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DEVELOPING MUSICAL AND AESTHETIC CULTURE THROUGH MODERN TECHNOLOGIES

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Abstract: This article explores the pedagogical conditions for developing musical and aesthetic culture in preschool children through the use of modern technologies. The effectiveness of multimedia tools, interactive educational programs, digital musical instruments, the STEAM approach, and integrated music game technologies is analyzed. The study reveals how innovative technologies enhance children's musical perception, sense of rhythm, aesthetic sensitivity, creative expression, and collaborative musical engagement. The article also discusses pedagogical requirements, innovative strategies, and practical methods for integrating modern technologies into early childhood music education.

Key words: musical-aesthetic culture, modern technologies, music education, interactive methods, multimedia, digital instruments, rhythm, perception, STEAM, innovative pedagogy.

Developing musical–aesthetic culture in preschool children is one of the key components of their holistic personal development. Music performs several important functions in early childhood: regulating emotions, supporting language and speech development, strengthening motor and social skills, and shaping aesthetic taste. While traditional methods of musical education remain effective, integrating them with modern information and communication technologies, multimedia tools, and digital applications elevates musical–aesthetic education to a new qualitative level. Digital tools expand opportunities to capture children's attention, visualize complex concepts, build individual learning trajectories, and stimulate creative activities.

Modern technologies play various roles in developing musical perception, rhythm sensitivity, auditory memory, and the ability to differentiate timbre. For instance, animated videos help children perceive the mood of music visually, enhancing their emotional responsiveness. Through touch-screen devices and interactive games, children engage in rhythmic tasks, sound synthesis, and melody creation, which contribute to practical skills and the development of independent creative thinking. Digital instruments (mini synthesizers, electronic metallophones,

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virtual instruments in mobile apps) allow children to experience music-making even without technical mastery, supporting their performance culture and technical growth.

The STEAM approach—integrating science, technology, engineering, art, and mathematics into music—is particularly effective in preschool musical education. Explaining rhythmic patterns and meter using mathematical concepts, connecting sound speed and pitch with physical principles, applying engineering skills when tuning electronic instruments, and creating artistic imagery through the art component contribute to the development of complex thinking. For example, repeating rhythmic patterns and creating more complex structures is not only a musical task but also a mathematical exercise; using a digital synthesizer to modify simple sounds helps children understand technological principles in a practical way.

Using modern technologies for pedagogical purposes must comply with several important conditions.

- First, the selected tools and applications must match children's age and psychomotor characteristics; interfaces that are too abstract or complex can distract or overwhelm young learners.

- Second, technology must support the main goal—musical–aesthetic education—rather than becoming an end in itself.

- Third, lessons should be structured step by step: introductory listening, guided practice, and independent creative tasks. This sequencing increases pedagogical effectiveness.

- Fourth, emotional overload should be avoided; excessive visual and audio stimuli can tire children and reduce attention. Therefore, multimedia elements should be used moderately and purposefully.

- Fifth, educators must possess digital and methodological competence, consistently updating their knowledge of applications and teaching methods.

Modern technologies can be implemented in preschool classes through several practical methodological strategies. Lesson plans should clearly identify interactive components.

For example, a 40-minute lesson may include:

1. 1–5 minutes — engaging visual/audio introduction (animation or short video)

2. 5–15 minutes — listening and recognition tasks (comparing melodies, identifying rhythms)

3. 15–30 minutes — interactive practice (creating rhythms on a touch screen, performing on a virtual instrument, composing simple pieces)

4. 30–38 minutes — creative group tasks (staging a melody or creating a musical story)

5. 38–40 minutes — brief reflection and assessment

At each stage, the role of technology and the pedagogical objectives must be clearly defined.

Examples of effective activities include:

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✓ **"Rhythm Journey" —** using an interactive screen to display different animals' walking rhythms; children reproduce the rhythms using simple instruments (sticks, flutes, percussion) and create a group rhythmic scene.

✓ **"Colors of Melody" —** animated clips assign colors to different musical tones; children match movements to the changing colors and express their feelings verbally.

✓ **"Electronic Orchestra"** — using applications such as GarageBand, children take on different instrument roles and create short compositions, while the educator encourages participation. These activities also integrate STEAM components: rhythmic patterns relate to mathematics, timbre and pitch relate to physics and technology, and creative expression relates to art.

Assessment and monitoring are essential. Both quantitative and qualitative indicators should be used. Quantitative indicators include: accuracy in repeating rhythms, the number of correct responses in distinguishing melodies, and the time required to complete independent tasks. Qualitative indicators include: the level of creative expression (imagery, emotional coherence), collaboration during group activities, and the aesthetic quality of performance. Developing rubrics—for example, a 1–4 point scale (1 = initial level, 4 = advanced level)—can help standardize assessment. Based on monitoring results, the educator can adjust instruction, provide individual support, or modify subsequent lessons.

Challenges in applying technology should also be considered. Limited technical resources, weak internet connectivity, and insufficient availability of devices are common issues in many preschool institutions. In such cases, educators may rely on offline resources, simple electronic tools (portable speakers, USB music modules), and a balanced combination of traditional methods (songs, rhythmic games) with digital elements. Engaging parents can further support the process by continuing musical activities at home and helping acquire necessary equipment.

Practical experiences from leading educational institutions show that using interactive learning platforms improves children's rhythm and auditory perception skills. Additionally, technology-supported group projects positively influence social competencies such as collaboration, listening, and mutual support. These experiences serve as a valuable foundation for developing methodical recommendations for educators.

In conclusion, modern technologies are highly effective pedagogical tools for shaping musical–aesthetic culture in preschool children. For successful implementation, it is essential to ensure age appropriateness, alignment with educational goals, structured lesson design, educators' methodological and digital readiness, and a systematic assessment framework. STEAM integration situates musical education within a broader scientific and creative context, promoting complex thinking and independent creativity. This approach supports the sustainable and profound formation of musical–aesthetic culture in preschool children.

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