Available on: https://jsshrs.ep-journals.org/ E-ISSN: 3051-3561, P-ISSN: 3051-3553

Journal of Social Science and Human Research Studies

Volume : 02 Issue : 11 November-2026

Artificial Intelligence in Solfeggio Teaching and Learning: Current Status, Needs, And Lecturer-Guided Priorities

Pham Ngoc Dinh
Hong Duc University, Vietnam

Published Date: November 04, 2026 **Article DOI: 10.65150/EP-jsshrs/V2E11/2026-08**

ABSTRACT:
Background: Solfeggio requires repeated practice in listening, pitch production, rhythmic accuracy, and sight-singing, yet students may receive limited feedback during independent study. Objective: This study investigated teaching and self-practice difficulties, artificial intelligence (AI) readiness, and preferred support functions at Hong Duc University, Vietnam. Methods: A descriptive mixed-methods design used 12 valid lecturer questionnaires, 72 retained student questionnaires from 80 screened, and six semi-structured lecturer interviews collected during 1-7 September 2026. Frequencies, percentages, item-level means on five-point scales, and thematic summaries were examined without inferential testing. Results: Lecturers prioritized AI-assisted pitch practice and recognition (4.75/5) and listening, recording, and error identification (4.67/5). Students gave the strongest priority to exercises matched to individual errors (4.63/5) and recording with basic error detection (4.61/5). Readiness to try AI tools was 4.08/5 among lecturers; students' readiness to use AI with lecturer guidance was 4.50/5. Concerns about feedback accuracy were substantial in both groups. Conclusion: The findings support a limited, lecturer-supervised role for AI in self-practice and formative feedback. They do not establish the effectiveness of any particular AI system.

KEYWORDS: artificial intelligence, solfeggio, sight-singing, aural skills, higher music education, formative feedback, personalized practice.

1. INTRODUCTION

Solfeggio is a core component of university music education because it connects musical notation with listening, internal hearing, vocal realization, and rhythmic coordination. Students must identify pitch relationships, sustain accurate duration, interpret the meter, and correct errors while maintaining a musical phrase. These abilities are not secured by explanation alone. They depend on structured practice, opportunities to repeat demanding passages, and information about what should change in the next attempt. Karpinski (2000) frames aural-skills acquisition as the development of interrelated listening, reading, and performing capacities; Ericsson et al. (1993) emphasize deliberate practice directed at identifiable aspects of performance.

A persistent challenge is that errors occur during independent study, when an instructor may not be available to diagnose them. A student can replay a passage many times without knowing whether the difficulty arises from unstable pitch, incorrect interval perception, rhythmic displacement, or inaccurate notation reading. Feedback theory suggests that correction is useful when learners can identify a goal, recognize their present performance, and select an appropriate next action (Hattie & Timperley, 2007). The problem is therefore not simply the quantity of practice but its informational quality.

Artificial intelligence has prompted interest in automated analysis, adaptive exercises, and progress tracking. However, the expression "AI tool" is often used loosely in music education. A metronome, conventional recording application, or notation editor may be digital without using AI. In this study, AI refers operationally to functions that analyze or recognize performance, generate learning content, or adapt tasks to a learner's responses. Digital tools without such functions are not automatically classified as AI. This distinction matters when interpreting users' reported experience with technology and when selecting candidates for classroom trials (Chen & Lin, 2026).

Much of the wider literature addresses potential applications, while a local teaching unit must first establish which forms of support lecturers and students actually require and which risks they regard as significant. This article investigates that preparatory stage at the Faculty of Culture and Arts, Hong Duc University, Thanh Hoa, Vietnam. It addresses three questions: RQ1: What are the principal difficulties and feedback needs in solfeggio teaching and independent practice? RQ2: How do lecturers and students report technological access, readiness, and concerns about AI? RQ3: Which proposed AI functions are most strongly prioritized, and what conditions should govern an initial trial? The contribution is contextual descriptive evidence and a cautious pedagogical interpretation, not a demonstration of improved learning outcomes.

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2. LITERATURE REVIEW

2.1. Solfeggio as coordinated perceptual and performative practice

Solfeggio integrates listening to tonal and rhythmic relationships with sight-reading and accurate vocal performance. Karpinski (2000) treats aural competence as a set of learnable skills rather than a single talent. For beginning or unevenly prepared university cohorts, the same exercise may reveal distinct problems: students may hear a contour but sing inaccurate intervals, read pitches correctly but lose pulse, or maintain rhythm while misidentifying tonal relationships. A useful instructional response requires diagnosis at the level of the specific error. Deliberate-practice theory likewise associates progress with focused tasks, appropriate difficulty, performance information, and repetition aimed at improvement rather than repetition for its own sake (Ericsson et al., 1993). A Vietnamese study of university fashion-design instruction likewise discusses the importance of teaching technical skills within a practice-oriented curriculum (Tran, 2024); this is a contextual parallel rather than evidence about AI effectiveness in solfeggio.

This multidimensional structure complicates the interpretation of a single automatic score. A pitch indicator may reveal a deviation from the target frequency without explaining whether the learner misread a key signature, misheard an interval, or lacked stable vocal control. Likewise, timing deviations may arise from an uncertain beat, inaccurate note values, or expressive phrasing. For that reason, the unit of instructional feedback should be an interpretable error associated with a task and a possible corrective action. A single aggregate rating risks masking the precise difficulty that students need to address.

2.2. Feedback, self-regulation, and teacher judgment

Hattie and Timperley (2007) describe feedback as information that reduces the discrepancy between current and intended performance. In solfeggio, relevant feedback may concern the location and direction of a pitch deviation, duration or beat placement, or the appropriate next practice step. Such feedback can be formative without becoming a final grade. VanLehn (2011), comparing tutoring arrangements, shows that the design and interaction of instructional support are important to its effectiveness. Roll and Wylie (2016) argue that AI in education develops in relation to changing pedagogical practices rather than functioning as a substitute for them. These perspectives imply a distinction between providing an automated signal and making an educational judgment about a student's musical understanding.

2.3. Digital and AI-based tools in music education

Research on mobile technology-supported music education identifies sustained interest in learners' experiences, the design of instructional activities, and accessible practice resources (Liu et al., 2023). More specifically, Chen and Lin (2026) review AI and digital applications in sight-singing and aural training and show why different functions and study designs should not be treated as interchangeable. Karlıdağ et al. (2026) report an AI-supported solfège intervention in higher music education, contributing evidence from a particular instructional setting. Such results provide a rationale for carefully designed trials but cannot establish that any AI application would produce comparable outcomes at Hong Duc University. Local needs and implementation constraints must be assessed independently.

An additional distinction is needed between detecting a performance feature and adapting pedagogy. A recording application may make repeated listening possible, but that does not itself constitute automated diagnosis. An algorithm may identify note onsets, while a separate system may recommend exercises based on repeated errors. The educational claim should correspond to the demonstrated function rather than to the application's marketing label. This distinction is particularly important in survey research because respondents may use "AI" to describe different technologies. It also creates a practical requirement for subsequent pilots: document the selected system's inputs, outputs, thresholds, and cases in which a human review is necessary.

2.4. Trust, access, and responsible implementation

AI-supported learning introduces issues of reliability, transparency, teacher competence, and data governance. Chiu et al. (2023) identify both pedagogical opportunities and unresolved difficulties in educational AI research. UNESCO guidance emphasizes that institutional planning should consider user capacity, oversight, and responsible handling of data (Miao et al., 2021). Solfeggio adds a practical sensitivity: audio samples may be identifiable, while automated pitch or timing estimates can vary with recording conditions and musical context. A defensible implementation plan must therefore distinguish technical indicators from verified feedback, minimize unnecessary recording retention, and preserve meaningful lecturer control. The present study uses these concepts to interpret reported needs, not to assume that respondents have already experienced an effective AI system.

3. MATERIALS AND METHODS

3.1. Research design and setting

The study used a descriptive mixed-methods design combining two questionnaires with semi-structured lecturer interviews. Data were collected between 1 and 7 September 2026 at the Faculty of Culture and Arts, Hong Duc University. The design was selected to document a specific institutional context before an AI intervention. It did not include treatment and control groups, standardized tests of solfeggio proficiency, a pre-post assessment, or observation of an implemented AI product.

3.2. Participants and screening

Twelve valid lecturer questionnaires were retained. Eleven respondents were currently teaching or guiding solfeggio, while one had prior experience teaching the subject. Of 80 student questionnaires screened, 72 were retained: five had missing or incomplete core information, two were duplicate or non-independent responses, and one did not meet the participant criteria. Six lecturers took part in interviews conducted from 3 to 7 September 2026. Sampling was non-probabilistic and limited to those who participated; the results should not be interpreted as representative of other university programs.

3.3. Instruments and operational definitions

Lecturer and student questionnaires addressed perceived learning difficulties, independent practice, technology access, AI familiarity, readiness, expected support functions, and implementation concerns. Interview prompts explored the same issues with attention to conditions for responsible use. Respondents rated specified statements on five-point Likert-type items. Means and the proportion selecting response levels 4 or 5 were

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computed separately for each item. No composite score, standardized scale, or internal-consistency estimate was constructed. Lecturer and student item wording differed, so corresponding responses provide contextual perspectives rather than a basis for inferential group comparisons. Consistent with the stated operational definition, recording or notation software was considered digital technology but not necessarily AI.

These design choices mean that item-level means are summaries of ordinal responses rather than measurements on a calibrated interval scale. The proportion of respondents selecting levels 4 or 5 offers a complementary description of endorsement, but it does not indicate effect size, predictive value, or statistical significance. The two groups answered partly different sets of statements, so apparent numerical differences cannot be taken as evidence that one group holds a stronger opinion about precisely the same construct. The analysis therefore emphasizes within-group priorities and areas of thematic convergence rather than between-group testing.

3.4. Data processing, qualitative coding, and ethics

Records were managed as source, analysis, and aggregated-output layers. After screening, the analytical dataset included 12 lecturers, 72 students, and six lecturer interviews, with no missing values in variables reported in the results tables. Quantitative analysis was restricted to counts, percentages, item means, and response-level 4-5 proportions. Open-ended student responses were grouped by topic; interview data were coded for the presence of themes, allowing one interview to contribute to several categories. These thematic counts are descriptive and were used to supplement interpretation rather than to estimate population frequencies.

The research used data from the institutionally approved 2026 research task coded DTCS 2026-07. According to the source study, questionnaires explained the research purpose, did not request respondent names, and were analyzed under coded identifiers. Results were reported in aggregate. Approval of the research task is not represented here as a separate institutional ethics-board review. The study involved no testing or deployment of an AI application on participants.

4. RESULTS

4.1. Participant profile and independent-practice conditions

The lecturer group spanned four experience categories, and 11 of 12 had current solfeggio teaching or supervision responsibilities. The student sample included participants from all four study years. Every surveyed student reported having a telephone available for independent learning, while 41 of 72 (56.9%) had a computer. Nevertheless, device access did not imply regular, structured practice: three students (4.2%) reported almost no practice outside class, 60 (83.3%) practiced one to three times per week, and nine (12.5%) practiced four or more times. Table 1 reports the underlying distribution.

Table 1. Profile of respondents and learning conditions

Group	Reported characteristic	n (%)
Lecturers	Teaching experience: under 5 years	2 (16.7%)
	5-10 years	3 (25.0%)
	11-20 years	4 (33.3%)
	Over 20 years	3 (25.0%)
	Currently teach/guide solfeggio regularly	8 (66.7%)
	Currently teach/guide solfeggio occasionally	3 (25.0%)
	Not currently teaching/ guiding solfeggio	1 (8.3%)
	Use computers in teaching	12 (100%)
	Use audio equipment in teaching	10 (83.3%)
Students	Year 1	20 (27.8%)
	Year 2	20 (27.8%)
	Year 3	18 (25.0%)
	Year 4	14 (19.4%)
	Telephone available for self-study	72 (100%)
	Computer available for self-study	41 (56.9%)
	Almost never practice outside class	3 (4.2%)
	Practice once per week	30 (41.7%)
	Practice 2-3 times per week	30 (41.7%)
	Practice at least 4 times per week	9 (12.5%)

Source: Authors' analysis of the 2026 questionnaire data. Percentages use the relevant group denominator; device items were not mutually exclusive.

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4.2. Learning difficulties and formative-feedback needs

The lecturer responses indicate broad agreement about the need for activity outside scheduled lessons and for more frequent feedback. Eleven of 12 lecturers (91.7%) rated extracurricular practice and pitch feedback at levels 4-5; all 12 selected levels 4-5 for rhythmic feedback, listening and recording, individualized exercises, and records of student progress. Among students, 72.2% selected levels 4-5 for difficulty maintaining accurate pitch and 65.3% for difficulty with listening and auditory memory. More salient practical needs were prompt self-practice feedback (90.3%), help recognizing errors without assistance (83.3%), graded tasks (94.4%), and combining lecturer guidance with support tools (97.2%).

Table 2. Perceived difficulties and support needs in solfeggio

Group	Survey statement	Mean (1-5)	Levels 4-5 (%)
Lecturers	More practice outside class	4.67	91.7
	Frequent pitch feedback	4.33	91.7
	Duration/rhythm feedback	4.50	100.0
	More listening and recording practice	4.50	100.0
	Individualized practice tasks	4.50	100.0
	Tracking learning progress	4.50	100.0
Students	Difficulty sustaining accurate pitch	3.88	72.2
	Difficulty listening / retaining sounds	3.74	65.3
	Need prompt feedback during self-practice	4.24	90.3
	Difficulty recognizing own errors	4.07	83.3
	Need exercises at graded levels	4.31	94.4
	Need combined lecturer and tool support	4.54	97.2

Source: Authors' 2026 survey. Values are separate item-level descriptions, not scores on a validated common scale.

4.3. Exposure, readiness, and concerns relating to AI

Readiness to experiment with AI was higher than self-rated knowledge in each group, although this numerical pattern does not identify a causal relationship. Lecturer knowledge of AI averaged 3.67/5 and readiness to try AI for solfeggio averaged 4.08/5; corresponding student ratings were 3.40/5 for knowledge and 4.50/5 for readiness under lecturer guidance. All 12 lecturers selected levels 4-5 for their need for AI-related professional development, and 71 of 72 students (98.6%) did so for guidance on appropriate use. These responses indicate substantial conditional interest, not verified operational competence.

Table 3. Digital access, readiness, and concerns about AI

Group	Survey indicator	Mean (1-5)	Levels 4-5 (%)
Lecturers	Confidence using digital technology	3.42	41.7
	General understanding of AI	3.67	58.3
	Readiness to try AI for solfeggio	4.08	83.3
	Concern about AI feedback accuracy	4.17	100.0
	Concern about dependence / academic ethics	3.92	75.0
	Need for AI-skills training	4.50	100.0
	Concern about data and privacy	3.17	25.0
Students	Confidence using digital applications	3.83	68.1
	Familiarity with AI	3.40	40.3
	Readiness if guided by lecturer	4.50	98.6
	Willingness to record for feedback	4.11	77.8
	Need guidance on appropriate AI use	4.61	98.6

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Group	Survey indicator	Mean (1-5)	Levels 4-5 (%)
	Concern automatic feedback may be wrong	4.06	80.6
	Concern about dependence on AI	3.96	75.0

Source: Authors' 2026 survey. Lecturer and student items are related but not identical.

Reported exposure was uneven. One lecturer had never used AI in teaching, two rarely used it, eight used it occasionally, and one used it frequently. Ten lecturers had used AI to prepare teaching materials; five had used digital or AI tools to check or provide feedback on audio, a combined category that does not establish AI-specific use. Among students, seven had never used AI in learning, 22 rarely used it, 39 occasionally used it, and four frequently used it. Forty-six students (63.9%) reported using an application or tool for pitch, rhythm, listening, or recording, again without confirming that the application used AI.

Accuracy was the most prominent concern: 12 of 12 lecturers and 80.6% of students selected levels 4-5 on items about potentially incorrect automated feedback. Lecturer concerns about data and privacy were less prominent on the questionnaire (3.17/5, with 25.0% selecting levels 4-5) but appeared in four of the six interviews. The two sources therefore capture different kinds of response and should not be treated as contradictory measurements of the same construct.

4.4. Priority functions for AI-assisted support

Preferred functions centered on actionable feedback and independent practice rather than delegating assessment. Lecturers gave the highest average priority to pitch practice and recognition (4.75/5), followed by listening, recording, and error identification (4.67/5). Automated testing or assessment as a reference for the lecturer received a lower mean of 3.75/5, with half selecting levels 4-5. Students ranked exercises matched to their individual errors (4.63/5) and recording with basic error identification (4.61/5) highest. These are priorities stated in questionnaires, not evaluations of deployed capabilities.

Table 4. Priorities for possible AI-related support functions

Group	Proposed support function	Mean (1-5)	Levels 4-5 (%)
Lecturers	Design exercises/materials by difficulty	4.33	100.0
	Pitch training and recognition	4.75	100.0
	Duration, rhythm and meter practice	4.50	100.0
	Listening, recording and error identification	4.67	100.0
	Individualized self-study pathway	4.42	100.0
	Progress tracking and formative feedback	4.50	91.7
	Assessment support as lecturer reference	3.75	50.0
Students	Pitch and interval practice	4.33	91.7
	Duration, rhythm and meter practice	4.15	81.9
	Listening and auditory recognition	4.32	91.7
	Recording and basic error indication	4.61	98.6
	Exercises matched to individual errors	4.63	100.0
	Tracking independent-practice progress	4.33	87.5
	Theory explanation and revision prompts	4.19	83.3

Source: Authors' 2026 survey. The two forms did not contain a single identical measurement scale; figures should not be used for inferential group ranking.

4.5. Interview themes and student-reported barriers

The six lecturer interviews reinforced the central survey concerns. Every interview mentioned the shortage of individual feedback, the need for personalization, uncertainty about accuracy, and the importance of lecturer verification. Five interviews also mentioned disparities in student preparedness, AI assistance with pitch, and listening or recording. Rhythm, progress tracking, and privacy appeared in four interviews each. These counts indicate whether a theme appeared within an interview; they do not represent independent respondents' ratings of its importance.

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Table 5. Themes identified across six lecturer interviews

Interview theme	Interviews mentioning theme
Limited frequent individualized feedback	6/6
Need for personalization	6/6
Concern about feedback accuracy	6/6
Need for lecturer verification and oversight	6/6
Uneven student preparation	5/6
Potential support for pitch practice	5/6
Potential support for listening/recording	5/6
Potential support for rhythm and meter	4/6
Need to track progress	4/6
Data privacy	4/6

Source: Authors' thematic summaries of six lecturer interviews, September 2026. Multiple themes could be coded within one interview.

Open-ended student comments provided additional implementation detail. Frequently identified barriers were English-language interfaces or insufficient instructions (15/72), unstable devices or internet connections (14/72), discomfort with recording or storing personal data (14/72), and distrust of feedback accuracy (13/72). The most frequent proposal was lecturer instruction on how to verify AI responses (20/72). These counts were obtained from categorized comments and should not be interpreted as prevalence estimates based on a validated instrument.

5. DISCUSSION

5.1. A gap between access, readiness, and feedback capacity

The clearest implication is that access to a telephone or occasional use of applications does not resolve students' difficulty in interpreting mistakes during self-practice. Almost all respondents had a means to engage with mobile learning, yet the survey recorded substantial perceived difficulty in pitch accuracy, auditory memory, and self-recognition of error. The particularly high demand for immediate feedback and individualized exercises is compatible with a deliberate-practice account in which the learner needs a specific task and a basis for adjustment (Ericsson et al., 1993). It is also compatible with Hattie and Timperley's (2007) emphasis on actionable feedback. Neither connection establishes that AI is the only, or necessarily the best, response; teacher-designed exercises and non-AI tools may also be relevant.

A second finding concerns conditional adoption. Lecturer readiness and student willingness were relatively high, but their confidence and knowledge scores were more moderate. This suggests that a trial should begin with a narrowly defined educational task, explicit instructions, and a clear process for evaluating the tool's output, rather than with a general requirement to "use AI." The source survey does not measure actual performance with an AI product, so the study cannot conclude that respondents will use such tools accurately or consistently.

5.2. A lecturer-guided practice cycle for initial trials

The convergence of questionnaire priorities and interview themes supports a proposed five-step implementation sequence. First, the lecturer defines a short solfeggio task, an intended pitch or rhythmic target, and a simple assessment criterion. Second, the student attempts and, where appropriate, records the exercise. Third, a technically tested AI function may offer provisional indicators of deviations or propose a task at a suitable level. Fourth, the learner and lecturer verify the indications against the score, listening evidence, and a professional rubric, particularly when the output is inconsistent or the recording quality is poor. Fifth, the student retries the task and documents the adjustment. Figure 1 presents this sequence as a pedagogical proposal derived from the findings; it has not been evaluated experimentally.

This sequence assigns different responsibilities to tools and people. Automated analysis may supply a starting signal about discrete features such as pitch or timing, but lecturers retain responsibility for interpreting those signals in musical context and deciding how a learner should progress. The distinction is especially important where background noise, microphone placement, expressive timing, or a complex musical phrase could lead to misleading automatic classifications. The low relative priority assigned to automated assessment by lecturers reinforces the value of using AI as formative assistance rather than as an autonomous examiner.

5.3. Conditions for responsible implementation

An initial trial should be restricted to selected exercises and tools whose actual functions can be inspected. Before use, staff should determine whether an application employs AI or only conventional digital functions; examine examples of correct and incorrect feedback; define when students must ask a lecturer; and explain how recordings and progress records will be collected, accessed, and deleted. Short, structured training for lecturers and students is justified by the reported demand for guidance. Attention to Vietnamese-language support, connectivity constraints, and students' reluctance to record is also necessary. These are proposed safeguards informed by the survey and ethical literature (Chiu et al., 2023; Miao et al., 2021), not evidence that such safeguards have already been implemented.

A staged evaluation could begin with a small bank of staff-validated sight-singing and rhythm exercises representing different error types. Lecturers could independently review recordings and compare their judgments with the system's indicators, recording both agreements and disagreements. Only after acceptable consistency has been established should the tool be used for guided student practice. A later pilot could collect baseline and

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follow-up performance samples using a common rubric and report how often students accept, question, or override automated feedback. Such indicators would provide more meaningful evidence than adoption rates or satisfaction ratings alone. These steps are recommendations for future inquiry, not activities undertaken in the 2026 survey.

5.4. Limitations and future research

Seven limitations bound the findings. First, the non-probability sample comes from one faculty, with only 12 lecturer respondents. Second, the questionnaire was designed for item-level description, not as a validated psychometric scale. Third, student-program and class variables were not preserved, preventing analysis by curriculum or specialization. Fourth, self-report indicators are not objective measures of solfeggio proficiency. Fifth, the absence of pre-post or comparison data prevents any conclusion that AI improved learning. Sixth, qualitative interviews were limited to lecturers; student perspectives were mainly obtained through questionnaires and open responses. Seventh, inter-coder agreement was not assessed for thematic coding. Future work should first validate candidate tools and a music-specific rubric, then conduct a carefully monitored pre-post trial across more than one cohort, with student interviews and evaluation of accuracy, privacy, and actual learning outcomes.

These limitations also affect the status of the proposed practice cycle. It is a synthesis of stated preferences and pedagogical principles rather than a model statistically derived from participant responses. The thematic frequencies are not independent estimates of construct prevalence; a single interview can generate several themes. Similarly, the percentage selecting response levels 4-5 should not be mistaken for a probability that a particular AI function will work. Claims about technical accuracy, educational efficiency, and transfer to other institutions must await direct testing. This distinction protects the interpretation of the original evidence and defines a more precise agenda for replication.

6. CONCLUSION

This descriptive study documents a clear demand for better-supported solfeggio self-practice at Hong Duc University, based on 12 lecturer questionnaires, 72 retained student questionnaires, and six lecturer interviews. Pitch training, listening and recording, rapid error feedback, personalized exercises, and progress tracking emerged as prominent priorities. Respondents were open to AI assistance, particularly when accompanied by lecturer guidance, yet they also expressed strong concern about the reliability of automated responses.

The contribution is an evidence-based description of local readiness and a proposed lecturer-guided practice sequence for selecting and testing appropriate functions. It is not an evaluation of an AI product and does not show gains in pitch, rhythm, or sight-singing proficiency. The appropriate next step is a limited, ethically managed pilot with verified feedback, teacher oversight, and objective music-performance assessment.

REFERENCES

1) Chen, Z.-L., & Lin, H. (2026). AI and digital technologies in sight-singing and aural training: A systematic review of innovations in higher music education. European Journal of Education, 61(1), e70502. https://doi.org/10.1111/ejed.70502
2) Chiu, T. K. F., Xia, Q., Zhou, X., Chai, C. S., & Cheng, M. (2023). Systematic literature review on opportunities, challenges, and future research recommendations of artificial intelligence in education. Computers and Education: Artificial Intelligence, 4, 100118. https://doi.org/10.1016/j.caeai.2022.100118
3) Ericsson, K. A., Krampe, R. T., & Tesch-Römer, C. (1993). The role of deliberate practice in the acquisition of expert performance. Psychological Review, 100(3), 363-406. https://doi.org/10.1037/0033-295X.100.3.363
4) Hattie, J., & Timperley, H. (2007). The power of feedback. Review of Educational Research, 77(1), 81-112. https://doi.org/10.3102/003465430298487
5) Karlıdağ, B. A., Malkoç, T., & Küçüktepe, S. E. (2026). Artificial intelligence-supported solfège instruction in higher music education: Effects on student performance and learning attitudes. Applied Sciences, 16(11), 5383. https://doi.org/10.3390/app16115383
6) Karpinski, G. S. (2000). Aural skills acquisition: The development of listening, reading, and performing skills in college-level musicians. Oxford University Press. https://doi.org/10.1093/oso/9780195117851.001.0001
7) Liu, C., Hwang, G.-J., Tu, Y.-F., Yin, Y., & Wang, Y. (2023). Research advancement and foci of mobile technology-supported music education: A systematic review and social network analysis on 2008-2019 academic publications. Interactive Learning Environments, 31(7), 4535-4554. https://doi.org/10.1080/10494820.2021.1974890
8) Miao, F., Holmes, W., Huang, R., & Zhang, H. (2021). AI and education: Guidance for policy-makers. UNESCO. https://doi.org/10.54675/PCSP7350
9) Roll, I., & Wylie, R. (2016). Evolution and revolution in artificial intelligence in education. International Journal of Artificial Intelligence in Education, 26, 582-599. https://doi.org/10.1007/s40593-016-0110-3
10) Tran, D. L. (2024). Improving the teaching quality of sewing and cutting techniques for students of fashion design at Thanh Hoa University of Culture, Sports and Tourism [in Vietnamese]. Journal of Science, Thanh Hoa University of Culture, Sports and Tourism, (19), 117-126. https://doi.org/10.55988/2588-1264/186
11) VanLehn, K. (2011). The relative effectiveness of human tutoring, intelligent tutoring systems, and other tutoring systems. Educational Psychologist, 46(4), 197-221. https://doi.org/10.1080/00461520.2011.611369

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Corresponding Author: Pham Ngoc Dinh