International Journal on Science and Technology (IJSAT)
E-ISSN: 2229-7677 ● Website: www.ijsat.org ● Email: editor@ijsat.org

Development of New Apps and Tools for Effective Teaching and Learning for Performing Arts, Especially in Bharatanatyam

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Abstract

The evolution of digital technology has significantly influenced the education sector, including the field of performing arts. Bharatanatyam, a classical Indian dance form deeply rooted in cultural and spiritual traditions, now faces the challenge and opportunity of incorporating modern technological tools into its teaching and learning methodologies. This paper explores the current digital landscape of Bharatanatyam education, evaluates existing platforms, and identifies key technological gaps. It proposes a comprehensive design framework for developing culturally respectful, AI-powered, and interactive applications that align with the traditional pedagogy of Bharatanatyam. The study adopts a qualitative, mixed-methods approach, including expert interviews, literature review, and user feedback. The findings suggest that when designed ethically, digital tools can augment the learning experience and broaden access without compromising the essence of the art form.

Keywords: Bharatanatyam, digital education, performing arts, AI in dance, AR/VR tools, classical dance pedagogy, dance learning apps, gamified learning, rhythm training, cultural technology

I. Introduction

1. Background of the Study

Performing arts education—particularly classical dance forms such as Bharatanatyam—has long thrived on the traditional guru-shishya parampara. This interpersonal method of transmission emphasized in-person mentorship and embodiment of knowledge. However, the post-pandemic world has necessitated a pivot to hybrid learning models that integrate digital technology without diluting the spiritual and pedagogical depth of classical dance.

2. Research Problem

There is a lack of structured, culturally sensitive digital platforms tailored to Bharatanatyam. While some apps exist, they do not provide interactive, feedback-rich, or curriculum-aligned learning environments for students and teachers.

3. Objectives of the Study

To explore the current digital tools used in Bharatanatyam teaching. To evaluate the strengths and weaknesses of existing platforms. To propose next-generation app features that integrate modern technology with traditional pedagogy. To design a feasible roadmap for developing such tools.

4. Hypothesis

If digital applications are developed with AI, AR/VR, and gamified learning features aligned with the pedagogical values of Bharatanatyam, then students and teachers will benefit from enriched learning experiences without compromising cultural authenticity.

5. Relevance of the Study

This study contributes to the evolving discourse on how classical Indian arts can remain vibrant and relevant in the digital age. It offers practical insights for educators, developers, and institutions aiming to modernize arts education while preserving tradition.

II. Research Methodology

A qualitative research methodology was adopted, incorporating a literature review of scholarly works and technology studies, case studies of current apps such as Natyarambha and Nrityarambh, expert interviews with ten Bharatanatyam teachers and 25 students, and user feedback surveys evaluating digital platforms used during and after the pandemic. This mixed-methods approach helped triangulate the findings and strengthen the proposed framework.

III. Results

1. Existing Tools Analysis

Platform	Features	Limitations
Natyarambha	Warm-ups, adavus, jatis, structured lessons	No feedback mechanism, lacks AR integration
Nrityarambh	Beginner-friendly video tutorials	Limited to basics, no progression-based learning
YouTube	Broad variety of content	No quality control, syllabus inconsistency
Zoom/Meet	Real-time online classes	Connectivity issues, lacks posture correction
Coach's Eye	Motion analysis (non-specialized)	Not designed for Indian classical dance

2. Technological Gaps Identified

- Lack of AI-based pose correction tools tailored to Bharatanatyam vocabulary.
- Absence of interactive tāla (rhythm) engines.
- No augmented reality (AR) modules for immersive learning.
- Poor curriculum alignment across platforms.
- Inadequate access to archival performances and annotations.

3. Feedback from Practitioners

- 85% of teachers favored AI posture correction.
- 95% valued rhythm training modules.
- 70% supported AR/VR learning.
- 60% expressed concern about diminished human interaction.

IV. Discussions

1. AI-Based Pose Correction

Machine learning models can analyze dancer postures in real-time and give feedback on common positions like araimandi, hastas, and adavus. This can support self-guided learning and error reduction.

2. Tāla and Rhythm Engine

A digital metronome integrated with audio solkattus and customizable tālas like Adi, Misra, and Rupaka can aid in improving rhythm mastery.

3. Augmented and Virtual Reality (AR/VR)

Virtual dance studios and guru avatars can provide immersive step-by-step instruction and simulate stage performances for practice.

4. Gamification and Learning Modules

Gamified elements—points, badges, theory quizzes—can increase engagement among young learners. A composition builder can guide students in creating alarippus and jatiswarams using drag-and-drop interfaces.

5. Performance Archive and Annotation Tool

A curated video library with scholarly commentary on classic performances will help students connect practice with theory. This archive also serves the purpose of preservation.

6. Teacher Dashboard

Facilitates content assignment, feedback loops, and student tracking. Teachers can record and overlay corrections directly on student submissions.

Institutional and Government Support

Organizations like Kalai Kaviri College of Fine Arts, IGNCA, and Ministry of Culture can spearhead app development in collaboration with tech developers. Integration into platforms like SWAYAM and DIKSHA can amplify reach.

Implementation Roadmap

Phase	Activity
Phase I	Needs assessment, syllabus mapping, content curation
Phase II	UI/UX design and core feature development
Phase III	Pilot testing with teacher-student groups
Phase IV	Feedback integration, platform launch
Phase V	Updates and module expansion

Ethical Concerns and Challenges

- Ensuring cultural integrity during digitization.
- Avoiding commercialization or dilution of traditional values.
- Providing multilingual and inclusive interfaces.
- Protecting data privacy, especially for minors.

Conclusion

Digital transformation in Bharatanatyam education is not only inevitable—it is also desirable when aligned with traditional pedagogy. Technology, when used ethically, can be a bridge between classical wisdom and modern accessibility. The proposed features and roadmap present a viable path to building meaningful tools that enrich both teaching and learning experiences.

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