

The Impact of Mindfulness Practice on the Practice Efficiency of Tertiary-Level Violin Students in Zhengzhou, China

Xingchen Guo^{1*} , Yi-Li Chang²

¹Universiti Malaya, 50603 Kuala Lumpur, MALAYSIA.

²Universiti Malaya, 50603 Kuala Lumpur, MALAYSIA.

*Corresponding Author: tgzhuanyong2025@163.com

Citation: Guo, X., & Chang, Y.-L. The Impact of Mindfulness Practice on the Practice Efficiency of Tertiary-Level Violin Students in Zhengzhou, China. *Journal of Cultural Analysis and Social Change*, 10(2), 4885–4896. Retrieved from <https://jcas.com/index.php/jcas/article/view/2359>

Published: November 25, 2025

ABSTRACT

This study explores the role of mindfulness practice in improving the practice efficiency of tertiary-level violin students in Zhengzhou, China. Violin learning requires precise coordination, emotional regulation, and sustained concentration, often accompanied by physical strain and psychological stress. Drawing upon Mindfulness Theory, Self-Regulated Learning (SRL), and Self-Determination Theory (SDT), this research examines how mindfulness can enhance students' technical skills such as bow control, intonation stability, and posture alignment while reducing anxiety and tension. Through literature review and theoretical synthesis, the study identifies mindfulness as a multidimensional method that strengthens attention, emotional stability, and bodily awareness. Compared with other psychological interventions, mindfulness demonstrates a distinctive ability to integrate cognitive, emotional, and physiological regulation. The findings suggest that mindfulness strengthens students' self-regulation and motivation and supports their overall well-being. It provides an innovative pedagogical framework for violin education. This study contributes to bridging the gap between traditional technique-centered training and holistic, mind-body-integrated approaches, offering practical implications for music educators who seek to improve learning outcomes and promote sustainable artistic development.

Keywords: Mindfulness practice, Violin education, Practice efficiency, Self-regulated learning (SRL), Music performance anxiety.

INTRODUCTION

The issue of practice efficiency has long challenged music students worldwide (Miksza & Tan, 2015). Contemporary college-level music students often face academic pressure, self-doubt, low confidence, and difficulties in identifying effective practice strategies. Previous research highlights that self-efficacy and metacognitive strategies play critical roles in successful learning (Nielsen, 2004), while self-discipline and intrinsic motivation are essential for productive practice (Byo, 2008; Miksza, 2006). Students who can stay focused, motivated, and reflective in their learning process are more likely to achieve higher practice efficiency and performance quality (Mieder & Bugos, 2017). In today's rapidly evolving musical environment, music students and educators must continually adapt to new technologies, techniques, and genres (Asare, Twum & Amoah, 2023). Therefore, fostering students' self-regulation and positive mindset is crucial for improving their learning and practice outcomes.

Among musical instruments, the violin is considered one of the most demanding due to its complex techniques and the need for precise physical coordination and mental concentration. As a fretless instrument, the violin requires performers to rely entirely on auditory and tactile feedback for accurate intonation, which

significantly increases the technical challenge (Aykut & Taş, 2023). Psychological states play an equally vital role: anxiety and self-doubt can lead to loss of bow control, muscle stiffness, and unstable intonation (Kerner, 1969). Conversely, a calm and focused mental state enhances motor control and musical expressiveness. Mindfulness, a psychological practice that cultivates non-judgmental awareness of the present moment, has been shown to reduce performance anxiety and improve attention in musical contexts (Blyskal, 2022). However, limited research has examined how mindfulness specifically influences violin technique and performance quality.

Mindfulness is defined as the conscious awareness of present experiences with an attitude of openness and non-judgment (Bateman, 2012). It involves focusing on the current moment through practices such as mindful breathing and body scanning, enhancing emotional regulation and attention control (Bostock et al., 2019). Empirical studies show that mindfulness can reduce anxiety, enhance learning efficiency (Hyland, 2014), improve workplace productivity (Good et al., 2016), and increase focus and creativity in artistic performance (Tremayne & Morgan, 2016). For violinists, mindfulness can mitigate muscle tension caused by prolonged fixed posture, increase body awareness, and help prevent performance-related injuries (Hölzel et al., 2011; Czajkowski, 2018). Furthermore, mindfulness-based awareness training allows performers to remain focused on present actions rather than on past mistakes or future worries, thus improving technical precision and psychological stability (Chang & Seiden, 2019; Blyskal, 2022).

In China, violin education has developed through a fusion of Russian and European pedagogical approaches, gradually forming a distinctive system that balances global standards with Chinese characteristics (Fang, 2024). Despite strong societal interest and growing enrollment, inequalities in educational resources and exam-oriented teaching remain significant challenges (Li, 2020). In regions such as Zhengzhou, limited institutional support and heavy performance pressures often lead to inefficient practice routines and heightened anxiety (Fang, 2024; Li, 2020). Scholars suggest leveraging digital tools and modern teaching methods to improve training efficiency (Shen, 2009). Within this context, integrating mindfulness into violin instruction may offer an effective means to address these systemic issues by promoting holistic, mind-body-oriented learning approaches.

This study therefore focuses on tertiary-level violin students in Zhengzhou, China, to investigate how mindfulness practice affects practice efficiency and technical performance. Through quantitative analysis, the research aims to determine whether mindfulness interventions can enhance students' bowing control, intonation stability, and posture alignment, while simultaneously reducing anxiety and physical strain. Furthermore, it explores the mediating mechanisms through which mindfulness contributes to technical mastery and overall well-being.

By bridging mindfulness with region-specific violin pedagogy, this study addresses a critical research gap. Although mindfulness-based interventions (MBIs) have demonstrated success in managing performance anxiety and improving emotional regulation (Czajkowski et al., 2020), few studies have examined their impact on violin-specific technical challenges, such as bow control or real-time pitch correction. Traditional violin instruction in Zhengzhou emphasizes mechanical repetition rather than mental awareness or emotional balance. Consequently, without targeted mindfulness interventions, students are prone to technical stagnation, chronic anxiety, and even injury due to physical overuse (Rensing et al., 2018; Hildebrandt et al., 2012). This research, therefore, proposes a novel approach that integrates mindfulness into violin training to enhance practice efficiency and promote sustainable artistic development.

The theoretical foundation of this study draws from Mindfulness Theory, Self-Regulated Learning (SRL), and Self-Determination Theory (SDT). Mindfulness fosters attention, emotional balance, and self-awareness, while SRL emphasizes goal setting, strategic learning, and self-monitoring. SDT, on the other hand, focuses on intrinsic motivation and autonomy. Integrating these three frameworks allows a comprehensive understanding of how mindfulness influences learning outcomes. Specifically, mindfulness strengthens SRL by enhancing focus and self-control, and aligns with SDT by promoting autonomy, competence, and intrinsic motivation. Together, they form a coherent conceptual framework that explains how mindfulness can improve both the psychological state and technical efficiency of violin students (Figure 1).

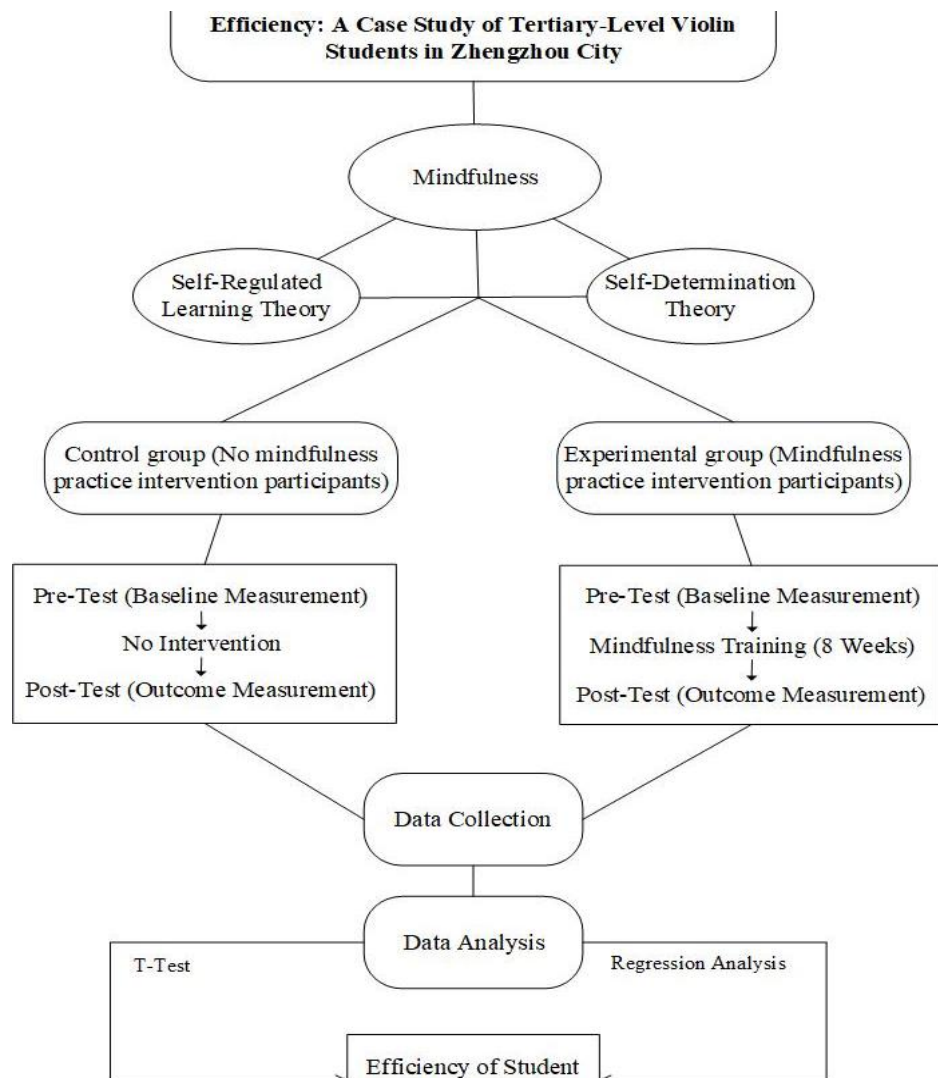


Figure 1. Conceptual Framework of the Impact of Mindfulness Practice on Practice Efficiency for Tertiary-Level Violin Students in Zhengzhou City.

In summary, violin performance requires the synergy of precise technical skills, physical control, and mental calmness. Mindfulness practice provides a powerful tool to enhance focus, alleviate stress, and promote emotional resilience, key factors for effective practice and confident performance. By examining mindfulness within the specific context of violin training in China, this study seeks to offer empirical evidence and practical insights to enrich music pedagogy. Ultimately, it aims to bridge the gap between traditional technique-centered instruction and holistic, mindful learning approaches, contributing to a more balanced and sustainable model for violin education.

ENHANCING PRACTICE EFFICIENCY IN MUSIC LEARNING

In exploring how to improve practice efficiency in music learning, the central role of metacognition and self-regulated learning strategies becomes particularly important. Current research indicates that while music students generally possess a knowledge system of basic practice techniques, they often face numerous challenges in actual application. This further underscores the necessity of deeply applying these advanced learning strategies. The research by Mieder and Bugos (2017) is particularly noteworthy, highlighting that implementing self-regulated learning practice strategy courses can not only enhance students' self-efficacy but also significantly improve and optimize their practice behavior patterns. Hart's (2014) insightful perspectives further emphasize the crucial role of metacognitive strategies in developing efficient practice skills and advocate for educators to play a key role as guides and facilitators in this process.

From a practical perspective, the application of metacognitive strategies enables students to systematically plan their practice sessions, monitor their progress in real-time, and effectively evaluate their performance. This ensures that each practice session precisely focuses on goals and achieves the intended outcomes. Simultaneously, self-regulated learning strategies motivate students to take responsibility for their own learning, plan and use their time efficiently, choose practice methods that suit their individual needs, and actively make self-adjustments based on feedback. This creates a positive cycle of continuous improvement.

Miksza (2007) provided solid empirical support for this theoretical framework, revealing the close relationship between effective practice behaviors, such as targeted repetition, whole-part-whole strategies, slow practice, and musical performance achievement. Additionally, he pointed out that students' self-reported positive practice habits, such as regularly using a metronome and ensuring sufficient formal practice time, have a significant positive impact on improving performance quality.

Therefore, music educators should highly value the importance of metacognitive and self-regulated learning strategies. By employing innovative teaching methods, providing personalized support, and fostering students' self-management abilities, educators can help students better master these advanced learning strategies. This, in turn, will enable students to achieve more efficient and autonomous growth on their musical learning journey.

Metacognitive in Music Learning

Metacognition has a profound and wide-ranging impact on music learning and performance. It serves as a solid bridge connecting various stages of musical education, from beginners to expert musicians. The exceptional level of achievement reached by expert musicians is largely due to their highly developed metacognitive abilities. These abilities enable them to precisely self-regulate their learning and practice processes, ensuring that every effort is efficient and targeted (Concina, 2019). In contrast, the general lack of understanding and application of metacognitive strategies among music students is a significant obstacle to their rapid progress. Therefore, there is an urgent need in the field of music education to strengthen the guidance of students in metacognitive strategies, helping them unlock this crucial capability and accelerate their growth (Concina, 2019; Benton, 2013).

The metacognitive process, encompassing task understanding, planning, execution, and evaluation, is not only central to the daily practice of expert musicians but also serves as a crucial step for beginners aspiring to reach musical excellence (Araújo et al., 2024). This process requires students to continuously self-examine, clearly define learning goals, devise reasonable plans, flexibly adjust strategies in practice, and ultimately assess their learning outcomes through self-evaluation. This process not only enhances students' musical skills but also cultivates their self-reflection and self-management abilities.

To effectively promote the development of metacognition in music students, music educators should adopt a variety of innovative teaching methods. Activities such as reflective writing, self-assessment tools, and think-aloud sessions are effective means to stimulate students' metacognitive awareness and enhance their self-learning abilities (Benton, 2013). These activities encourage students to shift from passive reception to active exploration, fostering their independent learning and critical thinking skills, thereby laying a solid foundation for future music learning and careers.

However, it is worth noting that although metacognitive strategies may have been integrated into music curricula, students often fail to fully recognize their importance. This reflects a need for greater emphasis and explicit guidance on metacognitive strategies in music education practice (Colombo & Antonietti, 2016). Therefore, teachers need to more actively guide students to recognize the value of metacognition, help them master relevant skills through specific examples and practical activities, and integrate these skills into their daily learning habits.

The enhancement of metacognitive skills is not limited to the field of music; its universal characteristics enable it to have a positive impact across disciplines. By cultivating students' metacognitive abilities, we can help them better adapt to the learning demands of different subjects, improve their overall competence, and achieve holistic development (Benton, 2013; Concina, 2019). Therefore, music educators should view metacognitive strategies as important tools for fostering students' overall qualities, providing strong support for their future learning and growth.

Self-Regulated Learning (SRL) Strategies in Music Learning

In the in-depth exploration of the field of music education, self-regulated learning (SRL) strategies undoubtedly demonstrate their importance as a key mechanism for enhancing learning outcomes. McPherson & Zimmerman's (2011) research reveals how SRL plays a central role in music learning environments by enhancing students' abilities to plan, monitor, and evaluate, leading them towards efficient and self-driven learning. This learning model not only promotes the professional development of musical skills but also reflects the learners' high level of autonomy and strategic approach in handling complex cognitive tasks.

Advanced music students exemplify the practice of SRL strategies. They demonstrate the multi-dimensional application of SRL in music learning by accurately identifying problem areas, strategically merging practice

segments, and constructing detailed auditory representations. These examples not only reflect the efficient execution of student behaviors but also reveal the deep integration of cognitive and affective dimensions, providing valuable insights into the practical application of SRL in music education. Although existing research points to a positive correlation between SRL processes and music learning outcomes, this relationship may be subtle in some contexts. However, when we focus on the implementation effects of SRL teaching strategies, their significant impact on students' skill acquisition becomes evident, further emphasizing the potential value and application prospects of SRL in music education.

To deepen the research on SRL in the field of music learning, future academic exploration should focus on the following areas: first, expanding the scope of research to include a broader range of music learners to reveal the differences and commonalities in the application of SRL strategies across various backgrounds and levels; second, strengthening the combination of qualitative research and quantitative analysis to deeply analyze learners' understanding of SRL theory and their practical experiences, thereby constructing a more comprehensive and in-depth understanding framework; and finally, exploring the integration of SRL strategies with modern technological means to develop innovative teaching tools that meet learners' individualized needs and enhance the overall quality of music education.

CONCENTRATION, PATIENCE AND MENTAL CONDITIONING FOR VIOLIN LEARNING

In recent years, the exploration of mental training techniques in the field of violin learning has deepened, particularly in their application among young students, showcasing their multifaceted positive impacts. The research by Vilnita and Marnauza (2024, 2023) is particularly notable, as it empirically demonstrates how mental training strategies can significantly optimize key elements of violin performance, such as intonation accuracy, rhythmic stability, and a profound understanding of technical details and musical expression processes. This enhancement is evident not only in technical advancement but also in the core of musical understanding and expression, promoting the overall development of students' musical literacy.

Imagery training is a key component of mental training, encouraging students to construct clear mental images to simulate performance scenarios. This method greatly enhances students' foresight and control over their performance actions, resulting in more refined bow control and richer tone production. Additionally, combining mental practice (such as visualizing the performance process) with physical practice achieves a "mind-body unity" training effect, promoting the internalization of skills and enhancing students' self-monitoring and self-adjustment abilities. To cultivate students' creativity and imagination, creative musicality exercises are introduced into violin teaching. This practice encourages students to think outside the traditional framework, exploring the diversity and depth of musical expression. It not only stimulates students' interest in learning but also promotes a profound understanding of musical emotions and atmospheres, making their performances more vivid and emotionally engaging. Scott (1992) conducted a comparative study that demonstrated the significant advantages in attention and perseverance among children participating in Suzuki violin lessons. This finding highlights the importance of early music education in shaping students' positive psychological traits. The Suzuki teaching method, which emphasizes "listening before seeing, feeling before thinking," provides strong support for the development of students' psychological qualities. Pavel's (2023) research underscores the critical role of teachers in the mental training process. Teachers are not only transmitters of technical knowledge but also guides for students' psychological growth. Through scientific teaching methods, timely encouragement and feedback, and keen insight into individual differences among students, teachers provide personalized support and guidance. This teaching approach helps students overcome psychological barriers, build self-confidence, and achieve synchronous development of skills and psychology.

With continuous research and technological innovation, the application prospects of mental training techniques in violin teaching are vast. In the future, we look forward to seeing more efficient and scientific mental training methods introduced into the teaching field to meet the diverse needs of students. These new methods will place greater emphasis on individual differences and psychological needs, providing stronger support for the growth of young violinists.

CHALLENGES IN MAJOR VIOLIN AND EDUCATION

Violin tertiary level indeed face multi-dimensional and complex challenges in their education and practice. These challenges involve not only the enhancement of professional skills but also psychological adjustment, time management, learning methods, and adapting to changes in the external environment.

The integration of high-level violin playing techniques with profound music theory knowledge is a hurdle that every student must overcome. Mio's (2019) research points out that many students may have deficiencies in skills and knowledge when they enter the program, requiring them to continuously improve their professional skills while supplementing their learning through remedial teaching methods. These methods focus not only on technical training but also on the study of teaching theories, helping students understand how to effectively teach and receive musical knowledge. Time management and overcommitment are other significant issues. Edgar's (2019) research reveals the difficulties violin students face in balancing study, practice, rest, and social activities. While long hours of practice are crucial for skill improvement, they can also lead to physical and mental exhaustion, affecting learning efficiency and quality of life. Therefore, students need to learn how to manage their time effectively, avoid overcommitment, and maintain their physical and mental health. The development of self-regulated learning behaviors is another important challenge for violin students. Kim's (2010) research shows that transitioning from relying on teacher guidance to becoming proficient self-regulated learners is a long and complex process. Students need to gradually develop the abilities of self-monitoring, self-motivation, and self-assessment to continue progressing even without direct supervision from teachers. Music plays a dual role in the lives of violin students. On one hand, it provides a means for self-expression and emotional release, enriching their life experiences; on the other hand, high expectations, competitive pressure, and the uncertainties of a musical career can also increase their psychological burden. Edgar's (2019) research emphasizes the complex emotional impact of music on students, reminding us to pay attention to their mental health. The constantly changing cultural and economic environment presents new challenges for violin teaching in higher education. Li's (2020) research points out that with the deepening of globalization and rapid technological advancements, traditional teaching methods may no longer meet students' needs. Therefore, teachers need to continuously adjust their teaching strategies, incorporate new teaching concepts and technological means to adapt to the changing times and students' needs.

The challenges faced by violin tertiary level in their education and practice are multi-faceted and require the joint efforts of educators, students, and society to address them. Through ongoing research and teaching innovation, we can provide more comprehensive and effective support for violin students, helping them overcome difficulties and achieve their musical dreams.

MINDFULNESS PRACTICE IN MUSIC EDUCATION

Integrating mindfulness practice with music education is an innovative cross-disciplinary approach that is gradually demonstrating its unique educational value and profound impact. As revealed by the research of Blyskal (2018) and Steinfeld & Brewer (2015), mindfulness practice excels in reducing performance anxiety among musicians. By cultivating a non-judgmental awareness of present experiences, musicians can focus more on the process of playing, reducing worries about external evaluations, thereby enhancing their confidence and expressiveness. This optimization of psychological states not only helps musicians present their artistic talents more calmly on stage but also lays a solid psychological foundation for their professional careers.

In the field of music education, the application of mindfulness practice has also achieved significant success. Research by Czajkowski et al. (2020) found that mindfulness courses not only enhanced music students' levels of awareness but also significantly reduced their self-criticism, leading to noticeable improvements in their instrumental performance skills. Particularly in vocal courses, mindfulness practice helped students better manage anxiety during the learning process, improving their learning experience. This allowed them to focus more on their voice and bodily sensations, quickly mastering singing techniques and enhancing their vocal performance (Blyskal, 2018). Hernandez-Ruiz & Dvorak's (2020) research also pointed out that different types of auditory stimuli can produce varying effects in mindfulness experiences. Slightly complex musical elements are more likely to engage individuals' attention and emotional resonance, promoting a deeper state of mindfulness. This finding provides valuable insights for designing music education courses that integrate mindfulness. It suggests that such courses should consider the diversity and complexity of musical elements to meet the needs and preferences of different participants. For students in higher music education institutions, the impact of mindfulness practice is even more profound. Farnsworth-Grodd (2012) found that over time, students inclined towards mindfulness exhibited lower anxiety levels in musical performances. This indicates that mindfulness is not only a strategy for emotional regulation but also an intrinsic psychological resource that helps students maintain a stable mental state to cope with performance pressures. Additionally, situational mindfulness during performances enables students to focus more on positive aspects, enhancing their self-acceptance and overall performance quality.

Mindfulness practice benefits musicians of different ages and skill levels. McPherson & Renwick (2001) discovered that although children exhibit differences in their self-regulation processes during music practice, mindfulness training can still play a positive role by helping them overcome frustration and maintain a positive learning attitude. Notably, Mohammadi et al. (2020) revealed the unique value of mindfulness training for pre-

adolescent students, who often face challenges in emotional regulation and cognitive control. Mindfulness training effectively reduces their negative emotions and improves adaptive emotional regulation abilities.

The integration of mindfulness practice with music education not only provides strong support for enhancing students' musical literacy and performance abilities but also lays a solid foundation for their mental health and overall development. We encourage music teachers and educational institutions to actively adopt this integrated approach, incorporating it into their daily teaching routines. This will offer students a more comprehensive and scientific training program, fostering their healthy growth and exceptional development in their musical journeys.

Mindfulness Practice in Violin Pedagogy

Recent studies have deeply explored the multifaceted effects of mindfulness training on music students, particularly violinists. Research by Czajkowski et al. (2020, Czajkowski, 2018) shows that mindfulness courses designed specifically for musicians significantly enhance students' levels of awareness, concentration, and bodily awareness. This improvement not only helps them better understand the essence of musical works but also directly improves their instrumental skills. Through mindfulness practice, students can focus more intently on each note and movement during performance, thus increasing practice efficiency and making each session more effective. Additionally, this enhanced focus promotes smoothness and expressiveness in their performance, making their playing more vivid and moving. Vilnė and Marnauza's (2024) study highlights the positive impact of mental training that combines imagery and physical practice for young violinists. This comprehensive training method not only improves bow control and tone production but also deepens their understanding and interpretation of musical pieces. Through imagery exercises, students can mentally simulate performance scenarios, enhancing spatial perception and movement coordination. Physical practice then helps them translate these mental images into actual playing skills, further improving their performance level. Czajkowski's (2018) research also reveals the significant effects of mindfulness and mental training techniques in reducing performance anxiety and increasing the enjoyment of playing. Performance anxiety is a common issue many musicians face in their careers, which can severely affect performance quality. However, through mindfulness practice, students learn to face the challenges and uncertainties of performance with a more peaceful and accepting mindset, thereby alleviating anxiety. Moreover, mindfulness practice enhances students' love for and enjoyment of music, allowing them to immerse themselves fully in their playing and experience the pure joy that music brings.

However, the physical symptoms experienced by violinists are also significant issues that cannot be ignored. McCrary et al. (2016) point out that physical problems, such as symptoms in the right shoulder and wrist, directly affect muscle activity patterns during performance, leading to altered muscle use and a decline in playing quality. These physical symptoms not only impact students' performance but can also have long-term adverse effects on their physical and mental health. Therefore, mindfulness and mental training techniques are invaluable tools for addressing physical tension and improving muscle control in violin students. Mindfulness and mental training techniques play a crucial role in enhancing violin students' playing skills, reducing performance anxiety, and increasing the enjoyment of playing. They are also effective means for addressing physical symptoms and improving muscle control. Hence, we encourage music teachers and educational institutions to incorporate mindfulness and mental training into music education, providing students with a more comprehensive and scientific training program. This will support students in achieving greater stability and success on their musical journeys.

Although mindfulness practice has been increasingly applied in music education, its specific effects vary across different instrument learning processes. Mindfulness has been proven to have significant effects in fields such as piano, vocal, and percussion, especially in reducing performance anxiety and enhancing attention. For instance, Blyskal (2018; 2022) investigated the role of mindfulness practice in vocal performance and found that mindfulness significantly improved students' focus and reduced performance anxiety. Vocal students, through mindfulness practice, were better able to control their breathing and express emotions more freely while singing. Mindfulness helps them focus more on the current singing state rather than worrying about future performance outcomes, which is similar to violin students needing to maintain focus on technical details like bowing and intonation during performance. However, compared to vocal learning, violin study relies more on precise finger and bow control, so mindfulness may play a unique role in enhancing finger sensitivity and muscle coordination for violin students.

The study by Czajkowski et al. (2020) also showed that mindfulness practice significantly improved piano students' playing fluency and attention control. Like the violin, piano performance requires precise finger movement and coordination, but since pianists' hand movements directly interact with the keys, they are less prone to the muscle tension issues caused by "arm suspension," which is more common for violinists. Therefore, in violin practice, mindfulness may have a more pronounced effect, particularly in alleviating muscle tension in the arms and shoulders.

For percussion learning, mindfulness practice helps percussion students maintain steady rhythm control and focus during performance. However, percussion instruments have vastly different technical requirements compared to the violin. Percussion playing often involves larger movements, while the violin requires more refined motion control. Hence, mindfulness might have a more positive influence on violin students' fine motor control abilities.

Although the effects of mindfulness practice across different instruments show positive outcomes in anxiety reduction and attention enhancement, the violin, as an instrument requiring highly precise control and full-body coordination, benefits particularly from mindfulness practice in terms of reducing muscle tension and improving movement flexibility. Compared to other instruments, violin students can more effectively enhance their physical control during performance through mindfulness, thereby improving overall practice efficiency.

Comparison of Mindfulness with Other Psychological Interventions: Anxiety Management and Attention Enhancement

When discussing the impact of mindfulness interventions on the practice efficiency of violin students, it is necessary to compare other psychological intervention methods, such as Cognitive Behavioral Therapy (CBT) and Progressive Muscle Relaxation (PMR). These methods have shown significant effects in managing anxiety, enhancing focus, and improving emotional regulation, but they have different focuses compared to mindfulness interventions.

Cognitive Behavioral Therapy (CBT) primarily reduces anxiety triggered by self-criticism and fear of failure by changing students' negative thinking patterns regarding practice and performance (Hofmann et al., 2012). In music learning, CBT has been proven effective in reducing performance anxiety and enhancing self-confidence. However, CBT focuses on cognitive restructuring, requiring students to learn to identify and challenge negative thoughts. This approach contrasts sharply with the non-judgmental observation and acceptance in mindfulness, where the latter allows students to accept their negative emotions and thoughts without trying to change them (Segal et al., 2004). Mindfulness practice not only alleviates anxiety and enhances attention but also optimizes students' practice experiences by improving their awareness of their body and emotions (Kabat-Zinn, 1990).

Progressive Muscle Relaxation (PMR), on the other hand, focuses on relieving physical tension by consciously tensing and relaxing specific muscle groups (Jacobson, 1938). In music education, PMR is commonly used to help musicians alleviate muscle tension from long practice sessions (Bernardi et al., 2006). This method is highly effective in managing physical stress, but unlike mindfulness, PMR concentrates solely on physical relaxation, whereas mindfulness integrates multi-level regulation of both the psychological and physiological aspects (Grossman et al., 2004). By enhancing the awareness of both body and emotions, mindfulness not only reduces physical tension but also improves emotional regulation, further enhancing students' practice efficiency (Brown & Ryan, 2003).

Although CBT and PMR each have their own advantages in managing anxiety and improving physical condition, the unique aspect of mindfulness interventions lies in its holistic regulation of the mind and body. Mindfulness not only effectively reduces anxiety but also improves students' attention, body awareness, and emotional regulation, making them more efficient and confident when facing long practice sessions (Zeidan et al., 2010).

MECHANISMS OF MINDFULNESS PRACTICE TO ENHANCE THE EFFICIENCY OF MUSIC STUDENTS' PRACTICE

Mindfulness practice emphasizes focusing attention on the current task, without being distracted by past memories or future worries. For music students, this means being able to concentrate more on the music itself during practice, such as intonation, rhythm, technique, and other details, thus reducing distractions caused by external disturbances or internal thoughts. Music learning often comes with pressure and challenges, and performance anxiety is a common issue many students face. Mindfulness practice helps students learn to observe and manage their emotions, alleviating anxiety and stress, allowing them to approach practice and performance with a calmer and more stable mindset. This enhancement in emotional regulation helps students maintain resilience when encountering setbacks, thereby improving practice efficiency. Music performance requires a high degree of bodily coordination. Mindfulness practice increases students' bodily awareness, enabling them to better perceive their physical state, including the posture and movements of fingers, wrists, and arms. This improved bodily awareness helps students adjust and optimize their playing posture and movements, reducing errors and fatigue caused by improper posture or uncoordinated movements, thereby enhancing practice efficiency.

Neurophysiological Mechanisms

In recent years, as scientific research has deepened, the mechanisms of mindfulness meditation practices at the neurophysiological level have gradually been revealed. These findings not only deepen our understanding of its internal mechanisms but also provide a solid scientific basis for the application of mindfulness meditation in education, mental health, and other fields. For violin students, these neurophysiological changes may be the physiological foundation that allows mindfulness practice to enhance their practice efficiency. The impact of mindfulness meditation on the medial cortex and the default mode network is particularly important (Marchand, 2014). The medial cortex is closely related to attention, self-awareness, and other higher cognitive functions. Its optimization directly affects an individual's concentration and self-awareness levels. The default mode network is typically active during rest and is associated with self-reflection and internal experiences. Mindfulness meditation reduces the activity of the default mode network, allowing individuals to focus more on the current task, thus improving attention control. For violin students, this means fewer distractions during practice and greater focus on finger positioning, bowing, intonation, and other details, thereby enhancing practice effectiveness. The effects of mindfulness meditation on the insula and amygdala are also significant (Marchand, 2014). The insula, as the center for emotional and pain experiences, enhances the ability of individuals to clearly recognize their emotional states and make appropriate adjustments. The amygdala, a key structure in emotion processing, often overreacts, causing individuals to struggle with negative emotions. Mindfulness meditation reduces the amygdala's overreaction to negative stimuli, enabling individuals to face emotional challenges more calmly and maintain a stable psychological state. For violin students, this means they can adjust their mindset more quickly and stay calm and confident when facing performance pressure or practice setbacks.

Multiple studies have also assessed the impact of mindfulness training on attention control using tasks such as the Stroop task. These studies indicate that regular, brief mindfulness training can improve electrophysiological indicators of attention control, such as changes in event-related potentials. These changes reflect a substantial improvement in attention control abilities at the neurophysiological level due to mindfulness training. For violin students, this means they can maintain higher levels of focus and attention stability during long practice sessions, thereby improving practice efficiency and quality.

Ivanovski & Malhi's (2007) neuroimaging research further reveals the reshaping effects of mindfulness practice on brain structure and function. These changes not only provide a neurophysiological basis for the effectiveness of mindfulness meditation in emotional regulation but also strongly support its positive impacts on enhancing attention control and improving mental health. For violin students, this optimization of brain structure and function will provide a more solid psychological foundation, helping them better cope with the various challenges in practice and performance.

Psycho-Cognitive Mechanisms

The core of mindfulness practice lies in cultivating a non-judgmental, non-reactive observational attitude, which helps individuals perceive their current experiences—including bodily sensations, emotional states, and thought activities—more clearly and directly (Baer, 2009). By enhancing this ability (i.e., mindfulness awareness), individuals can gradually break free from habitual automatic response patterns, gaining a more comprehensive understanding of themselves and their surroundings (Baer, 2009). As levels of mindfulness increase, several psychological functions improve significantly. Specifically, individuals experience reduced incessant rumination over past events and excessive worry about future uncertainties (Baer, 2009). Additionally, they enhance their ability to manage emotions and behaviors, responding more calmly and rationally to challenges (Isbel & Mahar, 2015). Mindfulness practice also helps reduce over-identification with personal thoughts and feelings, allowing individuals to achieve a more objective and detached perspective (Isbel & Mahar, 2015). These improvements collectively contribute to better psychological health and overall mental functioning. In mindfulness practice, specific techniques such as open monitoring meditation play a crucial role. These techniques involve observing and noting present experiences, helping individuals identify and change harmful thought patterns, thereby enhancing cognitive flexibility (Vago, 2013). This flexibility enables individuals to adjust strategies more quickly and find more effective solutions when facing complex situations (Vago, 2013). Mindfulness meditation is viewed as a multidimensional psychological training method, integrating attention regulation, enhanced bodily awareness, emotional regulation techniques, and shifts in self-perception (Hölzel et al., 2011). The combined effect of these aspects promotes increased levels of mindfulness and optimizes overall psychological functioning (Hölzel et al., 2011). Notably, these psychological changes brought about by mindfulness practice are supported by neuroscience research. Studies have shown that long-term mindfulness practice can lead to plastic changes in brain structure and function, particularly in areas related to attention, emotional regulation, and self-awareness (Hölzel et al., 2011). These neural changes further reinforce the positive impact of mindfulness practice on psychological functioning.

Behavior Change Mechanisms

Mindfulness practice exerts profound positive impacts on individual behavior changes and pro-environmental behaviors through a series of complex psychological mechanisms. Specifically, these mechanisms encompass enhancing attention, reducing self-criticism, improving emotional regulation, and promoting self-management (Schuman-Olivier et al., 2020; Fen & Yu-xia, 2011), further facilitating positive behavioral transformations. The core of mindfulness training lies in cultivating a non-judgmental observational attitude, enabling individuals to perceive present experiences more directly and comprehensively. This enhancement helps reduce incessant rumination, allowing individuals to focus more on current tasks or situations, thereby improving behavioral self-regulation (Baer, 2009). For individuals actively engaged in mindfulness practice, this practice not only awakens their minds and spirits but also encourages them to internalize environmental motivations, enhancing overall well-being (Thiermann & Sheate, 2022). From a neuroscience perspective, mindfulness practice has been shown to be closely related to changes in brain activity and structure. Specifically, in key areas such as the frontal and occipital lobes, mindfulness practice can induce neuroplastic changes, further supporting its potential role in behavior change (Fen & Yu-xia, 2011). However, it is important to note that while these findings provide strong support for understanding how mindfulness influences behavior change, the extent and depth of the impact may still be influenced by the individual's level of commitment to the mindfulness lifestyle and how they integrate mindfulness into their daily informal practices (Thiermann & Sheate, 2022).

CONCLUSION

Violin performance requires the combination of technical precision, physical coordination, and psychological balance. The findings of this research show that mindfulness practice can significantly help students cope with the multiple challenges of violin learning. By improving focus, emotional regulation, and body awareness, mindfulness allows students to practice more efficiently, reduce anxiety, and prevent physical strain caused by repetitive motion or poor posture.

Integrating mindfulness into violin pedagogy connects cognitive and emotional development, aligning with the principles of Self-Regulated Learning and Self-Determination Theory. It enhances autonomy, motivation, and self-reflection, which are crucial for continuous artistic progress. Mindfulness also encourages a shift from mechanical repetition to purposeful and reflective engagement with music, deepening both technical mastery and expressive performance.

In the context of Chinese violin education, especially in areas such as Zhengzhou where educational resources are limited, mindfulness-based approaches offer a simple yet effective solution to improve students' performance and psychological resilience. Music educators are encouraged to incorporate structured mindfulness activities, such as breathing exercises, body scanning, and reflective practice, into daily instruction. This can cultivate musicians who are not only technically skilled but also mentally focused, emotionally stable, and deeply connected with their art.

REFERENCES

- Araújo, R.C., Ferronato, R.S., & Veloso, F.D. (2024). Metacognition in musical practices: two studies with beginner and expert Brazilian musicians. *Frontiers in Psychology, 15*.
- Asare, S., Twum, E., & Amoah, J. (2023). Teaching for the Digital Stage: Preparing Future Music Educators for the ICT-driven Classroom at Colleges of Education. *International Journal For Multidisciplinary Research, 5*(5).
- Aykut, E., & Taş, S. (2023). Gamified Violin Playing in Virtual Reality Based Metaverse Environment. *Journal of Emerging Computer Technologies, 3*(1), 7-11.
- Baer, R. A. (2009). Self-Focused Attention and Mechanisms of Change in Mindfulness-Based Treatment. *Cognitive Behaviour Therapy, 38*(1), 15-20.
- Bateman, A. (2012). Mindfulness. *British Journal of Psychiatry, 201*(04), 297.
- Benton, C. W. (2013). Promoting Metacognition in Music Classes. *Music Educators Journal, 100*(2), 52-59.
- Bernardi, L., Porta, C., & Sleight, P. (2006). Cardiovascular, cerebrovascular, and respiratory changes induced by different types of music in musicians and non-musicians: The importance of silence. *Heart(British Cardiac Society), 92*(4), 445-452.
- Blyskal, E. (2018). *Mindfulness Practice in the Collegiate Voice Studio: A Case Study*. (Publication No.10813557) [Doctoral dissertation, The University of Miami]. ProQuest Dissertations and Theses Global.
- Blyskal, E. (2022). A Case for Mindfulness Practice in the Collegiate Voice Studio, Part 1. *Journal of Singing, 79*, 79-86.
- Bostock, S., Crosswell, A., Prather, A., & Steptoe, A. (2019). Mindfulness On-The-Go: Effects of a Mindfulness Meditation App on Work Stress and Well-Being. *Journal of Occupational Health Psychology, 24*, 127-138.

- Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology*, 84(4), 822-848.
- Byo, J. L., & Cassidy, J. W. (2008). An Exploratory Study of Time Use in the Practice of Music Majors. *Applications of Research in Music Education*, 27(1), 33-40.
- Chang, J., Lin, P., & Seiden, H.M. (2019). Music Performance and Education A Case Presentation of Mindfulness Approach in Higher Education. *Performance and Mindfulness*, 2(2).
- Colombo, B., & Antonietti, A. (2016). The Role of Metacognitive Strategies in Learning Music: A Multiple Case Study. *British Journal of Music Education*, 34(01), 95-113.
- Concina, E. (2019). The Role of Metacognitive Skills in Music Learning and Performing: Theoretical Features and Educational Implications. *Frontiers in Psychology*, 10.
- Czajkowski, A.-M. L. (2018). *Mindfulness for musicians: The effects of teaching 8-week mindfulness courses to student musicians in higher education*. (Publication No. 202252573) [Doctoral dissertation, The University of Leeds School of Music].
- Czajkowski, A.-M. L., Greasley, A. E., & Allis, M. (2020). Mindfulness for musicians: A mixed methods study investigating the effects of 8-week mindfulness courses on music students at a leading conservatoire. *Musicae Scientiae*, 26(2), 259-279.
- Edgar, S. N. (2019). Music and the Social and Emotional Challenges of Undergraduate Instrumental Music Students. *Applications of Research in Music Education*, 37(3), 46-56.
- Fang, J. (2024). The continuity of the didactic principle in teaching violin playing in China. *PHILHARMONICA. International Music Journal*, 1, 9-17.
- Farnsworth-Grodd, V. (2012). *Mindfulness and the self-regulation of music performance anxiety*. [Doctoral dissertation, The University of Auckland].
- Fen, W., & Yu-xia, H. (2011). Psychological and Neural Mechanisms of Mindfulness. *Advances in Psychological Science*, 19(11), 1635-1644.
- Good, D. J., Lyddy, C. J., Glomb, T. M., Bono, J. E., Brown, K. W., Duffy, M. K., Baer, R. A., Brewer, J. A., & Lazar, S. W. (2016). Contemplating Mindfulness at Work: An Integrative Review. *Journal of Management*, 42(1), 114-142.
- Grossman, P., Niemann, L., Schmidt, S., & Walach, H. (2004). Mindfulness-based stress reduction and health benefits: A meta-analysis. *Journal of psychosomatic research*, 57(1), 35-43.
- Hart, J. T. (2014). Guided Metacognition in Instrumental Practice. *Music Educators Journal*, 101(2), 57-64.
- Hernandez-Ruiz, E., & Dvorak, A. L. (2020). Music Stimuli for Mindfulness Practice: A Replication Study. *Journal of Music Therapy*, 58(2), Summer, 155-176.
- Hildebrandt, H., Nübling, M., & Candia, V. (2012). Increment of fatigue, depression, and stage fright during the first year of high-level education in music students. *Medical problems of performing artists*, 27(1), 43-48(6).
- Hofmann, S. G., Asnaani, A., Vonk, I. J., Sawyer, A. T., & Fang, A. (2012). The efficacy of cognitive behavioral therapy: A review of meta-analyses. *Cognitive Therapy and Research*, 36(5), 427-440.
- Hölzel, B. K., Carmody, J., Vangel, M., Congleton, C., Yerramsetti, S. M., Gard, T., & Lazar, S. W. (2011). Mindfulness practice leads to increases in regional brain gray matter density. *Psychiatry Research: Neuroimaging*, 191(1), 36-43.
- Hölzel, B. K., Lazar, S. W., Gard, T., Schuman-Olivier, Z., Vago, D. R., & Ott, U. (2011). How Does Mindfulness Meditation Work? Proposing Mechanisms of Action From a Conceptual and Neural Perspective. *Perspectives on Psychological Science*, 6(6), 537-559.
- Hyland, T. (2014). Mindfulness-based interventions and the affective domain of education. *Educational Studies*, 40(3), 277-291.
- Ivanovski, B., & Malhi, G. S. (2007). The psychological and neurophysiological concomitants of mindfulness forms of meditation. *Acta Neuropsychiatrica*, 19(02), 76-91.
- Isbel, B., & Mahar, D. (2015). Cognitive mechanisms of mindfulness: A test of current models. *Consciousness and Cognition*, 38, 50-59.
- Jacobson, E. (1938). *Progressive Relaxation*. University of Chicago Press.
- Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed methods research: A research paradigm whose time has come. *Educational Researcher*, 33(7), 14-26.
- Kabat-Zinn, J. (1990). *Full Catastrophe Living: Using the Wisdom of Your Body and Mind to Face Stress, Pain, and Illness*. Dell Publishing.
- Kerner, E. (1969). Violin Practice Pain Is Pleasure's Cost. *Music Educators Journal*, 55(8), 65-72.
- Kim, S. J. (2010). A Study of Self-Regulated Learning in College String Majors. *String Research Journal*, 1(1), 39-54.
- Li, W. (2020). Thoughts on the Teaching of Violin in Normal University under the New Circumstances. *Francis Academic Press*, 3(10), 28-30.

- Marchand, W. R. (2014). Neural mechanisms of mindfulness and meditation: Evidence from neuroimaging studies. *World Journal of Radiology*, 6(7), 471.
- McCrary, J., Halaki, M., & Ackermann, B. (2016). Effects of Physical Symptoms on Muscle Activity Levels in Skilled Violinists. *Medical problems of performing artists*, 31(3), 125-31 . <https://doi.org/10.21091/mppa.2016.3024>.
- McPherson G. E., Renwick J. M. (2001). A longitudinal study of self-regulation in children's musical practice. *Music. Educ*, 3, 169-186.
- McPherson G. E., & Zimmerman B. J. (2011). Self-regulation of musical learning: a social cognitive perspective on developing performance skills, in MENC Handbook of Research on Music Learning. *Applications, eds Colwell R., Webster P. (New York, NY: Oxford University Press;), 2, 130-175.*
- Mieder, K., & Bugos, J. A. (2017). Enhancing self-regulated practice behavior in high school instrumentalists. *International Journal of Music Education*, 35(4), 578-587.
- Miksza, P. (2006). An Exploratory Investigation of Self-Regulatory and Motivational Variables in the Music Practice of Junior High Band Students. *Contributions to Music Education*, 33, 9.
- Miksza, P. (2007). Effective Practice. *Journal of Research in Music Education*, 55(4), 359-375.
- Miksza, P., & Tan, L. (2015). Predicting Collegiate Wind Players' Practice Efficiency, Flow, and Self-Efficacy for Self-Regulation. *Journal of Research in Music Education*, 63(2), 162-179.
- Mio, V. A. (2019). The Need for Remedial Pedagogy in Undergraduate Violin Instruction: A Case Study of Postsecondary Instructors' Perceptions. *Applications of Research in Music Education*, 37(3), 36-45.
- Mohammadi, S., Bagheri, F., & Farokhi, N. (2020). Mindfulness Training on Negative Emotions/Emotional Instability and Adaptive Emotion Regulation in Students. *Middle Eastern Journal of Disability Studies*, 10, 62-62.
- Nielsen, S. G. (2004). Strategies and self-efficacy beliefs in instrumental and vocal individual practice: a study of students in higher music education. *Psychology of Music*, 32(4), 418-431.
- Pavel, A. (2023). Predominant Mental Processes in Musical Activities. Bulletin of the Transilvania University of Braşov. *Series VIII: Performing Arts*. 173-182.
- Rensing, N., Schemmann, H., & Zalpour, C. (2018). Musculoskeletal Demands in Violin and Viola Playing: A Literature Review. *Medical problems of performing artists*, 33(4), 265-274 .
- Scott, L. (1992). Attention and Perseverance Behaviors of Preschool Children Enrolled in Suzuki Violin Lessons and Other Activities. *Journal of Research in Music Education*, 40(3), 225-235.
- Steinfeld, M., & Brewer, J. (2015). The Psychological Benefits from Reconceptualizing Music-Making as Mindfulness Practice. *Medical Problems of Performing Artists*, 31(2), 90-95.
- Tremayne, P., & Morgan, A. (2016). Attention, centering, and being mindful: medical specialties to the performing arts. In A. L. Baltzell (Ed.), *Mindfulness and performance*, 389-411.
- Vago, D. R. (2013). Mapping modalities of self-awareness in mindfulness practice: a potential mechanism for clarifying habits of mind. *Annals of the New York Academy of Sciences*, 1307(1), 28-42.
- Vilnite, F.M., & Marnauza, M. (2023). Thinking ahead: the use of mental training in young violinists' skill development. *Music Education Research*, 25, 545-561.
- Vilnite, F.M., & Marnauza, M. (2024). Repetition and practice. Developing mental training with young violinists: a collaboration. *Frontiers in Psychology*, 15.
- Schuman-Olivier, Z., Trombka, M., Lovas, D. A., Brewer, J. A., Vago, D. R., Gawande, R., ... Fulwiler, C. (2020). Mindfulness and Behavior Change. *Harvard Review of Psychiatry*, 28(6), 37-394.
- Segal, Z. V., Williams, J. M. G., & Teasdale, J. D. (2004). *Mindfulness-Based Cognitive Therapy for Depression: A New Approach to Preventing Relapse*. Guilford Press.
- Thiermann, U.B., & Sheate, W.R. (2022). How Does Mindfulness Affect Pro-environmental Behaviors? A Qualitative Analysis of the Mechanisms of Change in a Sample of Active Practitioners. *Springer Nature*, 13(12), 2997-3016.
- Zeidan, F., Johnson, S. K., Diamond, B. J., David, Z., & Goolkasian, P. (2010). Mindfulness meditation improves cognition: Evidence of brief mental training. *Consciousness and cognition*, 19(2), 597-605.