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Review Article

A Scoping Review on the Correlation between Piano Teaching Feedback Types and Learning Outcomes

Xinxin Xu[1], Raja Zulkarnain Raja Mohd Yusof[1,*]
[1]City University of Malaysia, Kuala Lumpur 46100, Malaysia
[*]**Correspondence:** Raja Zulkarnain Raja Mohd Yusof, raja.zulkarnain@city.edu.my

Abstract

Feedback, as the core link between teaching and learning in piano instruction, directly impacts learners' skill mastery, learning interest, self-efficacy, and emotional state—key learning outcomes. This scoping review, based on a systematic collation of relevant literature focusing on feedback and learning outcomes in piano instruction, identifies the main types of feedback in piano teaching and analyzes the correlation and influencing mechanisms between different feedback types and learning outcomes. This review identifies that: Objective Information Feedback (GOI) shows cross-situational universality in improving skill accuracy and learning efficiency in existing studies; encouraging feedback may promote long-term learning by enhancing self-efficacy and reducing learning anxiety; guidance-based feedback (Practice Suggestion Feedback (GP), Action Suggestion Feedback (GA)) helps in skill transfer and the development of good practice habits; and technology-assisted feedback (multimodal visualization, digital tool support) presents apparent advantages in optimizing technical movements and stimulating learning interest. Meanwhile, factors such as teacher experience, learners' age and skill level, and the teaching context have moderating effects on feedback effectiveness. This review provides theoretical reference and practical insights for the scientific selection of feedback strategies and the improvement of teaching quality in piano instruction.

Keywords

Piano teaching, Feedback types, Learning outcomes, Correlation research, Teaching strategies

1. Introduction

As a core area of music education, piano pedagogy is essentially a process of skill enhancement and literacy development achieved through information transmission and interactive adjustments between teachers and learners (Li,2010). Feedback, as the most

crucial form of information transmission in this process, is not only an evaluation and guidance of the learner's current performance, but also a core vehicle for stimulating learning motivation, correcting learning deviations, and clarifying developmental direction (de Bruin, 2024). With the diversification of piano teaching methods (individual lessons offline, group lessons online, technology-assisted teaching, etc.) and the diversification of learner groups (children and adults, beginners and advanced learners), the types of feedback are becoming increasingly rich, and their impact on learning outcomes is showing complex correlations.

Existing research has explored the value of feedback in piano teaching from various dimensions: some studies focus on the classification and effectiveness of feedback content (Kagawa et al., 2023), some focus on the relationship between teachers' feedback behavior and teaching beliefs (Li,2010), and some studies explore the application of multimodal feedback by combining technological means (Bae et al., 2025). These studies are rooted in core educational psychology theories including formative feedback theory, self-regulated learning theory, and self-determination theory, laying a theoretical foundation for the study of feedback in instrumental music teaching. However, existing research lacks a systematic integration of the correlation between feedback types and learning outcomes (skill mastery, learning interest, self-efficacy, anxiety regulation, etc.), making it difficult to fully reveal the mechanisms of action and applicable scenarios of different feedback types. Based on this, this scoping review takes existing peer-reviewed studies on piano teaching feedback and learning outcomes as the core data sources, adopts the mature feedback classification framework from Kagawa et al. (2023) and expands it combined with the specific context of piano teaching, to systematically sort out the main types of feedback in piano teaching, analyze the correlation between various types of feedback and learning outcomes, and aims to provide scientific feedback strategy guidance for piano teaching practice and enrich the theoretical system of piano education.

2. Research Methods

2.1. Research Subjects

This scoping review retrieved and screened literature focusing on piano teaching feedback and learning outcomes, with a final total of 10 eligible studies included. The literature search was conducted in 3 core databases: Web of Science, Scopus, and China National Knowledge Infrastructure (CNKI), with a search time range from January 2010 to December 2025. The core search keywords included piano teaching, piano pedagogy, feedback, teaching feedback, feedback types, learning outcomes, learning effect. The search was limited to peer-reviewed journal articles, conference papers, and degree theses published

in English or Chinese. The inclusion criteria for studies were as follows: first, studies focusing on the correlation between teaching feedback types and learning outcomes in piano instruction; second, studies with clear empirical data or systematic theoretical analysis; third, studies covering piano learners of different ages and skill levels. The exclusion criteria were as follows: first, studies unrelated to piano teaching or feedback mechanism; second, duplicate publications, review papers with no original data, and popular science articles; third, studies with incomplete core data or unvalidated research conclusions. The literature screening was completed independently by two researchers. After removing duplicate literature, the titles and abstracts were screened according to the inclusion and exclusion criteria, followed by full-text screening. The inter-rater reliability of the screening results was Cohen's kappa = 0.89, and disagreements were resolved through discussion with a third researcher. The included studies covered various dimensions, including feedback type classification, feedback effects in different teaching contexts, the relationship between feedback and learners' psychological characteristics (self-efficacy, anxiety), and the application of technology-assisted feedback. The research objects included children and adult learners, novice and expert teachers, and teaching scenarios such as offline individual lessons, group lessons, and online lessons, demonstrating strong representativeness and broad coverage.

2.2. Research Methods

This study comprehensively reviewed the included literature to extract core information related to feedback types and learning outcomes. Secondly, referring to the mature feedback classification framework (Kagawa et al., 2023), and combining the feedback formats mentioned in the piano teaching literature, the study systematically coded and categorized piano teaching feedback types. The coding work was completed by two independent coders, with an inter-rater reliability of Cohen's kappa = 0.85, and coding disagreements were resolved through joint discussion. Thirdly, it analyzed the learning outcome indicators (skill mastery, learning interest, self-efficacy, anxiety level, practice persistence, etc.) corresponding to various types of feedback, establishing a correlation matrix between feedback types and learning outcomes, with the specific correlation details detailed in the results section. Finally, it analyzed the internal mechanisms by which different feedback types affect learning outcomes, as well as the moderating effects of teacher characteristics, learner characteristics, and teaching context.

3. Research Results

3.1. Main Types and Characteristics of Piano Teaching Feedback

Based on a systematic review of selected literature, and considering the content, function, and presentation of feedback, piano teaching feedback can be categorized into six core types. Information-based feedback includes Objective Information Feedback (GOI) and General Information Feedback (GSI). GOI is specific information provided by teachers based on verifiable facts (such as score notation and performance technique specifications), characterized by its clarity and strong operability; it is a universally effective type of feedback in cross-instrument teaching (Kagawa et al., 2023). GSI, on the other hand, is feedback provided by teachers based on their personal experience and subjective feelings, focusing on musical expression and subjective experience; its effectiveness is significantly influenced by the teacher's professional level and aesthetic preferences (Kagawa et al., 2023).

Instructional feedback includes Practice Suggestion Feedback (GP) and Action Suggestion Feedback (GA). GP provides specific practice methods, steps, or plans for specific musical passages or technical difficulties, directly addressing practice behaviors and helping learners establish scientific practice habits (Du, 2021; Kagawa et al., 2023). GA is a comprehensive suggestion that guides learners to adjust their performance philosophy or behavioral direction. It does not involve specific practice steps, is inspiring, and helps learners develop a holistic performance mindset (Zhang et al., 2024; Kagawa et al., 2023).

Interactive feedback includes question-based feedback (AQ, Aspect Questioning) and evaluation-based feedback (GF). The above six core feedback categories are mutually exclusive in functional orientation, and fully cover the main feedback forms in current piano teaching scenarios. AQ stimulates learners to think actively by asking targeted questions about performance details, emphasizes teacher-student two-way interaction, and helps cultivate critical thinking and self-regulated learning ability (Kagawa et al., 2023). GF directly evaluates learners' performance skills, knowledge application and other dimensions, has a clear diagnostic function, and can help learners accurately identify their own strengths and weaknesses (Kagawa et al., 2023).

Emotional feedback, centered on encouragement and affirmation, is a type of emotional support feedback. Based on the "Pygmalion effect" in educational psychology, it enhances learners' self-efficacy and alleviates learning anxiety by conveying positive expectations (Qi et al., 2021; Dong & Gedvilienė, 2025).

Technically assisted feedback relies on digital tools and multimodal technologies, such as visualizing performance posture deviations through motion capture technology and using audio analysis tools to provide feedback on pitch and rhythm errors. It is characterized by its

intuitiveness and immediacy, and can make up for the ambiguity of traditional verbal feedback (Bae et al., 2025; Zhang et al., 2024; Zheng & Rodloytuk, 2025).

3.2. Correlation between different feedback types and learning outcomes

This review ultimately included 10 eligible studies, with the following key characteristics: Kagawa et al.'s 2023 study was a cross-sectional quantitative study across instruments, with a sample of 102 teachers across piano, oboe, and guitar, covering learners of all levels and offline one-on-one teaching scenarios. The core study examined six types of feedback, including GOI and GSI, using skill accuracy and feedback usefulness as outcome indicators. It included only piano-specific evidence from a piano subgroup analysis. The core conclusion was a generally positive correlation between GOI and feedback usefulness, and that GA had a significant positive effect on piano learners, with moderate evidence strength. de Bruin's 2024 study was a qualitative interview study, with a sample of 32 instrumental teachers, covering teachers from novice to expert levels and studio teaching scenarios. The core study examined AQ, instructional feedback, and affective feedback, using teacher feedback development and learner self-directed learning as outcome indicators. It included some piano-specific evidence, with high evidence strength, indicating that expert teachers preferred using a combination of AQ and personalized feedback. Dong and... Gedvilienė's 2025 study was a quantitative experimental study with a sample of 124 piano learners, covering both adolescent and adult learners, and taking place in an offline piano lesson setting. Its core research focused on affective feedback and positive emotional feedback (GF), using self-efficacy, learning anxiety, and performance stability as outcome indicators. This was a purely piano-specific study, and its core conclusion was that positive affective feedback significantly reduces learning anxiety and improves performance stability, demonstrating high strength of evidence. Du's 2021 study was a mixed-methods study with a sample of 86 piano beginners, covering both children and adult beginners, and taking place in offline one-on-one/group lessons. Its core research focused on general guidance (GP), affective feedback, and GF, using skill mastery, learning interest, and practice persistence as outcome indicators. This was a purely piano-specific study, and its core conclusion was that GP significantly improves finger control in children's beginners, while adult beginners prefer objective, instructive feedback, demonstrating moderate strength of evidence. Li's 2010 study was a mixed-methods study with a sample of 112... A study by several grassroots piano teachers, covering teachers from beginner to expert levels, and offline piano lesson scenarios, focused on emotional feedback and instructional feedback. The study used teacher-student interaction, student retention, and learning interest as outcome indicators. This was a

piano-specific study, and its core conclusion was a high match between student-centered teaching philosophies and more effective feedback behaviors, with strong evidence. A 2021 study by Qi et al. was a quantitative experimental study with a sample of 98 child piano learners, covering beginners and offline piano lesson scenarios. Its core research focused on emotional feedback, using learning motivation, self-efficacy, and skill mastery as outcome indicators. This was a piano-specific study, and its core conclusion was a significant positive correlation between encouraging feedback and piano learning motivation, with strong evidence. A 2025 study by Bae et al. was a technology development study with a sample of 18 piano learners, covering learners of all levels and online/offline teaching scenarios. Its core research focused on technology-assisted feedback, using posture correction and skill mastery efficiency as outcome indicators. This was a piano-specific study, and its core conclusion was that multimodal technology-assisted feedback was superior to purely verbal feedback in terms of technical correction, with low evidence strength. The study (Liu,2024)was a controlled experiment with a sample of 72 piano learners, covering children and adolescents in offline piano lessons. Its core findings were technology-assisted feedback and gamified feedback, with skill mastery speed and learning interest as outcome indicators. This was a piano-only study, and its core conclusion was that the technology-assisted teaching group achieved significantly faster skill mastery, with moderate evidence strength. The 2024 study by Zhang et al. was a quantitative observational study with a sample of 244 piano lesson recordings, covering teachers from novice to expert levels in studio piano lessons. Its core findings were GOI (Good in Action) and guided feedback, with feedback usefulness and skill correction effectiveness as outcome indicators. This was a piano-only study, and its core conclusion was that specific GOI feedback had a more stable positive effect on skill correction, with low evidence strength. The 2025 study by Zheng and Rodloytuk was a theoretical review study, covering piano learners of all levels in online/offline teaching scenarios. Its core findings were technology-assisted feedback and guided feedback, with teaching quality and skill transfer as outcome indicators. This was a piano-only study, and its core conclusion was that asynchronous technology-assisted feedback could extend the effective duration of feedback, with moderate evidence strength.

Objective information feedback (GOI) is the most stable type of feedback in terms of its impact on learning outcomes. A cross-instrument study by Kagawa et al. (2023) covering piano, oboe, and guitar found a significant positive correlation between the number of GOI sentences and feedback usefulness (piano subgroup $\beta=0.07$, oboe $\beta=0.13$, guitar $\beta=0.12$), and this correlation was independent of instrument type, learner level, and piece difficulty in the study sample. It should be noted that the effect size of GOI on piano learners is slightly lower

than that on oboe and guitar learners, and the generalizability of cross-instrument conclusions to piano teaching scenarios has certain limitations. In piano teaching, GOI helps learners identify specific errors and areas for improvement, reduces cognitive confusion, improves the accuracy and efficiency of skill mastery, and promotes the development of precise musical perception, laying the foundation for the development of advanced performance skills (Kagawa et al., 2023; Zhang et al., 2024; Zheng & Rodloytuk, 2025).

Guided feedback (GP) and general feedback (GA) have context-specific effects on learning outcomes. Studies have shown that GP significantly improves the skills of oboe (β=0.27) and guitar (β=0.13) learners, while GA makes a significant contribution to the usefulness of feedback for piano (β=0.16) and oboe (β=0.15) learners (Kagawa et al., 2023). In piano teaching, GP helps learners overcome technical difficulties and develop efficient practice habits by providing structured practice methods. For example, for children with finger dexterity issues, GP feedback such as "5 minutes of five-finger practice daily, emphasizing fingertip power" can significantly improve their finger control (Du, 2021). GA, on the other hand, promotes skill transfer by guiding learners to focus on macro-level aspects such as phrasing structure and tonality perception (de Bruin, 2024).

Emotional feedback primarily influences learning outcomes by regulating learners' psychological state. Qi et al. (2021) found a significant positive correlation between teachers' encouraging feedback and students' enthusiasm for piano learning ($p<0.01$), and that it could improve learning outcomes by enhancing self-efficacy—the experimental group (receiving encouraging feedback) performed significantly better than the control group (without targeted emotional feedback). Dong and Gedvilienė (2025) further confirmed that positive emotional feedback can reduce learning anxiety ($r=-0.53354$), and this reduction in anxiety significantly improves performance stability and the speed of skill acquisition. For grassroots piano teachers, emotional feedback can also improve the quality of teacher-student interaction and reduce student attrition, especially for young beginners, where encouraging feedback can meet their psychological needs and stimulate intrinsic learning motivation (Li, 2010).

Technology-assisted feedback has unique advantages in enhancing learning interest and skill mastery efficiency. Liu (2024)'s comparative study found that piano learners in the technology-assisted teaching group (including visual feedback and real-time audio analysis) mastered skills significantly faster (average 95 minutes/piece) than those in the traditional teaching group (120 minutes/piece) and the gamified teaching group (105 minutes/piece). Bae et al. (2025) developed a multimodal feedback tool that, by simultaneously presenting video, 3D motion capture data, and sheet music, helps learners intuitively perceive deviations in playing posture, and its technical correction effect is superior to purely verbal feedback.

Furthermore, asynchronous feedback supported by digital tools can overcome time and space limitations, allowing learners to repeatedly review the feedback content and prolong its effectiveness (Zheng & Rodloytuk, 2025). However, technology-assisted feedback also has limitations, such as high equipment costs and the potential for some learners to be hampered by technical barriers (Liu, 2024).

In interactive feedback (AQ, GF), question-based feedback (AQ) promotes deep learning by stimulating active thinking. de Bruin (2024) found that expert teachers prefer to use AQ feedback to guide learners to explore performance expression independently rather than passively receiving instructions. This feedback method can improve learners' metacognitive abilities and critical thinking. The effectiveness of evaluative feedback (GF) depends on the objectivity and constructiveness of the evaluation: specific positive evaluations can reinforce correct behavior, while vague negative evaluations may reduce self-efficacy (Dong & Gedvilienė, 2025). For adult beginners, GF feedback needs to be adjusted in conjunction with their learning objectives to avoid overemphasizing technical standards and causing frustration (Du, 2021).

Based on the core findings of the included studies, the correlations between various types of piano teaching feedback and learning outcomes can be clearly defined as follows: Objective Information Feedback (GOI) is strongly positively correlated with skill mastery and accuracy, moderately positively correlated with learning efficiency and practice habits, and has no significant correlation with learning interest, intrinsic motivation, self-efficacy, and anxiety relief, but is weakly positively correlated with skill transfer and self-directed learning; General Information Feedback (GSI) is weakly positively correlated with skill mastery and accuracy, learning interest, and intrinsic motivation, but has no significant correlation with other learning outcome indicators; Practice Suggestion Feedback (GP) is strongly positively correlated with learning efficiency and practice habits, moderately positively correlated with skill mastery and accuracy, skill transfer, and self-directed learning, and weakly positively correlated with learning interest and intrinsic motivation, but has no significant correlation with self-efficacy and anxiety relief; Action Suggestion Feedback (GA) is strongly positively correlated with skill transfer and self-directed learning, moderately positively correlated with learning efficiency and practice habits, and weakly positively correlated with skill mastery and accuracy, learning interest, and intrinsic motivation, but has no significant correlation with self-efficacy and anxiety relief; Question-based feedback (AQ) is also strongly positively correlated with skill transfer and self-directed learning, moderately positively correlated with learning efficiency and practice habits, weakly positively correlated with skill mastery and accuracy, learning interest, and intrinsic motivation, but has no significant correlation with

self-efficacy and anxiety relief; Question-based feedback (AQ) is also strongly positively correlated with skill transfer and self-directed learning, moderately positively correlated with learning efficiency and practice habits, weakly positively correlated with skill mastery and accuracy, learning interest, and intrinsic motivation, but has no significant correlation with self-efficacy and anxiety relief; Evaluation feedback (GF) showed a strong positive correlation with skill transfer and self-directed learning, a moderate positive correlation with learning efficiency and practice habits, learning interest and intrinsic motivation, and a weak positive correlation with skill mastery and accuracy, self-efficacy and anxiety relief. Emotional feedback showed a strong positive correlation with learning interest and intrinsic motivation, self-efficacy and anxiety relief, a moderate positive correlation with skill transfer and self-directed learning, and a weak positive correlation with skill mastery and accuracy, learning efficiency and practice habits. Technology-assisted feedback showed a strong positive correlation with skill mastery and accuracy, a moderate positive correlation with learning efficiency and practice habits, learning interest and intrinsic motivation, no significant correlation with self-efficacy and anxiety relief, and a weak positive correlation with skill transfer and self-directed learning.

3.3. Moderating Factors of Feedback Effect

Teacher characteristics have a significant impact on feedback effectiveness. A teacher's teaching experience, beliefs, and professional level directly affect the quality and applicability of feedback. de Bruin (2024) categorized teachers into novice, developing, and expert levels, finding that novice teachers tend to use mechanically repetitive, directive feedback; developing teachers begin to focus on the relevance of feedback; and expert teachers can flexibly combine various feedback types based on learner characteristics, providing more inspiring and emotionally supportive feedback. Li's (2010) research also indicates that the teaching beliefs of grassroots piano teachers (such as "student-centered" and "focus on interest cultivation") influence feedback behavior; teachers whose beliefs align with their behaviors provide more effective feedback.

Among learner characteristics, age and prior knowledge level are key factors influencing the effectiveness of feedback. Child beginners respond more positively to emotional and gamified feedback, which significantly enhances their learning interest (Du, 2021; Liu, 2024); adult beginners place greater emphasis on objective information and instructional feedback, highlighting its practicality and efficiency (Du, 2021). Furthermore, learners' self-efficacy also moderates feedback effectiveness: those with high self-efficacy are better able to utilize

negative feedback to improve learning, while those with low self-efficacy require more positive feedback and emotional support (Dong & Gedvilienė, 2025).

In terms of teaching context, the teaching format (individual vs. group) and teaching setting (online vs. offline) influence the implementation and effectiveness of feedback. In individual lessons, teachers can provide personalized feedback, which is more effective; in group lessons, it is necessary to combine AQ (Aspect-Q) feedback and interactive feedback to promote full participation (Li, 2010). In online teaching, technology-assisted feedback can compensate for the shortcomings of verbal feedback; in offline teaching, teachers can provide immediate feedback by combining demonstrations, enhancing the intuitiveness of feedback (Bae et al., 2025).

4. Discussion

4.1. The underlying mechanisms by which different feedback types affect learning outcomes

From a cognitive mechanism perspective, Objective Information Feedback (GOI) and Guided Feedback (GP, GA) work by reducing cognitive load and clarifying learning objectives. Existing studies suggest that GOI provides specific and verifiable information, which may help avoid learners' vague interpretation of the feedback content and reduce cognitive confusion (Kagawa et al., 2023); GP and GA, through structured guidance, appear to help learners establish cognitive connections of "goal-method-outcome," improving the relevance and effectiveness of practice (de Bruin, 2024).

At the level of emotional mechanisms, affective feedback influences learning outcomes by modulating learners' motivation and emotional state. According to self-determination theory, Encouraging feedback may satisfy learners' needs for competence and belonging based on self-determination theory, thus enhancing intrinsic learning motivation (Qi et al., 2021); simultaneously, existing studies show that positive feedback is associated with reduced anxiety levels, which may decrease the occupation of cognitive resources by emotions and improve concentration during performance (Dong & Gedvilienė, 2025). Conversely, feedback lacking emotional support may lead to learners' frustration, especially for young beginners, where negative emotions directly inhibit learning interest and practice initiative (Li, 2010).

In terms of behavioral mechanisms, technology-assisted feedback and interactive feedback play a role in shaping practice behaviors and learning habits. Technology-assisted feedback (such as motion capture and audio analysis) can provide immediate and intuitive behavioral feedback, helping learners quickly correct incorrect movements and form correct muscle memory (Bae et al., 2025); AQ feedback promotes learners' shift from "passive

acceptance" to "active exploration" by stimulating independent thinking, and fosters self-reflective learning habits (de Bruin, 2024).

4.2. Analysis of Consistency and Differences in the Study

The consistency of the research is mainly reflected in two aspects: First, all the literature confirms the effectiveness of objective information feedback (GOI), indicating that providing specific and verifiable feedback is the core strategy of piano teaching. This conclusion is universal across different instruments and different learner groups (Kagawa et al., 2023; Zhang et al., 2024). Second, the positive correlation between emotional support and feedback effectiveness is widely recognized. Both the practical explorations of grassroots teachers (Li Jinwen, 2010) and experimental studies (Qi et al., 2021) emphasize the importance of encouraging feedback in improving learning outcomes.

The main differences in the studies lie in the contextual adaptability of feedback effects. For example, GP feedback is more effective for oboe and guitar learners, while its contribution to piano learners is relatively mild (Kagawa et al., 2023), possibly because piano technique is more complex, and a single exercise suggestion cannot cover all the difficulties. The effectiveness of technology-assisted feedback is affected by the learner's age; children are more receptive to visual feedback, while adults focus more on the efficiency and practicality of feedback (Du, 2021; Liu, 2024). In addition, the impact of teacher characteristics on feedback effects varies: the feedback effects of novice teachers are more influenced by their teaching beliefs, while the feedback effects of expert teachers are more stable (Li, 2010; de Bruin, 2024).

In addition, there are notable heterogeneities and limitations in the existing evidence. First, the included studies have significant differences in sample size, research design, and learner characteristic settings, which may lead to variations in the effect size of feedback across studies. Second, most of the existing studies are short-term intervention experiments, lacking long-term follow-up data on the sustained effect of feedback types on learning outcomes. Third, publication bias may exist in the current research: studies with positive significant results are more likely to be published, while studies with non-significant results are relatively underrepresented, which may overestimate the overall effectiveness of feedback to a certain extent. Finally, some core conclusions are supported by conference extended abstracts with limited peer review, and the robustness of the relevant findings needs to be further verified by high-quality large-sample empirical studies.

4.3. Lessons Learned

In the personalized selection of feedback types, the types of feedback should be combined according to the characteristics of learners: children and beginners should focus on GOI, emotional feedback and gamified interactive feedback, adult beginners can increase the proportion of GP and GA feedback, and advanced learners should strengthen AQ feedback and higher-order GOI feedback (such as objective analysis of musical expression).

Improving teachers' feedback skills requires targeted training: novice teachers need to strengthen their training in the accuracy of objective information feedback to avoid vague evaluations; developing teachers should focus on the contextual adaptability of feedback and adjust their feedback methods according to the teaching scenario; expert teachers can leverage the inspirational nature of feedback to cultivate learners' self-directed learning abilities through AQ feedback (de Bruin, 2024). At the same time, teachers should establish a student-centered feedback philosophy, balancing technical guidance with emotional support (Li Jinwen, 2010).

The appropriate application of technology-assisted feedback should be combined with teaching needs: motion capture tools can be used to correct playing posture in individual offline classes, while asynchronous audio feedback can be used to extend the feedback time in online classes; it is necessary to avoid technology dependence and ensure that technology-assisted feedback is combined with verbal and emotional feedback (Bae et al., 2025; Zheng & Rodloytuk, 2025).

5. Conclusion

This scoping review, based on systematically screened peer-reviewed literature, analyzes the correlation between different feedback types and learning outcomes in piano teaching. The review identifies that: Objective Information Feedback (GOI) is the core feedback type for promoting skill mastery and shows cross-contextual applicability in existing studies; Guided Feedback (GP, GA) may improve practice efficiency and skill transferability through structured guidance; Affective Feedback appears to promote long-term learning by enhancing self-efficacy and reducing learning anxiety; Technology-Assisted Feedback presents apparent advantages in optimizing the effectiveness of technical correction through its intuitiveness and immediacy; and Interactive Feedback helps cultivate learners' independent thinking and self-regulated learning abilities. Teacher characteristics, learner characteristics, and the teaching context are important moderating factors influencing feedback effectiveness.

The limitations of this study are: the sample size of the literature on which it was based is limited, and some literature suffers from small sample sizes and limited research contexts; there is insufficient exploration of the combined effects of feedback types, with existing

studies focusing primarily on the effects of single feedback types and lacking systematic analysis of the combined application of multiple feedback types. Future research could expand the sample size, conduct long-term follow-up studies to explore the combined effects of different feedback types; combine artificial intelligence technology to develop personalized feedback systems to achieve precise matching between feedback types and learner characteristics; and strengthen research on feedback strategies for special groups (such as learners with special needs and elderly learners) to enrich the theoretical and practical system of piano teaching feedback.

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References

[1] Bae, J., Kwon, T., Wada, Y., Cho, H., Kim, K., Park, D., Choi, Y.-S., Hur, H., Kai, S., Obata, S., Maezawa, A., Park, J., & Nam, J. (2025). *Designing a multimodal viewer for piano performance analysis: A pedagogy-first approach*. Extended Abstracts for the Late-Breaking Demo Session of the 26th International Society for Music Information Retrieval Conference, Daejeon, South Korea.

[2] de Bruin, L. R. (2024). Instrumental music teachers' development of feedback across the lifespan: A qualitative study. *International Journal of Music Education*, *42*(1), 32–46. https://doi.org/10.1177/02557614231151445

[3] Dong, S., & Gedvilienė, G. (2025). Using self-efficacy and reflection to improve piano learning performance. *Education Sciences*, *15*(1), Article 50. https://doi.org/10.3390/educsci15010050

[4] Du, S. (2021). What teaching methods can be used by piano teachers to improve learning outcomes of child and adult beginners. *Advances in Social Science, Education and Humanities Research*, *637*, 113–119. https://doi.org/10.2991/assehr.k.220131.020

[5] Kagawa, R., Iino, N., Takeda, H., & Matsubara, M. (2023). Effective textual feedback in musical performance education: A quantitative analysis across oboe, piano, and guitar. *Proceedings of the 16th International Symposium on Computer Music Multidisciplinary Research*, 146–157. https://doi.org/10.5281/zenodo.10112068

[6] Liu, J. (2024). Compare the effect of different teaching methods in piano education. *Highlights in Business, Economics and Management*, *43*, 661–666. https://doi.org/10.54097/nt1nbh54

[7] Li, J. (2010). A study on the teaching beliefs and behaviors of grassroots piano teachers. *Art Education Research*, *19*, 149–180.

[8] Qi, W., Dong, X., & Xue, X. (2021). The Pygmalion effect to piano teaching from the perspective of educational psychology. *Frontiers in Psychology*, *12*, Article 690677. https://doi.org/10.3389/fpsyg.2021.690677

[9] Zhang, H., Cheung, V., Nishioka, H., Dixon, S., & Furuya, S. (2024). *How does the teacher rate? Observations from the NeuroPiano dataset*. Extended Abstracts for the Late-Breaking Demo Session of the 25th International Society for Music Information Retrieval Conference, San Francisco, United States.

[10] Zheng, X., & Rodloytuk, P. (2025). A review on piano performance teaching strategies based on the UbD model. *The EUrASEANs: Journal on Global Socio-Economic Dynamics*, *1*(50), 420–428. https://doi.org/10.35678/2539-5645.1(50).2025.419-428

[11] Hamond, L., Himonides, E., & Welch, G. (2020). The nature of feedback in higher education studio-based piano learning and teaching with the use of digital technology. *Journal of Music, Technology & Education*, *13*(1), 33–56. https://doi.org/10.1386/jmte_00015_1

[12] Haughton, J. F. (2015). *The efficacy of feedback in pianoforte studies* (Doctoral dissertation). University of Warwick. https://wrap.warwick.ac.uk/77735/