

USING MUSIC TO REDUCE CLASSROOM STRESS: INNOVATIVE PEDAGOGICAL STRATEGIES FOR MODERN TEACHER EDUCATION

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Abstract

This study aimed to examine the impact of music-based learning activities on reducing stress among teacher education students. The research was conducted in a teacher education college located in Jammu, involving 20 students selected through a random sampling method. The study was carried out in three stages. A five-point stress scale was used to measure the stress levels of the students during the pre-test, music intervention, and post-test. The intervention included instrumental practice, vocal exercises, and group singing sessions conducted over a period of 15 days. Statistical analysis was performed using mean, median, mode and ANOVA. This proves that music-based teaching strategies are effective in reducing the mental stress of students. The findings of the study also showed that music teaching not only reduced stress but also increased students' concentration, confidence, and interest in learning.

Keywords: Classroom Stress, Pedagogical Innovation, Music-based learning, Music Intervention

Introduction

Students mental well-being and emotional stability have become critical concerns in education. In today's competitive academic environment, students face a variety of mental pressures and stresses, which adversely affect their learning ability, concentration, and confidence. Especially in the field of teacher education, where students are prepared as future teachers, their mental balance and positive attitude are very important. Music is an essential aspect of human life, promotes emotional calmness, mental stability, and self-control. Integrating music into the learning process makes education more engaging, enjoyable, and less stressful for students. Music is not only a medium of entertainment, but it can also be an effective teaching tool that enhances the attention span, motivation, and participation of students. In this study, with the help of pre-tests and post-tests, it was measured what the musical intervention brings from the mental stress, concentration, and confidence of the students. This study presents an innovative approach in modern teacher education, through which the teaching process can be described as more humane, sensitive, and creative.

Historical background

In ancient India, there was a deep connection between education and music. In the Vedic period, the symbolized the synthesis of music and learning, where mantras were chanted with notes and rhythm to develop concentration and spiritual peace in the students. Music is also used in the Gurukula system of meditation. It was done for self-control. It was believed that music keeps the mind and brain balanced and enhances learning ability. The education system in modern times has become more exam-centric and competitive. This increased the pressure on the students. In this situation, music is emerging as an effective medium. Which can reduce mental stress and provide positive energy. Many studies conducted across the world have proved that music therapy is helpful in improving psychological health and maintaining emotional balance. In India, the use of music in the teacher's domain has largely been limited to co-curricular activities, with very little attempt to adopt it as a formal teaching tool in teacher education institutions. That is why the present study is a new effort in this direction. Which makes it clear that incorporating music into the teaching process can bring about significant reductions in the mental stress of students. This was done in the historical background. research into this idea. Music is not only a subject of art, but it is also an effective medium to make education more humane and sensitive. Music-based learning not only reduces stress but also boosts confidence, concentration, and self-esteem in students. It also promotes creative thinking.

Literature Review

1. Music as a Psychological Mechanism for Stress Regulation: A growing body of educational psychology positions music as a significant non-pharmacological intervention for stress and anxiety reduction in academic contexts. Within teacher education, music is increasingly conceptualized as a dual-function resource serving both therapeutic and pedagogical roles by facilitating emotional regulation and cognitive stabilization. Empirical evidence indicates that music exposure can significantly reduce anxiety and physiological stress responses. Research by Noh (2009) demonstrates that both vocal and instrumental music reduce anxiety levels, with instrumental forms showing comparatively stronger relaxation effects. Similarly, Downing et al. (2004) established that music-assisted relaxation improves cognitive processing efficiency and reduces stress-induced learning barriers.

From a broader psychological perspective, Hallam (2010) conceptualizes music as an affect-regulation system that supports emotional stability, motivation, and attentional control. Meta-analytic evidence by De Witte et al. (2022) further strengthens this position, confirming that music-based interventions produce statistically significant reductions in stress through neurophysiological and emotional pathways. However, while evidence strongly supports effectiveness, much of the existing research focuses on short-term interventions rather than sustained pedagogical integration, indicating a methodological limitation in longitudinal classroom-based applications.

2. Music-Based Interventions and Cognitive-Academic Enhancement: Beyond stress reduction, music has been widely associated with improved cognitive functioning and academic engagement. Studies suggest that music facilitates attentional control, memory encoding, and emotional readiness for learning. Downing et al. (2004) found that music-assisted relaxation improves comprehension and cognitive efficiency, while Rastogi and Silver (2014) reported reductions in examination anxiety alongside improved academic performance. Hallam (2010) further highlights music's role in enhancing intrinsic motivation and classroom engagement. A critical synthesis of these findings suggests that music operates not merely as a relaxation tool but as a cognitive scaffold that optimizes learning readiness. However, most studies remain limited to controlled environments, raising questions about ecological validity in real teacher education classrooms.

3. Teacher Stress, Praxis Shock, and Professional Identity Formation: Teacher stress is increasingly recognized as a structural issue in contemporary education systems, particularly among pre-service teachers experiencing "praxis shock" the transition gap between theoretical preparation and classroom realities. Gordon (2002) identifies classroom management and behavioral unpredictability as primary stressors in early teaching experiences. Similarly, Legette (1997) emphasizes the theory-practice disconnect in teacher preparation programs. Georgii-Hemming and Westvall (2010) and Raiber and Teachout (2022) extend this discussion by framing teacher identity as an evolving construct shaped by continuous adaptation, emotional negotiation, and experiential learning. Despite this recognition, Silveira and Diaz (2014) highlight a lack of robust empirical validation regarding how teacher education programs effectively mitigate stress during this identity formation phase. This reveals a critical gap in structured emotional-support pedagogies within teacher training systems.

4. Music Education as a Pedagogical and Discipline-Specific Domain: Music education uniquely integrates cognitive, emotional, and sensory domains, requiring both artistic proficiency and pedagogical competence. Unlike conventional disciplines, it involves active engagement through performance, listening, and creative expression. Abramo and Reynolds (2015) argue that pedagogical creativity enhances emotional resilience and instructional effectiveness in music teaching contexts. Hammel and Hourigan (2017) further demonstrate that adaptive and inclusive teaching approaches improve learner engagement and reduce anxiety across diverse student populations. However, pre-service teacher education programs often fail to integrate pedagogical methodology with musical expertise, resulting in a fragmented training experience. This structural gap contributes directly to classroom stress and identity uncertainty among novice teachers.

5. Utilitarian and Aesthetic Dimensions in Music Education: Music education operates within a dual ideological framework: utilitarian and aesthetic paradigms. The utilitarian perspective emphasizes measurable cognitive, emotional, and social outcomes, whereas the aesthetic perspective focuses on intrinsic artistic value and expressive experience. Current curriculum structures predominantly prioritize utilitarian outcomes, often marginalizing the experiential and creative dimensions of music learning. This imbalance creates pedagogical tension for teachers who must simultaneously meet assessment-driven objectives and maintain artistic authenticity. Such tensions contribute to emotional strain and instructional ambiguity, particularly among early-career educators navigating institutional expectations.

6. Technology Integration and Pedagogical Transformation: Digital transformation has significantly reshaped contemporary music education. Technology-enhanced learning environments provide new opportunities for engagement, creativity, and accessibility. Yao and Li (2023) demonstrate that while technology enhances engagement, teacher-guided instruction remains more effective than fully autonomous digital learning models. Conway (2020) emphasizes the need for inclusive pedagogical frameworks that integrate digital tools, updated assessment systems, and adaptive teaching strategies.

However, the integration of technology without pedagogical alignment may increase cognitive overload among both teachers and learners, potentially counteracting stress-reduction benefits if not carefully structured.

7. Cross-Cultural Evidence of Music as Emotional Coping Mechanism: Cross-cultural research consistently confirms music's universal role in emotional regulation and stress coping. Wright et al. (2025) report that students across diverse cultural contexts rely on music as a primary coping strategy during academic stress. Similarly, Dong Li (2022) demonstrates that music engagement enhances emotional well-being, self-confidence, and psychological resilience. These findings suggest that music functions as a culturally universal regulatory system, reinforcing its applicability in global teacher education frameworks.

8. Experimental Evidence Supporting Music Interventions in Education: Experimental and quasi-experimental studies provide strong empirical validation for music-based interventions in academic settings. Gallego-Gómez et al. (2019) found that music combined with relaxation techniques significantly reduces stress levels and enhances performance outcomes. Siswanto et al. (2025) reported that classical music exposure reduces academic anxiety, while Dhiyaneshwari et al. (2025) demonstrated that Indian classical music improves attention and emotional stability among teacher education students. A meta-analytic synthesis by De Witte et al. (2022) confirms the robustness of music therapy across diverse populations, although variability in intervention design remains a methodological concern.

9. Complementary Psychological Interventions: Music-based interventions align with broader psychological approaches such as mindfulness and cognitive stress management strategies. McConville et al. (2017) found significant reductions in stress through mindfulness-based interventions, while Chiesa and Serretti (2009) and Regehr et al. (2013) confirm the effectiveness of structured stress reduction programs in academic populations. These findings collectively suggest that music can be integrated within multimodal stress intervention frameworks rather than functioning as a standalone strategy.

10. Research Gap: Despite extensive evidence supporting the psychological and educational benefits of music, several critical gaps remain in the literature. First, most studies treat students and teachers as separate populations, with limited integration within teacher education systems. Second, there is a lack of structured pedagogical frameworks that operationalize music-based stress reduction in real classroom environments. Third, existing research is heavily dominated by passive listening interventions, while active pedagogical engagement with music remains underexplored. Finally, there is a significant shortage of context-specific research within Indian teacher education institutions. Furthermore, current literature does not sufficiently integrate the psychological mechanisms of stress reduction with pedagogical applications in teacher education. In particular, the relationship between music-based interventions and teacher identity formation remains underdeveloped. Additionally, there is a lack of comprehensive classroom-based implementation models that systematically incorporate music as a pedagogical strategy for stress management. This fragmentation reflects the absence of a holistic and interdisciplinary framework in existing research.

Final Conceptual Synthesis: The reviewed literature collectively establishes music as a multi-dimensional construct that operates at psychological, cognitive, and pedagogical levels. It functions simultaneously as an emotional regulator, a cognitive enhancer, and an effective instructional strategy. However, despite strong empirical validation, its systematic integration into teacher education remains underdeveloped. This limitation provides a clear justification for the development of structured pedagogical models that embed music-based interventions into teacher training programs. Such integration has the potential to reduce classroom stress, enhance teacher resilience, and improve instructional effectiveness through a theoretically grounded and empirically supported framework.

The validity of the current research: Keeping these research gaps in mind, the present study aims to analyze stress reduction and improvement in mental balance through music-based learning strategies in teacher education college students. The study is based on students of College of Education, Jammu, and aims to understand how music-based learning activities can develop positive attitudes, self-confidence, and emotional stability in teacher education students.

Objective of the Study: This study aims to examine the extent to which classroom-based music interventions can help reduce students stress. Initially, the current stress levels of students will be assessed to establish a baseline before any intervention. Subsequently, a variety of music-related activities, including instrumental and vocal sessions, will be implemented during class. After the intervention, the students' stress levels will be measured again to determine the impact. The effectiveness of these music-based activities will be analyzed using statistical tools such as mean, median, standard deviation, and ANOVA. Based on the results, the study will provide practical recommendations for enhancing students' learning experiences and emotional well-being through music in teacher education institution.

Hypothesis.

Null Hypothesis: (H0) Implementing music-based activities in the classroom will not produce a statistically significant reduction in students' stress level.

Alternative: (H1) Implementing music-based activities in the classroom will significantly lower students' stress level.

Research Methodology: This research adopted an experimental design using a pre-test and post-test approach. The study involved 20 students, randomly selected by the Education Department of the College of Teacher Education, Jammu, using simple random sampling. The research was conducted in three stages for 15 days (1) Pre-test, (2) Music Intervention Phase, and (3) Post-test. Initially In the pre-test, students stress level was assessed, during the intervention phase light instrumental music, vocal sessions, and group singing activities were incorporated into classroom teaching. After this students' stress level was reassessed through the post-test to find out the changes.

Population and Samples: The targeted population chosen were the students of Bachelor of Education of semester 1st of College of teacher Education. A total of 20 students were selected through random sampling. In the selection, both male and female students was chosen.

Tools and Techniques: A five-point rating scale was developed to collect data related to the stress of students. Indicators such as anxiety, attention, concentration, motivation, confidence and comfort level of the class were included. The points of the rating scale were as follows. No stress at all, very little stress, little stress, moderate stress, high stress. In addition, observations and informal discussions were held with the students to ensure the accuracy of the data obtained.

Table1. Five-Point Likert Scale

1	No stress at all
2	Very little stress
3	Little stress
4	Moderate stress
5	High stress

Statistical Tools: The data obtained from the students were analyzed with the help of basic statistical methods to understand the impact of music-based classroom activities on their stress level. Statistical measures such as mean, median, and mode were used to identify the general pattern of stress scores in both the pre-test and post-test. These measures helped in understanding the overall tendency of the students' responses before and after the intervention. Further, standard deviation and standard error were calculated to observe how much variation existed in the students' responses and to check the consistency of the results. To examine whether the change in stress levels after the music activities was meaningful, one-way Analysis of Variance (ANOVA) was applied. This statistical test helped determine whether the difference between the pre-test and post-test results was statistically significant. Overall, these statistical tools made it possible to clearly understand the effect of music-based classroom activities on reducing students stress level.

Data Collection:

A total of 20 students from the College of Teacher Education were selected for the study. The data were collected in three phases:

1. Pre-Test: Students' initial stress level was measured using a five-point rating scale, where each student received a score from 1 (No Stress at all) to 5 (High Stress).
2. Music Intervention Phase: Daily for 1 hour, music sessions were conducted for 15 days. Activities included light instrumental music i.e sitar, vocal exercises like "Raga Shree" and group singing like Dogri folk songs were incorporated into classroom teaching.
3. Post-Test: The same students were reassessed using the five-point rating scale to measure the reduction in stress level after the music intervention.

Data Tabulation:

The pre-test and post-test scores of all 20 students were tabulated for analysis. This comparison highlighted the changes in stress level resulting from the music-based classroom activities.

Table 2: Pre-Test and Post-Test Scores of 20 Students

Students	Pre-Test	Post-Test
1	4	2
2	5	3
3	4	2
4	3	2
5	5	3
6	4	2
7	3	2
8	4	3
9	5	3
10	3	2
11	4	2
12	4	2
13	5	3
14	3	2
15	4	2
16	3	2
17	4	3
18	5	3
19	4	2
20	3	2

Data Analysis:

Table 3: Comparison of Students’ Stress Level Before and After Music Based Intervention.

Measure	Pre-Test Stress	Post-Test Stress
Mean	3.95	2.35
Median	4	2
Mode	4	2
Standard Deviation	0.76	0.48
Standard Error	0.17	0.11

The descriptive analysis revealed a reduction in the mean, median, and mode of students’ stress levels following the music-based intervention. The decline in standard deviation and standard error suggests a more uniform reduction in stress among the participants.

Table 4: ANOVA Analysis of Pre-test and Post-test Stress Scores

Source of Variation	SS	Df	MS	F-Value	Significance(P)
Between Groups	13.06	1	13.06	54.56	P< 0.01
Within Groups	4.54	38	0.12	-	-
Total	17.60	39	-	-	-

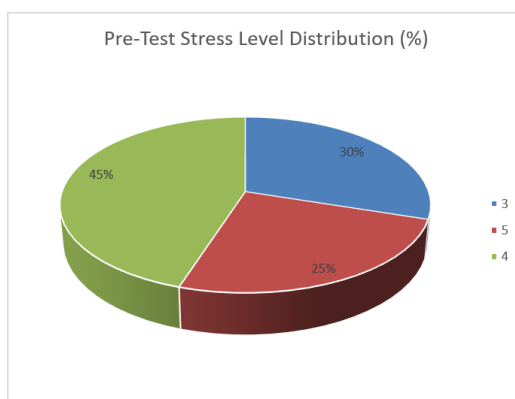


Figure 1: Percentage Distribution of Students’ Stress Levels Before the Intervention

The ANOVA results, with an F-value of 54.56 at $p < 0.01$, demonstrate a statistically meaningful difference between pre-test and post-test stress scores. This result indicates that the music-based intervention effectively reduced students' stress levels in the classroom.

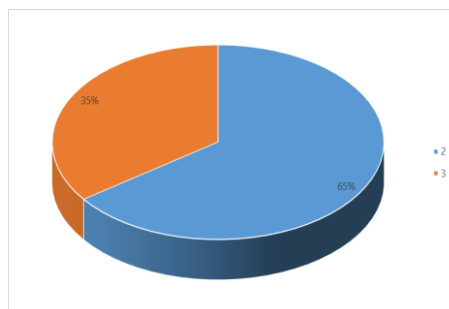


Figure 2: Post-Test Stress Level Distribution (%)

The study analysed pre-test and post-test stress scores of 20 students. So as to find out to what extent music-based intervention can reduce stress in the classroom. The collected data was analysed through mean, median, and mode. This provided clear quantitative evidence of the impact of the intervention.

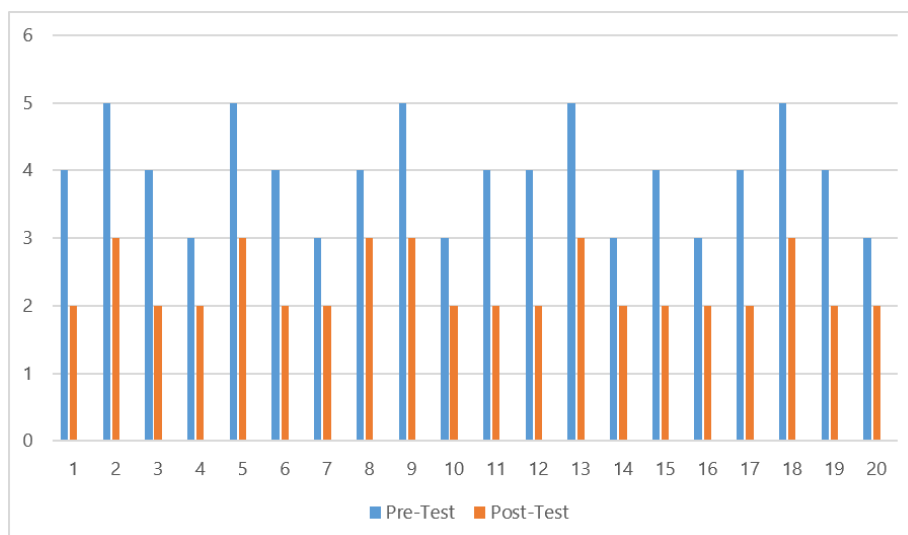


Figure 3: Comparison of Pre-Test and Post-Test Stress Levels Among Students

Observation

The pre-test analysis showed that the mean stress score among students was 3.95, indicating relatively high stress levels in the classroom. After the music-based intervention, the post-test mean dropped to 2.35, reflecting a significant decrease in stress. Median and mode values also decreased from 4 in the pre-test to 2 in the post-test, suggesting that most students experienced a reduction in stress. Additionally, the standard deviation decreased from 0.76 in the pre-test to 0.48 in the post-test, and the standard error declined from 0.17 to 0.11. These changes indicate that the reduction in stress was consistent among students and that the results were more uniform after the intervention. One-way ANOVA confirmed the statistical significance of this decrease in stress, with $F = 54.56$ at $p < 0.01$. These findings support rejecting the null hypothesis (H_0) and accepting the alternative hypothesis (H_1), showing that music-based sessions had a measurable and meaningful effect on reducing classroom stress.

Discussion

The analysis demonstrates that music-based learning activities significantly reduced students' stress levels. The comparison between pre-test and post-test scores revealed that the mean stress decreased from 3.95 to 2.35, and median and mode values also declined, highlighting the positive impact of musical interventions on students' mental state. The classroom music sessions included instrumental music, vocal exercises, group singing, and rhythmic vocal activities. These activities helped students feel calmer, improved their self-control, and enhanced confidence. In addition, the sessions increased students' interest in learning and their ability to focus during class. This study also shows that integrating music into classroom

instruction contributes to a positive learning environment, strengthening the relationship between teachers and students. Such an environment supports not only academic performance but also emotional stability. The results align with prior research (De Witte, 2022; Rastogi, 2021; Salihu, 2024), which highlights that regular engagement with music is effective in maintaining mental balance and reducing stress. A notable aspect of this study is its focus on active participation rather than passive listening. Students engaged in group singing, rhythmic exercises, and playing musical instruments, which not only improved their mental well-being but also fostered interpersonal cooperation, self-expression, and confidence. Overall, the music-based learning environment strengthened the teacher-student bond and made classroom learning more engaging and comfortable. The findings indicate that music-based pedagogies in teacher education institutions can promote mental health, improve the quality of teaching, and cultivate sensitivity and emotional balance in students.

Conclusion: The study clearly demonstrates that music has a strong and positive influence on students' emotional and psychological well-being. Incorporating music into the classroom creates a pleasant environment—it actively contributes to lowering stress and promoting mental balance among students. The analysis of pre-test and post-test data reveals that music-based activities enhance students' self-assurance, emotional resilience, and overall sense of calm. By engaging with music, students are able to manage classroom stress more effectively, which supports better focus, participation, and motivation in academic activities. Furthermore, the use of music as an educational tool encourages creativity and innovation in teaching methods. It fosters a supportive classroom atmosphere where students feel comfortable and confident, while also strengthening the interpersonal relationship between teachers and students. This study reveals that music-based pedagogical approaches can be a valuable addition to modern teacher education. They not only help students to cope up with psychological pressures but also promote holistic development, including cognitive, emotional, and social skills. Therefore, integrating structured music activities into teaching can serve as an effective strategy for enhancing learning, well-being, and overall student engagement in educational institutions.

Recommendations and Suggestions

1. Teachers should creatively adopt music-based activities and teaching strategies in the classroom.
2. Music-based sessions should be held regularly in schools and teacher training institutions.
3. Special attention should be paid to the effective use of music in teacher training programs.
4. Music is taught as a whole at the Bachelor of education and Masters levels. Similarly, Indian classical music and folk music should also be taught in teacher education colleges.
5. In teacher education colleges, music is taught as an elective subject for up to two semesters out of our semesters. While not keeping it optional, both instrumental and vocal music should be taught with adequate time and attention.
6. Future research should study the long-term effects of music across different age groups and disciplines.
7. The education policymakers should take steps to include music in the curriculum.

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