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Exploring Interactions with AI-Based Music Composition Tools Across Different Levels of Musical Expertise

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Abstract This study aimed to explore the characteristics of interaction and perceptions of collaboration with AI that emerge when composition majors and non-majors use AI-based music generation tools during the composition process. Twenty Korean undergraduates (10 composition majors, 10 non-majors) completed an individual composition task using Soundraw, with data collected through surveys, screen recordings with think-aloud protocols, and post-task interviews. Results showed that composition majors tended to engage in detailed modifications and refinements of the generated outputs, whereas non-majors more frequently relied on repeated playback and regeneration. In addition, non-majors were more likely to regard AI outputs as finalized results, while composition majors viewed them as flexible creative materials that could be further modified and developed. Although both groups acknowledged AI's efficiency and idea-generating benefits, their educational needs for AI use differed according to their level of musical understanding, highlighting the need for learner-level-based and personalised music education designs in which AI is positioned as a collaborative partner requiring critical understanding and creative utilization.

Key words: AI-based music generation, human-AI collaboration, music composition education, interaction strategies, learner expertise, generative AI, educational needs

초록 본 연구는 작곡 전공자와 비전공자가 AI 기반 음악 생성 도구를 활용한 작곡과정에서 나타나는 상호작용의 특성과 AI 협력에 대한 인식을 탐색하였다. 한국 대학생 20명(작곡전공자 10명, 비전공자 10명)을 대상으로 사운드로우를 활용한 개별 작곡 과제를 수행하도록 하였고, 사전·사후 설문, 과제 수행 화면 녹화 및 구술, 사후 면담 자료가 수집되었다. 설문 자료는 독립표본 t-검정, 수행과정은 인식적 네트워크 분석, 면담 자료는 주제 분석으로 처리하였다. 분석 결과, 전공자와 비전공자는 AI와 상호작용하는 서로 다른 전략을 보였으며, 비전공자는 AI 산출물을 완성된 결과로 인식한 반면 전공자는 조정 가능한 창작 재료로 인식하였다. 또한 두 집단 모두 AI의 효율성과 아이디어 제공 효과를 인정하면서도, 음악 이해 수준에 따라 교육적 요구는 다르게 나타났다. 본 연구는 생성형 AI 기반 작곡 환경에서 학습자의 수준에 따른 인간-AI 협력 경험을 고려한 음악 교육 설계의 필요성을 시사한다.

주제어: AI 기반 음악 생성, 인간-AI 협력, 음악 작곡 교육, 상호작용 전략, 학습자 전문성, 생성형 AI, 교육적 요구

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I . Introduction

Artificial intelligence has increasingly permeated diverse domains, and its influence is becoming progressively visible within the music industry. Generative AI enables music composition through personalized prompts, allowing human intention and AI-generated outputs to jointly shape the creative process without requiring specialized knowledge, thereby prompting new discussions in the arts. One illustrative example of this transformation is the emergence of AI-based virtual music artists such as Xania Monet. This artist does not exist as a physical individual; rather, both the visual identity and vocal performance are generated through AI technologies. Notably, the songs performed by this virtual artist are composed using the generative AI tool Suno (France, 2025). Such developments suggest a fundamental reconfiguration of agency within the process of musical creation. In this evolving landscape, learners are therefore no longer expected to function solely as independent creators, but rather as agents capable of critically engaging with and regulating AI-mediated creative processes.

The proliferation of generative AI presents both new opportunities and challenges for music composition education. Generative AI possesses the capability to computationally combine diverse genres and musical elements in novel ways, enabling the generation of original and engaging musical compositions (Ardeliya et al., 2024; Dash & Agres, 2024). In particular, generative AI allows users to compose music by simply inputting basic parameters such as mood or genre, thereby making music composition accessible even with minimal technical knowledge (Dash & Agres, 2024; Zhao et al., 2025). AI-supported music education has the potential to enhance students' engagement and lower the barriers to creative expression (Cheng, 2025).

Despite these benefits, important concerns have been raised. In addition to issues of copyright and ethics (Chan, 2024), the rapid generation of sophisticated ideas through generative AI in educational contexts may undermine individuals' confidence in their own creativity and reduce the motivation required to think beyond AI-generated suggestions (Cheng, 2025; Habib et al., 2024). AI-generated music may appear technically plausible; however, closer analytical examination may reveal structural and affective limitations (Park, 2024). This is because AI operates by reproducing patterns derived from training data, which constrains its capacity to fully understand and express the complexity of human emotions or the contextual meanings embedded in specific situations (Dash & Agres, 2024; Mycka & Mańdziuk, 2024). Therefore, students are required to move beyond AI-generated outputs to construct musically meaningful outcomes.

These discussions warrant particular attention within the context of Korean music education,

which emphasizes creative activities as a core competency. The 2022 Revised National Music Curriculum highlights not only the artistic value but also the educational utility of creative activities, explaining that music is formed through the exploration of human imagination and potential according to its own unique principles and structures (Ministry of Education, 2022). This suggests that one of the primary goals of music education is to cultivate learners' imagination and inquiry based on an understanding of the inherent principles and characteristics of music. From an educational perspective, meaningful engagement with music enables learners not only to develop new ways of understanding the world around them, but also to experience processes of self-discovery and creative expression (Kaschub & Smith, 2009). Accordingly, in light of these creativity-centered educational goals, pedagogical considerations are required to ensure that the integration of generative AI does not lead to overreliance, but is instead employed to enhance human creativity and to support learners' construction of musical meaning by placing greater emphasis on the creative process rather than solely on the final output (Cheng, 2025; Merchán Sánchez-Jara et al., 2024).

To effectively implement AI in real educational settings, it is necessary to first examine the conditions under which AI can be symbiotically integrated within the context of music education (Merchán Sánchez-Jara et al., 2024). In particular, the effectiveness of human-AI collaboration may vary not only depending on the functionality of the technology itself, but also on the characteristics of the learners who engage with it, with differences in learners' prior experience (Chae & Yoon, 2025; Kim & Cho, 2023). For example, less experienced learners tend to rely more on AI, whereas more experienced learners may modify outputs or perceive AI as constraining their creativity (Suh et al., 2021). This suggests that learners' prior experience and level of formal training may lead to differences in how they interact with generative AI during the creative process, resulting in either uncritical acceptance of AI-generated outputs or limited use of its capabilities.

Music education is necessary not only for learners who lack formal training but also for those with prior compositional experience. As technological tools increasingly become integrated into the objectives of music creation education, understanding how learners engage with AI-mediated creative processes has become an important educational concern in the context of instructional design. However, prior research has primarily focused on the technical capabilities of generative AI or users' acceptance intentions, often informing instructional design without sufficient consideration of learners' characteristics in the context of music creation (He & Ren, 2025; Li et al., 2025; Zhou et al., 2025). For AI-supported music creation to be effectively integrated into educational

contexts, it is necessary to understand how learners with varying levels of formal training engage with generative AI and what educational needs arise from this process. In response to this gap, the present study seeks to examine learners' patterns of engagement with AI-assisted music creation and their perceived educational needs. The purpose of this study is to explore how patterns of use and perceptions in the process of AI-based music creation vary according to university students' levels of domain-specific prior experience, and to draw implications for the design of effective music education. As this study is conducted with university students, its findings have limitations in terms of direct generalization to music classes in elementary and secondary school settings. Nevertheless, by examining how patterns of use and perceptions in AI-based music creation differ according to learners' levels of musical understanding—particularly whether they have prior composition experience—this study aims to derive implications that may inform the design of AI integration and teacher support strategies tailored to learner levels in future school music instruction. The research questions are as follows:

First, what differences exist in the patterns of interaction with AI music generation tools between composition majors and non-majors?

Second, how do composition majors and non-majors perceive the process of collaborating with AI in music composition?

II. Literature Review

1. Generative AI in music composition and music education

1) Generative AI in music composition

An AI music generator is a tool that uses artificial intelligence, particularly generative AI technologies, to create new music based on user input. By learning from vast amounts of musical data, these systems analyse musical patterns such as rhythm, melody, harmony, and song structure, and transform text prompts or audio inputs into high-quality musical outputs (Feuerriegel et al., 2023; Wei et al., 2025). In this process, AI music generators do not simply reproduce or replicate existing music; rather, they construct new sounds through probabilistic prediction and pattern recognition based on the data on which they were trained (Civit et al., 2022).

AI music generators have evolved into various types depending on their input methods and

intended purposes. In the early and intermediate stages, music was primarily generated by allowing users to select parameters such as genre, mood, tempo, and instrumentation, with representative examples including AIVA, Soundraw, and Amper Music (Wei et al., 2025). More recently, text-prompt-based generation has become widespread, enabling users to create music with both vocals and accompaniment by simply entering sentences such as “lo-fi jazz suitable for a rainy day” (Zhao et al., 2025). Notably, Suno and Udio demonstrate strengths in rapidly generating popular-style songs and offering sophisticated editing features with high sound quality, respectively, while Google MusicLM and Meta MusicGen further illustrate the potential of music generation technologies integrated with large language models (Mitra & Zualkernan, 2025; Wei et al., 2025).

AI-based music production tools have lowered the technical barriers to entry by enabling users without extensive musical training to create professional-quality compositions more efficiently, thereby contributing to the democratization of music production (Park, 2024; Thomas & Kumar, 2024). Beyond enhancing accessibility, these systems are increasingly assuming more active roles in the creative process. Generative AI systems not only assist human artists throughout the creative process under their supervision but also contribute to music production by facilitating idea generation, structural refinement, and iterative development of musical outputs (Kang & Lee, 2023). In this way, AI is increasingly positioned not merely as a passive tool, but as an active participant that shapes the process of music creation.

2) Generative AI in music education

AI has transformed teaching and learning processes in music education by enabling personalized learning, real-time feedback, creative support, and automated assessment (Merchán Sánchez-Jara et al., 2024). This trend is also reflected in the 2022 revised music curriculum, which emphasizes expanding learners’ experiences through the use of diverse media and AI. (Kim & Park, 2025; MOE, 2022). Music creation presents a relatively high entry barrier compared to other artistic domains, as it requires advanced skills such as instrumental performance or knowledge of harmonic theory. Considering that traditional music creation education has often been theory-driven or advantageous to students with instrumental proficiency, AI-based music creation tools hold the potential to provide creative experiences for learners with limited musical backgrounds (Fu et al., 2025; Kim, 2025; Zhuang & Li, 2025).

Accordingly, an increasing number of music education practices have adopted generative AI

to support creation-centered learning. For example, Bach Doodle supports learners' understanding of harmonic functions and stylistic characteristics of Baroque music by automatically generating Bach-style four-part harmonizations based on a simple melody created by the learner, thereby enabling even non-majors to intuitively experience classical music structures (Choi, 2023; Sularso et al., 2025). In addition, Kim and Hong (2024) demonstrated that ChatGPT can be used in secondary school music curricula to support students in generating and revising lyrics, chord progressions, and melodies within creative tasks. Jung et al. (2024) further reported that a vlog production activity designed in collaboration with generative AI showed potential for enhancing students' creative expression and AI communication competencies. Moreover, Lee (2024) implemented a four-week creative program for non-music majors in which students designed lyrics and chord progressions using ChatGPT and realized them through BandLab and Chord Player. These AI-based creative tools enable stylistic imitation, genre blending, and experimental composition, thereby reducing the technical complexity of the creative process (Cheng, 2025; Fan & Shi, 2025), and support learners in focusing more on musical structure and aesthetic value by assisting with complex harmonic calculations (Bian et al., 2023; Vengathattil, 2025).

Empirical studies have reported that AI-supported music creation classes can induce various positive changes in learners. Students who participated in AI-based creative activities demonstrated significant improvements not only in rhythm and melody recognition but also in their ability to perceive tonality and harmony (Choi, 2023). As psychological barriers to the creative process were reduced, learners also showed increased satisfaction with and engagement in music classes (Kim, 2025; Kim & Hong, 2024). Furthermore, creative approaches that had previously relied on intuitive or affective processes shifted toward more systematic thinking based on harmonic progressions and musical form through the use of AI tools (Kim, 2025). During the process of receiving real-time feedback, learners were also found to strengthen their self-regulated learning abilities by independently setting goals and adjusting strategies (Liu, 2025; Ou et al., 2025).

However, the educational use of generative AI does not always lead to positive outcomes, and its limitations and potential risks have been increasingly discussed. When the automation functions of AI are overly emphasized, learners may overlook the acquisition of fundamental musical concepts and principles or passively accept and imitate AI-generated outputs without critically evaluating them, resulting in superficial engagement with the creative process (Li & Wang, 2023). In addition, current prompt-based generative models have limitations in enabling fine-grained musical control, which may lead to outputs lacking musical depth or artistic completeness (Lee, 2024). Difficulties in music notation have also been reported due to discrepancies

between the graphical user interfaces of AI tools and traditional staff notation systems (Choi, 2023). In this context, AI should be understood as an assistive tool rather than a substitute for human creativity, highlighting the importance of teachers' mediating roles in determining the timing and manner of AI integration and in fostering learners' critical thinking.

2. Cognitive foundations of musical expertise in music creation

The manner in which individuals perform tasks within a specific domain is not determined solely by the amount of knowledge they possess, but may instead vary according to the cognitive frames through which they perceive and interpret problems and their environment (Chi et al., 1981; Ericsson, 2018). In other words, even when performing the same task, differences in how individuals structure and understand a given problem can lead to variations in the way information is utilized and in the strategies employed for problem solving. Such cognitive frames are shaped not merely by the amount of exposure to domain-related activities, but by structured knowledge networks formed through prior experience and training. Previous studies suggest that domain-relevant experiences and training enable individuals to organize information into relational networks rather than storing it as isolated fragments (Chi et al., 2010; Gobet & Charness, 2006).

Such differences in cognitive systems based on prior experience are similarly observed in the domain of music. Learners with musical training tend to demonstrate greater sensitivity to tonal centrality and harmonic progression and are more likely to perceive and organize music based on structural expectations rather than isolated elements such as individual notes or rhythmic units (Bigand & Poulin-Charronnat, 2006; Herholz & Zatorre, 2012). More recently, these processes have been understood through the lens of Predictive Processing, which conceptualizes cognition as a process of forming and updating internal models based on expectations about sensory input (Vuust et al., 2022; Williams, 2018). According to this perspective, domain-specific experience alters how individuals attend to and interpret sensory information, gradually enhancing the precision and structural organization of internal generative models (Bigand & Poulin-Charronnat, 2006).

Consequently, the level of refinement in these internal generative models may influence not only how musical information is interpreted, but also how individuals evaluate and modify creative outputs during the composition process, thereby playing a critical role throughout creative performance. From this perspective, the development of musical expertise may be understood as the progressive refinement of internal generative models that support the structural interpretation and regulation of musical information.

3. Music composition based on Human-AI collaboration

1) Human-AI collaboration

Human-AI Collaboration (HAC) refers to the collaborative capability in which humans and artificial intelligence interact, allocate roles, and jointly perform tasks to achieve shared goals. This perspective moves beyond viewing AI as a mere tool and instead conceptualizes it as a collaborative partner with which humans can communicate and cooperate based on mutual understanding and trust (Schmidt & Loidolt, 2023). HAC is closely associated with the concept of Hybrid Intelligence, wherein humans and AI leverage their respective strengths to perform tasks complementarily, enabling outcomes that would be unattainable by either agent alone while extending human cognitive capabilities throughout the task execution process (Markauskaite et al., 2022; Song & Cho, 2023).

HAC extends beyond a technical interaction involving task delegation and is grounded in a form of cognitive division of labor between humans and AI systems. As AI takes on computationally intensive processes such as data analysis and idea generation, human cognition is reallocated toward higher-order functions including goal setting, contextual interpretation, evaluation, and integration of outputs (Fui-Hoon Nah et al., 2023; Juan et al., 2026). In this sense, such collaborative structures can be understood as an extended cognitive process in which human cognitive resources are strategically distributed and orchestrated through interaction with AI (Sidorkin, 2025).

Given that AI performance alone cannot guarantee the appropriateness of task execution, human involvement in defining performance criteria and adjusting outputs plays a critical role in shaping overall system performance (Natarajan et al., 2025). Accordingly, human-in-the-loop collaborative structures that enable continuous human participation in decision-making processes have been emphasized as essential for ensuring effective task performance (Mosqueira-Rey et al., 2022). How humans interpret, evaluate, and adjust these results may vary depending on their level of expertise, suggesting that experts and novices differ in how they utilize AI systems. These differences may also affect the extent to which individuals benefit from AI-assisted processes, as not all users are able to equally leverage the potential afforded by AI (Chae & Yoon, 2025; Newman et al., 2023).

For example, individuals with formal musical training tend to demonstrate greater sensitivity to tonal centers and harmonic progressions and are more likely to perceive music in terms of structural expectations rather than as isolated pitches or rhythmic units (Bigand & Poulin-Charronnat,

2006). This suggests that the interpretation and evaluation of AI-generated outputs may vary according to users' domain expertise, highlighting the need for collaborative structures that account for human cognitive characteristics to support effective human-AI collaboration. The performance of AI systems is influenced not only by the underlying algorithms but also by the various forms of input and judgment provided by humans, with human expertise serving as a critical factor in determining the overall level of system performance (Inkpen et al., 2023; Natarajan et al., 2025).

2) Human-AI music composition

Music composition through human-AI collaboration can be categorized into different collaborative models depending on how humans and AI participate in the creative process. A. Raza classifies creative collaboration into three primary models (Raza, 2025). First, assistive collaboration refers to a model in which AI functions as a tool that supports repetitive and mechanical tasks, such as generating background music or enhancing visual effects, while the human creator retains full control over the final output. Second, co-creation represents an interactive partnership between humans and AI, where AI proposes new ideas or creative directions and humans refine and adapt these suggestions to jointly develop creative outcomes. Third, autonomous AI creativity refers to a model in which AI independently generates content with minimal human intervention after initial parameters, such as style or theme, are specified by the human creator.

Within these collaborative models, AI plays a functional role in restructuring the cognitive demands of the creative process (Raza, 2025). By leveraging large-scale data, AI can propose melodies, lyrics, or visual elements that may be difficult for humans to generate independently, thereby expanding the creative search space (Fu et al., 2025). At the same time, AI can handle repetitive and mechanical tasks such as file management, information retrieval, and sound mastering, allowing human creators to allocate greater cognitive resources to higher-level creative decision-making (Hemraj, 2026; Newman et al., 2023; Tipei et al., 2021). In such collaborative settings, the role of human creators shifts from directly generating outputs to evaluating and selecting among AI-generated alternatives and aligning them with their artistic intentions (Wang & Martin, 2025). This emerging cognitive division of labor suggests a corresponding shift in the core competencies required of music creators. In AI-supported creative environments, not only the ability to produce musical outputs but also the capacity to evaluate, interpret, and coordinate generated results becomes a critical competency for effective creative performance.

III. Methods

1. Participants

A total of 20 undergraduate students from a university in South Korea participated in this study, including 10 students majoring in music composition and 10 students from other disciplines (e.g., social sciences, engineering, humanities). The composition majors had, on average, approximately five years of prior composition experience, whereas the non-majors had no prior experience in composition. All participants were recruited through an online announcement and voluntarily agreed to take part in the study. Participants ranged in age from 20 to 29 years old. None of the participants had prior experience using AI-based music generation tools.

To ensure baseline equivalence between the two groups, independent-samples t-tests were conducted to examine potential pre-task differences in attitudes toward artificial intelligence and learning engagement. The results indicated no statistically significant differences between the composition-major group and the non-composition-major group on these measures at baseline (see <Table 1>). Prior to the study, informed consent was obtained from all participants, and the research protocol was approved by the Institutional Review Board.

<Table 1> Group differences in attitudes toward artificial intelligence and learning engagement

Construct	Composition-major group	Non-composition-major group	<i>t</i>	<i>p</i>
Attitudes toward artificial intelligence (pre)	3.08	3.13	1.131	.144
Attitudes toward artificial intelligence (post)	3.13	3.22	0.844	.210
Learning engagement	3.58	3.73	0.739	.239

p* < .05, *p* < .01, ****p* < .001

2. Data collection

The data collection process of this study consisted of five stages: a pre-task survey, task preparation, task execution, post-task survey, and post-task interview. In the pre-survey, participants' background characteristics, including prior composition experience and attitudes toward artificial intelligence, were collected. Attitudes toward AI were assessed as a pre-control variable, given that perceptions of AI may influence individuals' willingness to engage with, rely on, or critically

evaluate AI-generated outputs during task performance (Kim et al., 2022; Liang & Reiss, 2025). This was intended to ensure that any observed differences in interaction patterns were not attributable to pre-existing attitudinal differences toward AI between the groups. In addition, learning engagement was measured to control for potential differences in task involvement between the two groups, as variations in engagement levels could influence how participants interact with AI systems during the task. This procedure was conducted to ensure that any observed differences in interaction patterns were attributable to learners' levels of compositional expertise, rather than disparities in task engagement or prior attitudes toward AI.

In the task preparation stage, participants received 10 minutes of instruction on how to use the AI-based music generation tool, Soundraw. The guidance was provided through a pre-prepared instructional video to ensure a basic and consistent level of understanding across participants. Soundraw is an AI-driven music generation tool that enables users to create music according to their preferences and adjust detailed elements of the generated outputs (Atanacković, 2024; Bown, 2025). Unlike text-only generative tools, it allows users to directly manipulate structural musical components such as track length, instrumentation, drum, bass, and melody elements, as well as mixer settings. In this study, Soundraw was selected as the experimental tool to minimize the relative influence of participants' ability to compose text prompts or verbally articulate musical terms, and to more directly observe regulatory behaviours such as listening to generated outputs, selecting among alternatives, regenerating results, and making fine-grained adjustments.

The task execution stage constituted the core phase of the study, in which participants individually created music with AI through one-on-one Zoom sessions. Participants performed the same task according to their assigned group. The task was to create background music suitable for a short-form video intended to promote themselves. Each participant was given a total of 15 minutes to complete the task, during which they were instructed to apply a think-aloud protocol. To facilitate this process, the purpose of the think-aloud method and how it would be conducted were briefly explained prior to the task, and a short practice session was also conducted during the performance stage. The researcher minimized intervention in participants' thought processes throughout the task. This approach enabled the real-time collection of participants' cognitive decision-making processes and interaction patterns with the AI during the music generation activity (Wolcott & Lobczowski, 2021). All task sessions were screen-recorded with participants' consent.

Immediately following the task, a post-survey was administered. This survey measured participants' learning engagement during the task and their attitudes toward AI, allowing for comparison with

the pre-task survey results. Finally, in the post- interview stage, semi-structured interviews were conducted to explore participants’ experiences in depth. The interviews focused on participants’ interaction with the AI music generation tool, their perceptions of its usefulness, and its potential for educational use. All interviews were audio-recorded for research purposes and subsequently transcribed for qualitative analysis.

<Table 2> Overview of the data collection procedure

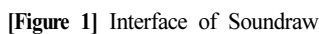
Stage	Description	Duration	Data collected
Pre-survey	Collection of demographic information, prior composition experience, and attitudes toward AI	3 min.	Gender, prior composition experience, AI attitudes
Task Preparation	Instruction on how to use the AI-based music generation tool (Soundraw) via a pre-prepared instructional video	10 min.	-
Task Execution	Individual music composition with AI	15 min.	Screen recording, verbal think-aloud responses
Post-survey	Collection of learning engagement and post-task attitudes toward AI	3 min.	Learning engagement, AI attitudes
Post Interview	Semi-structured interview on participants’ perceptions of AI interaction and collaborative experience, educational application	About 50 min.	Interview audio recordings

3. Data analysis

In this study, survey, task performance, and interview data were analyzed using methods appropriate to their respective characteristics, allowing for an integrated quantitative, process-oriented, and qualitative analysis. First, to examine baseline equivalence between groups, the pre- and post-survey responses were preprocessed and analyzed using independent samples t-tests. This allowed for comparisons between the composition majors and the non-majors in terms of attitudes toward artificial intelligence and learning engagement at both pre- and post-task stages.

Next, task performance data were analyzed using Epistemic Network Analysis (ENA). ENA is a method that visualizes coded qualitative data in network form to analyze how cognitive elements such as knowledge, skills, and values co-occur over time (Shaffer et al., 2016). ENA is considered suitable for process-oriented analysis as it enables the quantification of network

In line with this perspective, video recordings of participants' task performance were used as the unit of analysis, and participants' behaviors were coded into discrete behavior units. The interaction with the AI music generation tool was categorized into three types of actions (see <Table 2>). First, music selection included playing music, regenerating, stopping playback, and selecting playback segments. Second, adjustment included modifying the mixer, melody, backing elements, bass, drums, fill-in, track length, BPM, instruments, key, and volume. Third, exit included inactivity and 'go back'. Based on these coded data, ENA networks were constructed to analyze differences in interaction patterns between groups. The coding process was conducted collaboratively by two independent coders to ensure consistency and reliability.



<Table 3> Codebook of analysis interaction with AI

Category	Code	Description
Music Selection	Play music	Playing the generated music output (e.g. Clicking the play button to listen to the generated track)
	Regenerate	Generating a new version of music using AI (e.g. Clicking the generate button)
	Stop music	Stopping the playback of generated music (e.g. Clicking the stop button during playback)
	Select playback section	Selecting a specific segment of the generated music for playback (e.g. Looping a certain part of the track)
Adjustment	Mixer	Modifying mixing settings (e.g., changing the relative intensity levels of all backing panels)
	Melody	Changing melody-related parameters (e.g., adjusting melodic intensity and prominence)
	Backing	Adjusting harmonic accompaniment intensity and textural density
	Bass	Modifying bassline intensity and rhythmic prominence
	Drum	Adjusting drum pattern intensity and rhythmic activity
	Fill-in	Modifying the frequency or presence of transitional rhythmic fill-ins
	Length	Changing the overall track duration
	BPM	Adjusting the tempo of the generated music
	Instrument	Changing the instrumentation of selected musical components
	Key	Modifying the tonal key of the composition
	Volume	Adjusting the overall output loudness of each session (melody, backing, bass, drum, FF, FE)
Exit	Inactivity	Periods with no observable interaction
	Go-back	Returning to the initial state to initiate a new music generation process

Finally, thematic analysis, as proposed by Braun and Clarke (2008), was applied to analyze the interview data. The researchers first familiarized themselves with the data by repeatedly reading the interview transcripts. Initial codes were then generated based on meaningful and recurring patterns in the data, and similar codes were compared and grouped into overarching themes. The derived themes were reviewed for consistency with the overall dataset, and each theme was assigned a clear definition and label. The results for each theme were subsequently described in detail based on participants' interview responses, and these qualitative findings were interpreted in conjunction with the behavioral analysis of the task performance.

IV. Results

1. Differences in interaction with AI between composition majors and non-majors

A total of 20 participants’ task performance processes were coded, resulting in 3,408 discrete behavioral units. The distribution of participants’ interaction behaviors across the three coded categories—music selection, adjustment, and exit—was compared between the composition majors and non-majors. As shown in <Table 4>, adjustment-related behaviors accounted for the largest proportion of interactions in both groups, with the composition majors demonstrating a slightly lower proportion (51.2%) compared to the non-majors (54.3%), although this difference reached statistical significance ($t = 1.83, p = .049$). Music selection behaviors were observed more frequently in the non-majors (43.9%) than in the composition majors (39.0%), while exit-related behaviors, including inactivity or returning to a previous generation state, occurred at similarly low rates in both groups (1.8%).

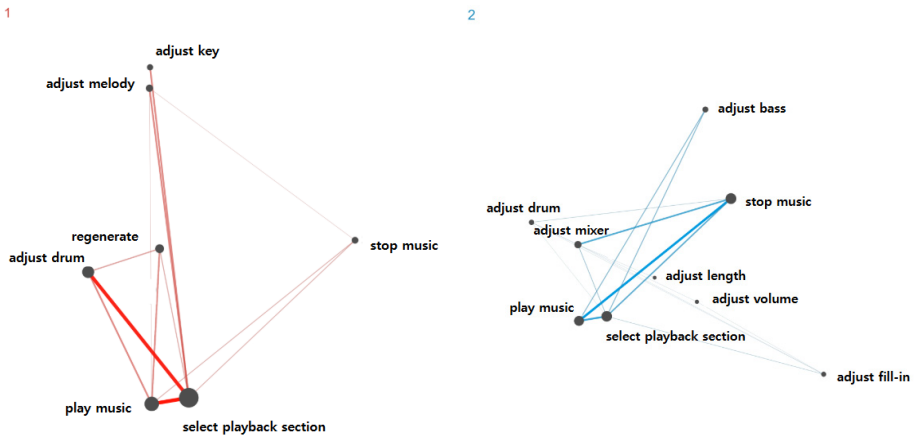
<Table 4> The differences of interaction pattern between composition-major group and non-composition-major group

Construct	Composition-major group		Non-major group		<i>t</i>	<i>p</i>
	Count	%	Count	%		
Music Selection	736	39	667	43.9	0.41	.057
Adjustment	1117	51.2	826	54.3	1.83	.049*
Exit	34	1.8	28	1.8	1.0	.250
Total	1887	100	1521	100	1.67	.057

* $p < .05$, ** $p < .01$, *** $p < .001$

[Figure 2] presents a visualization of participants’ interaction behaviors with the AI music generation tool using ENA. The results revealed statistically significant differences in the interaction network structures between the non-majors and the composition majors ($r = 0.76, p = 0.01$), indicating that the two groups exhibited distinct patterns of interaction despite using the same AI tool. The composition majors demonstrated the strongest interaction patterns among ‘play music - stop music - select playback section’, as well as between ‘adjust mixer - stop music - select playback section’. In addition, this group showed a broader range of interaction

pathways involving adjustment behaviors such as modifying bass, track length, volume, and fill-in, compared to the non-majors. In contrast, the non-majors exhibited a different interaction pattern. The strongest connections were observed among ‘play music - adjust drum - select playback section’, while interaction pathways involving ‘regenerate’ also demonstrated stronger associations relative to the composition majors. Additionally, connections between ‘select playback section - adjust melody’ and ‘select playback section - adjust key’ were clearly identified, although the density of links among adjustment nodes was comparatively lower than the composition majors. In other words, the composition majors were characterized by iterative monitoring and fine-grained modification, whereas the non-majors exhibited a stronger tendency toward exploratory engagement through regeneration and reselection.



[Figure 2] Network models of interactions by groups
(1=non-composition-major group, 2=composition-major group)

Specifically, analysis of the Think-Aloud protocols during the adjustment process revealed differences in how learners interpreted creative outputs based on their prior experience. These differences were consistently observed in the ways learners evaluated and modified the music generated by AI systems.

The non-majors tended to respond primarily to the overall impression and immediate affective quality of the generated output, often relying on repeated regeneration as a strategy. For instance, utterances such as “What is this? ... [clicks ‘regenerate’] ... I do not think this one works either ... [clicks ‘regenerate’] ... this one is even less suitable ...” (NC04) and “This one is not really appealing ... maybe I should try another one ... [clicks ‘regenerate’] ... this also does not seem

very good ... [clicks ‘regenerate’] ...” (NC07) suggest that, when the output failed to meet their expectations, non-majors were more likely to generate new alternatives than to make detailed modifications to specific musical elements. This pattern may be interpreted as indicating that they processed the music primarily in terms of affective impressions or surface-level features rather than structural components.

In contrast, composition majors were more likely to interpret the generated music within a hierarchical structural framework and to evaluate and revise the output with reference to specific musical components. Rather than relying solely on general preference, they engaged in cognitive processes that involved interpreting and adjusting the music with attention to higher-level structural features such as tonality, harmonic progression, formal development, and sonic balance. Utterances such as “Everything else is fine, but the off-beat feel of the guitar keeps bothering me” (CM03) and “The chords are not bad—they descend in a fairly good way—but maybe I should raise the bass because it is not really audible” (CM05) illustrate that the composition majors did not judge the generated music merely at the level of whether it sounded good or bad. Instead, they evaluated and modified the output based on specific criteria, including musical development, harmonic progression, and textural balance.

These differences correspond consistently with the patterns of connections among detailed adjustment nodes identified through ENA. Composition majors tended to initiate their work with consideration of elements such as musical development, structure, and chord progression even prior to engaging with the tool, suggesting that the refinement of internal generative models shaped through prior experience and training may influence their mode of creative interaction with generative AI.

2. Students’ perceptions of music composition with AI

Students’ perceptions of music composition with AI were qualitatively analyzed through semi-structured interview data to identify recurring themes related to their experiences in AI-assisted creative processes. The analysis revealed a set of shared perceptions across both groups, including a limited sense of human-AI collaboration, awareness of the value of articulating personal intention, concerns about formulaic results stemming from AI-generated data, and perceived efficiency gains in composition. In addition, group-specific perceptions were identified. The composition majors reported perceived unnaturalness of AI-generated music and recognized its usefulness for initial idea generation, whereas the non-majors perceived the generated music as

natural and reported a greater ease of engaging in the composition process.

<Table 5> The theme of interview analysis

Category		Theme
Shared perceptions across groups		• Limited sense of human-AI collaboration • Awareness of the value of articulating personal intention • Perceived efficiency gains in composition
Divergent perceptions across groups	Composition-major group-specific perceptions	• Perceived unnaturalness of AI-generated music • Perceived usefulness for initial idea generation • Concerns about formulaic results stemming from AI data
	Non-major group-specific perceptions	• Perceived naturalness of AI-generated music • Perceived ease of engaging in composition

1) Shared perceptions of music composition with AI across groups

Participants reported that they did not experience the music composition process with AI as a collaborative interaction between human and AI agents. In particular, interacting with the system primarily through selecting pre-defined options did not provide a meaningful sense of cooperation or joint creative engagement. Instead, participants described the process as either passively following AI-generated suggestions or creating music independently through a series of clicks. Accordingly, some participants expressed a preference for a more conversational, ChatGPT-like interface that would allow them to articulate their creative intentions more explicitly, support co-creation of musical outputs, and provide guidance in using the compositional tools. The sense of collaboration appears to be constructed primarily through UI/UX design rather than the underlying task procedure.

This perception was also associated with functional constraints of the system. Especially among participants in the composition-major group, the relatively low technical sophistication and insufficient musical detail of the generated outputs limited their ability to adjust or structurally refine the music in accordance with their artistic intentions. As a result, despite their desire to exert greater creative agency during the composition process, participants had trouble in meaningfully intervening in the generated outputs, which in turn contributed to a diminished sense of collaborative control in human-AI co-creation.

What I initially expected was to be able to create music by having a conversation with the AI.

For example, I thought I could say something like, “Make a song in this genre with this kind of mood,” just like I do with ChatGPT, and then the AI would generate a song based on that. I imagined that I could then talk about which parts I liked or didn’t like through chat, and the AI would revise the music accordingly (NM06).

This is also kind of related to the issue of diversity, but I was thinking it would be nice if there were some tools that allowed more interaction or communication with the AI during the composition process (CM10).

Participants also recognized that music composition is a process of expressing one’s thoughts and emotions through sound, and that a clear sense of what one intends to convey is also necessary in AI-assisted composition. Effective use of AI-based composition tools was perceived to depend on the ability to identify and articulate desired stylistic or emotional characteristics in advance. This tendency was reflected in differences in how participants approached the composition task. Composition majors formed expectations based on structural elements such as chord progression and overall formal development prior to generation and subsequently evaluated the generated outputs in relation to these structural intentions. In this process, they perceived that clarifying their creative intentions in advance played an important role in achieving more satisfactory outcomes. In contrast, participants in the non-majors tended to form expectations based on general impressions such as genre or mood, which led to a lack of criteria necessary for adjusting or refining the generated outputs during the composition process. These findings suggest that the ability to recognize and explicitly articulate one’s creative intentions in advance is a critical prerequisite for effective human-AI collaborative composition.

I noticed that once I selected the right mood, I was able to get closer to the style I wanted. Thinking about this program and other AI tools I’ve used, like ChatGPT, if I give clear and specific instructions, they’re usually able to provide what I’m looking for to some extent (CM03).

I could definitely feel that using this tool significantly reduced the time needed, but since I wasn’t exactly sure what I wanted, I had to spend some time figuring it out, which is probably why the 15-minute time limit felt a bit short (NC04).

Participants in both groups further identified efficiency as a major advantage of AI-assisted composition. Non-composition major participants positively evaluated the ability to generate

plausible musical outputs with only a few interactions, even without formal musical expertise. Participants in the composition majors also recognized that, when composing music using a digital audio workstation, manually inputting and arranging individual instruments typically requires a considerable amount of time. In contrast, AI-assisted composition environments enabled the rapid generation of initial outputs, thereby improving overall time efficiency in the composition process.

In particular, AI-generated music was perceived to function as a form of reference during the early stages of composition, helping to narrow the range of options and support initial decision-making. While identifying and selecting appropriate drum patterns or instrumental sources (e.g., MIDI packs) often demands substantial effort in traditional workflows, AI systems were found to automatically arrange harmonically compatible elements, thereby simplifying this exploratory process. Furthermore, when the generated output did not meet expectations, participants could easily produce alternative versions within the same genre through regeneration, effectively reducing the time spent searching for suitable references.

First of all, the fact that the entire creation process took less than 15 minutes made it feel very efficient. Spending too much time can make the outcome feel unsatisfactory compared to the effort invested. In that sense, being able to save time was the most satisfying aspect (NC07).

Overall, the process was overwhelmingly convenient with AI. If I had done it myself, it would have taken about one to two weeks, working on it little by little. But with AI, an initial result was generated right away, which I found very beneficial (CM03).

2) Divergent perceptions of music composition with AI across groups

(1) Composition major group's specific perceptions of music composition

Participants in the composition majors were more likely to critically evaluate AI-generated music rather than accept it on the basis of general impression. Their evaluations were grounded in criteria such as developmental logic, structural flow, expressive detail, sonic balance, and instrumental arrangement. In particular, repetitive melodic patterns, monotonous harmonic progressions, and timbral qualities were often perceived as signs of mechanical production or musical incompleteness.

It feels very mechanical because the same melody keeps repeating throughout the track. In addition, the sound feels unfinished. It feels like a flashy shell without inner substance (CM07).

At the same time, participants consistently identified the usefulness of AI-based music generation tools for initial idea generation as one of the most valuable aspects of the composition process. Many noted that AI-assisted systems helped reduce the difficulty of getting started, which is often regarded as one of the most challenging stages of creative work. By providing an initial output, the AI enabled users to move beyond the blank-page problem and to develop subsequent ideas from a generated starting point, thereby functioning as a form of collaborative draft that supported further creative exploration. In particular, AI-generated music was perceived as a useful reference in the early stages of composition, helping participants narrow down options and make initial decisions. In traditional workflows, identifying and selecting appropriate drum patterns or instrumental sources, such as MIDI packs, often requires considerable effort. By contrast, the AI system was perceived as simplifying this process by automatically arranging harmonically compatible elements. Even when the generated output did not meet expectations, participants noted that alternative versions could be easily regenerated within the same genre, thereby reducing the time required to locate suitable references.

When I listen to it piece by piece, that's when it kind of feels like something is being made, but then there's this other section in the middle and I start wondering, did this get recorded wrong? And as I keep listening, I'm like, why does this part just disappear? So unless you're really experienced—or if you're someone who's mixing and maybe lowered one track or split the project—it can come across as a bit distorted, like something's missing (CM04).

These perceptions were also linked to concerns about the typicality and conventionality of AI-generated outputs. Participants pointed out that, because AI systems are trained on existing human-generated data, their outputs tend to remain within familiar and conventional stylistic boundaries, even when they appear broadly accessible. Some further noted that AI-generated themes or riffs were often confined to common genre-based patterns, making it difficult to expect the kind of novel and unconventional experimentation that could enhance artistic value. Overall, the composition majors tended to regard AI outputs not as finished artistic products, but as materials requiring further refinement through human critical interpretation and creative elaboration.

The themes that AI generates tend to be very typical. When you listen to them, they feel like they're confined within the common characteristics of a genre. (...) A big turning point in how music evolves comes from bringing in different riffs or themes and twisting ideas that already

existed. The music industry really grew when something unexpected, something that wasn't typical, came out (CM02)

(2) Non-composition-major group's specific perceptions of music composition

The non-majors tended to perceive AI-generated music as relatively natural and acceptable. Rather than evaluating the outputs on the basis of specific criteria such as chord progression, mixing, or structural development, they tended to rely on overall auditory impressions, describing the music as "natural," "harmonious," or "plausible." For example, NC02 stated that, because they were not an expert, the output simply sounded good to them, and that the generated music felt very natural and harmonious even without any knowledge of chords or melody. This suggests that the non-majors assessed the naturalness of AI-generated outputs primarily at the level of overall atmosphere and impression rather than in terms of structural completeness.

Since I'm not an expert, I think it just ends up sounding good to me. ... It felt very natural and harmonious even though I don't know anything about chords or melody (NC02).

In addition, the non-majors strongly perceived AI-based music generation tools as lowering the barriers to participation in composition. This indicates that, for non-majors, AI functioned not merely as an automatic generation tool, but also as an entry point that reduced the sense of burden or distance often associated with traditional music education. Accordingly, for the non-majors, AI was experienced less as a tool that constrained creative agency than as an accessible means of enabling participation in composition.

Even without knowing anything about chords or music theory, I was able to create something that sounded quite plausible. I really love this. Thanks to this platform, I don't feel afraid of music anymore, and I think I'll be using it more often in the future (NC08).

V. Discussion and Conclusion

This study examined how music composition majors and non-composition majors interact with an AI-based music generation tool and how their musical backgrounds influence their creative behaviors, perceptions, and evaluations. The integrated findings suggest that the differences

between the two groups were not primarily reflected in their levels of engagement or attitudes toward AI, but rather in the cognitive structures and strategies through which they organized their interaction with the system. The findings of this study are discussed as follows.

1. Discussion

The findings of this study suggest that the observed differences between composition majors and non-majors were not primarily reflected in their level of engagement with the AI system, but in the cognitive structures through which they organized their interaction during the creative process.

Specifically, differences emerged in how learners monitored and adjusted AI-generated outputs during task execution. While both groups actively interacted with the system, composition majors tended to interpret the generated outputs within a hierarchical structural framework and progressively refine them through iterative modification of specific musical elements. In contrast, non-major participants were more likely to rely on overall perceptual impressions and adopted strategies such as accepting the generated output or regenerating alternatives when dissatisfied. These patterns indicate that the two groups differed not simply in the extent of interaction, but in the strategies through which they regulated the interaction process.

Notably, the composition majors employed adjustment strategies more frequently than the non-majors, yet reported higher levels of dissatisfaction with the generated outputs, often describing them as “unnatural.” This finding aligns with prior research indicating that increased interaction with AI does not necessarily lead to greater user satisfaction, particularly when users hold more refined mental models and expectations about system behavior (Liu, 2025; Rafner et al., 2025). This paradox suggests that increased interaction with AI does not necessarily lead to more positive creative experiences, and that simply encouraging greater use of AI tools may not guarantee effective creative performance (Desdevises, 2025). Rather, it highlights that what matters in human-AI collaboration may not be the quantity of interaction, but how users interpret, regulate, and adjust AI-generated outputs during the creative process (Rafner et al., 2025).

From a human-AI collaboration perspective, differences in prior musical experience appear to shape not the extent of interaction with AI systems, but the manner in which learners interpret, regulate, and evaluate AI-generated outputs throughout the creative process. Experts are known to exhibit heightened sensitivity to structural violations in tonal and harmonic organization, and within a predictive processing framework, such expertise may correspond to increased sensitivity

to prediction errors at higher levels of structural representation (Fedorenko et al., 2012; Vuust et al., 2022). This distinction was reflected in evaluative criteria: non-majors tended to assess AI outputs based on functional appropriateness or affective impressions, whereas composition majors focused on structural coherence, including tonal organization, harmonic progression, and formal development. These differences likely stem from variation in the refinement of learners' internal generative models, as those with more structured musical experience possess more elaborated expectations regarding tonal and formal relationships. Consequently, composition majors may engage in more frequent adjustments during collaboration with AI while simultaneously reporting lower satisfaction with generated outputs due to heightened sensitivity to structural inconsistencies.

In addition, the present study suggests that the experience of human-AI collaboration cannot be understood independently of the structure of the tool itself. Although both groups recognized the efficiency of the AI system and its usefulness for idea generation, they reported only a limited sense of human-AI collaboration. This pattern appears to be related not only to learners' attitudes but also to the characteristics of Soundraw as used in this study. Specifically, the tool functions less as a dialogic collaborative system and more as an instrumental system centered on parameter selection and adjustment.

This interpretation is consistent with prior research indicating that, in human-AI co-creation contexts, AI is often perceived not as an equal creative partner but as a tool or assistant, and that the interaction process is highly dependent on interface design and governed by users' explicit control (Liu et al., 2025; Zhang et al., 2025). Accordingly, the human-AI collaboration observed in this study is better understood not as a form of dialogic co-creation between equal partners, but as a human-in-the-loop regulatory process in which the human primarily selects, evaluates, and modifies AI-generated outputs.

2. Pedagogical implications of AI-based music composition

The findings of this study suggest that generative AI-based music learning should be understood as a learning environment that requires different forms of participation and support depending on learners' musical backgrounds and levels of preparedness. As the present findings are exploratory and derived from a small sample of university students using a specific parameter-based AI music generation tool, the following implications should be interpreted cautiously as provisional considerations for the design of future AI-assisted music learning.

First, AI-assisted music learning should be designed not to require a uniform mode of use

from all learners, but to allow for differentiated pathways of participation according to learner level. The findings of this study indicate that differences between learners were more clearly reflected not in the sheer amount of use, but in the criteria through which they interpreted and regulated generated outputs. In this respect, the goal of AI-integrated instruction should not be to bring all learners toward the same mode of performance, but rather to help each learner progressively refine the ways in which they interpret and use AI-generated results at their current level of development.

Second, instructional support for non-majors or beginners should focus on helping them transform sensory or affective responses into more specific musical judgments. For such learners, impression-level reactions such as “I like it” or “I do not like it” may serve as the primary starting point for creative decision-making; accordingly, teachers need to provide question structures that help translate such reactions into grounds for selection and revision. For example, questions such as “Which part sounds awkward?”, “Which section sounds repetitive?”, and “What does not match the intended mood?” may help learners convert their responses into more explicit evaluative criteria. In addition, activities that encourage learners to modify one element before choosing regeneration may help them experience AI outputs not as finished products but as materials open to adjustment (Wolcott & Lobczowski, 2021). This form of support is important because it frames non-majors not as learners at an immature stage of major-level expertise, but as learners who interact with AI in different ways and therefore require different forms of participatory support.

Third, for intermediate learners, pedagogical mediation that connects affective language with structural language is important. Because AI systems generate outputs on the basis of user input, learners who lack a clear sense of their own musical goals or intentions may have difficulty making effective use of generated results (Kim, 2025). Accordingly, activities are needed that link impression-based language such as “calm,” “it feels like it suddenly breaks off,” or “the chorus feels empty” to adjustable musical elements such as rhythmic density, instrumental arrangement, harmonic change, and modes of development. For example, when a learner remarks that “the middle section suddenly feels empty,” this should not be treated merely as an impressionistic response but can instead be connected to such elements as a reduction in the number of instruments, a sharp decrease in rhythmic density, or weakened formal continuity. Such processes may help learners gradually transform their impressions into more structured criteria for revision and expand their interaction with AI from the level of selecting results to the level of comparing, analyzing, and modifying them (He & Ren, 2025; Ou et al., 2025; Zhou

et al., 2025).

Fourth, composition majors or more advanced learners require more critical and structurally oriented tasks of reconstruction. What such learners need is not basic guidance in how to use the tool, but higher-order tasks that require them to analyze the structural validity of AI-generated outputs and design alternative versions. For example, when a generated chorus feels excessively repetitive, learners may be asked not simply to regenerate another result, but to redesign the tension-release structure by altering the bass line, extending the harmonic progression, or reorganizing the instrumental texture. Such activities encourage learners to treat AI-generated outputs not as completed products but as objects of analysis and transformation, as well as compositional resources, thereby contributing to the development of more refined creative regulation skills in the context of human-AI collaboration (Bigand & Poulin-Charronnat, 2006; Tchemmeube et al., 2025; Zhou et al., 2025).

Fifth, what is commonly important for learners at all levels is support that helps them understand the roles of humans and AI in complementary terms and clarify their creative intentions in advance. Effective human-AI collaboration requires more than the functional ability to operate a tool; it also demands an understanding of the operating principles and limitations of AI systems, the ability to organize one's creative intentions in forms that AI can process, and the capacity to critically interpret and regulate generated outputs (Yoo et al., 2024). In addition, even learners with high levels of task competence may fail to make full use of AI tools because of negative perceptions of AI or automation, and teachers therefore need to help learners understand AI not as a substitute for human creativity but as a complementary partner that supports exploration and generation (Kim et al., 2022). To this end, instruction may include activities that ask learners to describe the genre, mood, anticipated audience, context of use, and overall structure of a piece before composing, or to explain why they chose regeneration in some moments and revision in others (He & Ren, 2025; Kim, 2025; Wolcott & Lobczowski, 2021). For example, asking learners to design the overall form of a piece in advance while allowing AI to generate diverse sonic possibilities within that structure may help them experience the respective roles of human and AI more clearly (Kim & Park, 2025). Likewise, activities that require learners to reconstruct rhythmic patterns or instrumental arrangements based on AI-generated harmonic progressions may make more explicit a collaborative structure in which AI performs exploratory and generative functions while the human assumes interpretive and structural responsibility (Tipei et al., 2021; Zhao et al., 2025).

Sixth, AI-based creative instruction should be organized not merely to increase the efficiency

of product generation, but to deepen learners' musical understanding. When AI-based creative activities are implemented in isolation from broader musical learning experiences, they risk being reduced to surface-level production tasks centered on output generation (Jung et al., 2024; Yun, 2024). Accordingly, AI-assisted music learning acquires greater educational significance when it is connected to experiences of recognizing, interpreting, and reconstructing musical concepts such as form, development, tension and release, and instrumental arrangement. For example, after analyzing formal principles such as ABA form in a listening lesson, students may be guided to identify similar structural patterns in AI-generated works or to modify them deliberately (Aperstein et al., 2025). In this sense, AI-based creative instruction gains stronger pedagogical significance when it functions not simply as a means of facilitating production, but as a medium for extending musical thinking and structural inquiry (Yun, 2024).

In sum, the findings of this study suggest that the core of AI-assisted music learning lies not in requiring all learners to adopt the same strategy of use, but in recognizing differentiated pathways of participation according to learner level and in providing staged support for the verbalization of sensory judgment, the formation of structural criteria, and the enactment of critical revision and reconstruction. In particular, the distinctive contribution of this study lies in showing that differences among learners in generative AI-based music learning are not reducible to frequency of use or general attitude but are more specifically reflected in differences in participatory pathways and regulatory strategies for handling AI-generated outputs. This perspective makes it possible to reinterpret non-majors not through a deficit-based comparison with composition majors, but as learners who collaborate with AI in different ways, thereby opening further discussion of more refined and differentiated designs for AI-assisted learning in music education.

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