains a pedagogically valid approach in music education when employed as a foundational practice rather than an end in itself. Across formal, nonformal, and extracurricular contexts, drill-based learning consistently supports technical stability, musical accuracy, notation literacy, and performance reliability, contributing to improved learning outcomes. The findings further indicate that the effectiveness of drill depends on its instructional integration; mechanical repetition without musical context limits its educational value, whereas structured repetition embedded within

clear musical goals enhances meaningful learning. Accordingly, drill should be positioned as a preparatory pedagogical strategy that enables higher-level musical engagement. It is recommended that educators integrate drill with interpretative, reflective, and expressive dimensions of music learning, while future research should examine how drill-based practices interact with creative and learner-centred approaches across diverse educational settings.

REFERENCES

- Acquillino, A., & Scavone, G. (2022). Current State and Future Directions of Technologies for Music Instrument Pedagogy. *Frontiers in Psychology*, 13. <https://doi.org/10.3389/fpsyg.2022.835609>
- Anggoro, R. R. M. K. M. (2021). Optimalisasi Kompetensi Primavista Mahasiswa Instrumen Pokok Piano Melalui Metode Drill. *Virtuoso: Jurnal Pengkajian Dan Penciptaan Musik*, 4(1), 70. <https://doi.org/10.26740/vt.v4n1.p70-81>
- Astuti, H. F., & Harto, T. R. P. (2021). Penerapan Metode Drill Pada Keyboard Untuk Meningkatkan Kemampuan Iringan Dalam Kegiatan Ekstrakurikuler Di Sdn 1 Citalang Purwakarta. *SWARA - Jurnal Antologi Pendidikan Musik*, 1(1), 10–15. <https://doi.org/10.17509/swara.v1i1.32930>
- Ayderova, V., Wong, H. Y. @ C., & Augustine, C. (2021). Music Notation Software as a Visual-aural Model in Self-regulated Practice. *International Journal of Academic Research in Business and Social Sciences*, 11(12). <https://doi.org/10.6007/IJARBS/v11-i12/11268>
- Banaser, M., Al-Soqair, N., & Al-Feher, S. (2021). Nurses Perception of Advance Nurse Practitioners Roles in Public Hospitals: A Qualitative Study. *Open Journal of Nursing*, 11(06), 513–527. <https://doi.org/10.4236/ojn.2021.116044>
- Barton, G., & Riddle, S. (2022). Culturally responsive and meaningful music education: Multimodality, meaning-making, and communication in diverse learning contexts. *Research Studies in Music Education*, 44(2), 345–362. <https://doi.org/10.1177/1321103X211009323>
- Bautista, A., Yeung, J., McLaren, M. L., & Ilari, B. (2024). Music in early childhood teacher education: raising awareness of a worrisome reality and proposing strategies to move forward. *Arts Education Policy Review*, 125(3), 139–149. <https://doi.org/10.1080/10632913.2022.2043969>
- Chen, Y. (2024). Effective Strategies and Methods to Enhance Music Practical Teaching in Higher Vocational Preschool Education. *Pacific International Journal*, 7(1), 162–167. <https://doi.org/10.55014/pij.v7i1.545>
- Dai, Y., Karlan, L., & Pulukadang, M. A. (2024). Pembelajaran Memainkan Alat Musik Polopalo melalui Metode Drill pada Siswa Kelas VIII Di SMP Negeri 1 Tilamuta. *Jurnal Pendidikan Dan Pembelajaran Indonesia (JPPI)*, 4(4), 1678–1684. <https://doi.org/10.53299/jppi.v4i4.817>
- Fong, C. J., Altan, S., Gonzales, C., Kirmizi, M., Adelugba, S. F., & Kim, Y. (2024). Stay motivated and carry on: A meta-analytic investigation of motivational regulation strategies and academic achievement, motivation, and self-regulation correlates.

Journal of Educational Psychology, 116(6), 997–1018.
<https://doi.org/10.1037/edu0000886>

- Grau-Sánchez, J., Jamey, K., Paraskevopoulos, E., Dalla Bella, S., Gold, C., Schlaug, G., Belleville, S., Rodríguez-Fornells, A., Hackney, M. E., & Särkämö, T. (2022). Putting music to trial: Consensus on key methodological challenges investigating music-based rehabilitation. *Annals of the New York Academy of Sciences*, 1518(1), 12–24. <https://doi.org/10.1111/nyas.14892>
- Grigg, R. (2021). EntreCompEdu, a professional development framework for entrepreneurial education. *Education + Training*, 63(7/8), 1058–1072. <https://doi.org/10.1108/ET-06-2020-0166>
- Gülle, A., Akay, C., & Uzun, N. B. (2021). Zoltán Kodály gives a hand to secondary school students in recorder performance and attitudes toward music in Turkey. *International Journal of Music Education*, 39(4), 477–491. <https://doi.org/10.1177/02557614211005904>
- Gumm, A. J. (2023). Music motivation depends on what to motivate: research review of Gumm’s music teaching and conducting models. *Frontiers in Psychology*, 14(November). <https://doi.org/10.3389/fpsyg.2023.1293872>
- Hanifah, H., & Patriasurya Azhar, A. (2023). Analisis Metode Drill dalam Pembelajaran Seni Budaya Siswa Kelas II SDN Perumnas 1. *Journal on Education*, 05(04), 13878–13883.
- Hayward, W., Buch, E. R., Norato, G., Iwane, F., Dash, D., Salamanca-Girón, R. F., Bartrum, E., Walitt, B., Nath, A., & Cohen, L. G. (2024). Procedural Motor Memory Deficits in Patients With Long-COVID. *Neurology*, 102(3). <https://doi.org/10.1212/WNL.0000000000208073>
- Hermassi, S., Sellami, M., Fieseler, G., Bouhafs, E. G., Hayes, L. D., & Schwesig, R. (2020). Differences in Body Fat, Body Mass Index, and Physical Performance of Specific Field Tests in 10-to-12-Year-Old School-Aged Team Handball Players. *Applied Sciences*, 10(24), 9022. <https://doi.org/10.3390/app10249022>
- Herszage, J., Sharon, H., & Censor, N. (2021). Reactivation-induced motor skill learning. *Proceedings of the National Academy of Sciences*, 118(23). <https://doi.org/10.1073/pnas.2102242118>
- Hidayatullah, R. (2023). Perspectives on Music Pedagogy in Informal, Performance-Based Learning. *Virtuoso: Jurnal Pengkajian Dan Penciptaan Musik*, 6(1), 57–67. <https://doi.org/10.26740/vt.v6n1.p57-67>
- Holochwost, S. J., Bose, J. H., Stuk, E., Brown, E. D., Anderson, K. E., & Wolf, D. P. (2021). Planting the Seeds: Orchestral Music Education as a Context for Fostering Growth Mindsets. *Frontiers in Psychology*, 11. <https://doi.org/10.3389/fpsyg.2020.586749>
- Irvani, D. I., & Nugroho, A. E. (2023). Implementasi Metode Drill dalam Pembelajaran Ekstrakurikuler Gitar SMK Negeri 11 Semarang. *Clef: Jurnal Musik Dan Pendidikan Musik*, 4(2), 116–134. <https://doi.org/10.51667/cjmpm.v4i2.1487>
- Janurik, M., & Józsa, K. (2022). Long-Term Impacts of Early Musical Abilities on Academic Achievement: A Longitudinal Study. *Journal of Intelligence*, 10(3), 36.

<https://doi.org/10.3390/jintelligence10030036>

- Krigolson, O. E., Ferguson, T. D., Colino, F. L., & Binsted, G. (2021). Distribution of Practice Combined with Observational Learning Has Time Dependent Effects on Motor Skill Acquisition. *Perceptual and Motor Skills*, 128(2), 885–899. <https://doi.org/10.1177/0031512520981242>
- Lici, E. (2023). Music education in first half of 20th century in Albania: Its institution and contribution to urban music life. *Rast Muzikoloji Dergisi*, 11(2), 327–340. <https://doi.org/10.12975/rastmd.20231129>
- Mackay, C. P., Brauer, S. G., Kuys, S. S., Schaumberg, M. A., & Leow, L.-A. (2021). The acute effects of aerobic exercise on sensorimotor adaptation in chronic stroke. *Restorative Neurology and Neuroscience*, 39(5), 367–377. <https://doi.org/10.3233/RNN-211175>
- Mendrofa, M., & Wijaya, M. (2022). Benefits of Drilling Repetition in Enhancing Second Language Learners' Speaking Ability. *International Journal of English and Applied Linguistics (IJEAL)*, 2(2), 263–270. <https://doi.org/10.47709/ijeal.v2i2.1583>
- Mullen, J., & Luna, R. (2025). Toward an Anti-Racist Music Education: A Critical Pedagogy of Popular Music Teacher Education. *Journal of Music Teacher Education*, 34(3), 84–98. <https://doi.org/10.1177/10570837241295759>
- Njau, R. (2013). Penerapan Metode Drill Dalam Pembelajaran Seni Musik Di Kelas Xi IPA SMA Negeri 1 Tanjung Selor Kabupaten Bulungan Kalimantan Timur. *Jurnal Ilmiah Bahasa, Sastra, Dan Pengajarannya*, 2(1), 1–20. <https://doi.org/https://doi.org/10.26740/jps.v2n1.p1-20>
- Nunes-Silva, M., Salomé, G., Gonçalves, F. L., Braun Janzen, T., & Zendel, B. R. (2024). Effects of altered sensory feedback on piano performance errors: An exploratory study. *Research Studies in Music Education*, 46(3), 456–473. <https://doi.org/10.1177/1321103X241241192>
- Nusseck, M., & Spahn, C. (2021). Musical Practice in Music Students During COVID-19 Lockdown. *Frontiers in Psychology*, 12. <https://doi.org/10.3389/fpsyg.2021.643177>
- Pangesti, Y. S., & Wadiyo, W. (2021). Applications Of Demonstrations And Drill Methods For Music Ensemble Practise In Junior High School Student In The Social Interaction Perspective. *Jurnal Seni Musik*, 10(1), 5–10. <https://doi.org/10.15294/jsm.v10i1.46584>
- Pflipsen, M., Torre, D., & Durning, S. (2021). Beyond Grade Point Averages and Medical College Admission Test Scores: A Thematic Analysis of Exceptional Performing Medical Student Applications. *MedEdPublish*, 10(1). <https://doi.org/10.15694/mep.2021.000151.1>
- Puspa, P. A., & Irdhan Epria Darma Putra. (2023). Penggunaan Metode Drill Pada Pelaksanaan Ekstrakurikuler Musik Tradisional di SMP Angkasa Lanud Sutan Sjahrir Padang. *Edumusika*, 1(1), 94–102. <https://doi.org/10.24036/em.v1i1.17>
- Ramafisela, L. (2023). Penerapan Metode Drill dalam Pembelajaran Harmoni Manual. *Grenek Music Journal*, 12(1), 74. <https://doi.org/10.24114/grenek.v12i1.45202>
- Ramafisela, L. (2024). Model Direct Instruction Learning Berbasis Metode Drill dalam

- Pembelajaran Teori Musik. *Grenek Music Journal*, 13(1), 133. <https://doi.org/10.24114/grenek.v13i1.55742>
- Rasmini, N. W. (2020). Meningkatkan Prestasi Belajar Seni Musik melalui Penerapan Model Pembelajaran Direct Instruction dengan Metode Drill. *Journal of Education Action Research*, 4(3), 300–306. <https://doi.org/10.23887/jear.v4i3.27229>
- Scarlato, M. K. M., & Kim, Y. (2026). “But When Are We Going to Learn the Real Do?” Toward Learner-Centered Pitch Practices in U.S. Music Classrooms. *Journal of General Music Education*, 39(2), 15–24. <https://doi.org/10.1177/10483713211032325>
- Setiawan, A. E. (2025). Penerapan Metode Drill Untuk Meningkatkan Hasil Belajar Siswa Pada Pembelajaran Musik Ansambel Kelas IX.4 di MTsN 1 Kota Padang. *Jurnal Pendidikan Tambusa*, 9(1), 4264–4271. <https://doi.org/https://doi.org/10.31004/jptam.v9i1.26756>
- Shen, Y., Zhao, Q., Huang, Y., Liu, G., & Fang, L. (2020). Promotion of Street-Dance Training on the Executive Function in Preschool Children. *Frontiers in Psychology*, 11. <https://doi.org/10.3389/fpsyg.2020.585598>
- Silaban, Y. M., Hutagalung, R. J., Situmeang, D. M., Telaumbanua, E. H., & Simangunsong, R. K. A. (2024). Penerapan Metode Drill dalam Membaca Notasi pada Lagu BE.No 6 Puji Jahowa Nasangap di HKBP Dolok Margu Resort Dolok Sanggul. *Abstrak : Jurnal Kajian Ilmu Seni, Media Dan Desain*, 1(6), 24–39. <https://doi.org/10.62383/abstrak.v1i6.351>
- Smith, A. C. W., Jonkman, S., Difeliceantonio, A. G., O’Connor, R. M., Ghoshal, S., Romano, M. F., Everitt, B. J., & Kenny, P. J. (2021). Opposing roles for striatonigral and striatopallidal neurons in dorsolateral striatum in consolidating new instrumental actions. *Nature Communications*, 12(1), 5121. <https://doi.org/10.1038/s41467-021-25460-3>
- Stijnen, J., Nijs, L., & Van Petegem, P. (2024). Instrument teachers’ practices, beliefs, and barriers regarding musical creativity: Exploring the creative process of interpretation. *International Journal of Music Education*, 42(3), 425–441. <https://doi.org/10.1177/02557614231175777>
- Stumbar, S., Lage, O., Whisenant, E. B., & Brown, D. R. (2020). Developing the Community Engaged Physician: Medical Students Reflect on a Household Visit Curriculum. *Cureus*. <https://doi.org/10.7759/cureus.11593>
- Sulistyo, D. A., Djau, N. S., & Muniir, A. (2021). Penggunaan Metode Drill untuk Meningkatkan Permainan Alat Musik Rebana di SMA. *Jurnal Pendidikan Dan Pembelajaran Khatulistiwa*, 10(7), 1–8. <https://doi.org/10.26418/jppk.v10i7.47926>
- Suwari, N. W. G. W., Yulinis, Y., & Widyarto, R. (2024). Pembelajaran Musik Rekorder Dengan Metode Drill Pada Siswa Kelas Viii Di Smp Negeri 8 Denpasar. *PENSI : Jurnal Ilmiah Pendidikan Seni*, 4(1), 85–94. <https://doi.org/10.59997/pensi.v4i1.3161>
- T. Zaatari, M., Alhakim, K., Enayeh, M., & Tamer, R. (2024). The transformative power of music: Insights into neuroplasticity, health, and disease. *Brain, Behavior, & Immunity - Health*, 35, 100716. <https://doi.org/10.1016/j.bbih.2023.100716>

- Thasya, A., & Putra, I. E. D. (2024). Pelaksanaan Metode Drill pada Kegiatan Pengembangan Diri Paduan Suara di SMP Adabiah. *Filosofi: Publikasi Ilmu Komunikasi, Desain, Seni Budaya*, 1(1), 167–177. <https://doi.org/10.62383/filosofi.v1i1.80>
- Thompson-Bell, J. (2023). Student-centred strategies for higher music education: using peer-to-peer critique and practice as research methodologies to train conservatoire musicians. *British Journal of Music Education*, 40(1), 20–33. <https://doi.org/10.1017/S0265051722000080>
- Usman, H. (2020). Pelatihan dan Implementasi Metode Drill dalam Pembelajaran Seni Musik Bagi Guru SDN No . 73 Bontorita Galesong Utara Kabupaten Takalar. *Seminar Nasional Hasil Pengabdian 2021*, 73, 1056–1061.
- Valeska, G. K., Epria, I., & Putra, D. (2025). Penerapan Metode Drill untuk Meningkatkan Kemampuan Iringan Keyboard pada Kegiatan Ekstrakurikuler Siswa Sekolah Menengah Atas. *MUSED: Jurnal Pendidikan Musik*, 1(2), 84–96. <https://doi.org/10.70078/mused.v1i2.68>
- Walsh, M. M., Krusmark, M. A., Jastremski, T., Hansen, D. A., Honn, K. A., & Gunzelmann, G. (2023). Enhancing learning and retention through the distribution of practice repetitions across multiple sessions. *Memory & Cognition*, 51(2), 455–472. <https://doi.org/10.3758/s13421-022-01361-8>
- Warni, S., Apoko, T. W., Martriwati, M., & Nongkhai, A. N. (2024). A Study on University Students' Self-Regulated Motivation to Improve EFL Speaking Skills Across Academic Levels. *Journal of Languages and Language Teaching*, 12(2), 661. <https://doi.org/10.33394/jollt.v12i2.10870>
- Wunseh, Q. K. (2023). A Conceptual Framework for Inclusive Pedagogy in South African Multilingual Higher Education Classrooms. *Rupkatha Journal on Interdisciplinary Studies in Humanities*, 15(1). <https://doi.org/10.21659/rupkatha.v15n1.03>
- Yokuş, T. (2020). The effect of metacognitive strategies-based teaching practice in guitar education on performance achievement. *Psychology of Music*, 49, 1605–1619. <https://doi.org/10.1177/0305735620968259>
- Yu, S. (2023). Practical Music Training in Cultivating the Musical Creativity of Young Musicians. *Migration Letters*, 21(S1), 42–49. <https://doi.org/10.59670/ml.v21iS1.5937>
- Yuwono, P. H., Irianto, S., Febrianta, Y., Ismoko, A. P., Pratiwo, D. C., Nugraheni, I., Amal, A. I., & Purwokerto, U. M. (2025). Efektivitas Metode Drill Dalam Meningkatkan Pemahaman Tangga Nada Pada Peserta Didik Kelas Iv Sd. *Jurnal Riset Pendidikan Dasar*, 6(1), 143–150.