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Neuroscientific Perspectives on How Higher Music Education Aids Youth in Adapting Psychosocially to War Conditions

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Abstract: *The article delves into the difficulties of psychosocial adaptation faced, by young students during wartime. It investigates strategies to aid students in their university experience, nurturing the development of personal values, creative expression of cultural and spiritual ideals, conscious self-improvement and readiness for meaningful societal participation, with a focus on the importance of musical and aesthetic education. Student youth, representing a socially active demographic, plays a vital role in today's society. A key objective in educating young professionals during wartime should prioritise spiritual development, reinforcing moral and ethical foundations among the next generation, and cultivating individuals of refined cultural sensibilities, exemplifying the present-day intellectual elite. Musical compositions reveal the subtle nuances and unspoken impulses of this exploration, connecting with listeners, not only on a conscious level, but also through unconscious, subtle "channels" of communication. These channels leave a lasting impression on one's psycho-physiological and psychological depths, subtly shaping their spiritual outlook. War has spurred the evolution of new modes of musical education, including online courses and military musical groups. These innovative approaches enable individuals to pursue musical learning and skill development even amidst challenging circumstances.*

Keywords: *self-realisation; adaptation; online education; resources; opportunities.*

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1. Introduction

Every military conflict leads to profound changes in all aspects of social life, including education. Musical education is not an exception, as it is also affected by wartime. Indeed, war can pose numerous obstacles to the educational process, as well as to the professional development of music teachers.

As Kondratenko, Rohovets, and Borshch (2022) suggest, the impact of World War II on musical education is rather ambiguous and complicated. The war considerably complicates the functioning of educational institutions. At the same time, it prompts the creation of new formats of musical education, thus highlighting the importance and resilience of musical culture under such conditions. In the context of musical education, these approaches are becoming more and more relevant since they are an integral part of educational work. Besides, they take into account the specifics of music and its role in society. As is known, music reveals the deep meanings of being, as well as the ideology of its composers, performers, and listeners. Consequently, music mirrors both the cultural and social reality. Münte, Altenmüller, and Jäncke (2002) focus on the neuropsychological influence of music.

The authors of this article believe that music stimulates the secretion of endorphins, which can act as natural painkillers and have antidepressant effects. It is especially beneficial for young people as they decrease their stress and anxiety levels. To cope with wartime challenges, many music educational institutions have switched to adaptive online learning formats. It allows students to participate in the educational process regardless of their physical location. Such innovations include numerous online projects that enable interactive communication with peers and participation in different competitions and festivals, as well as access to educational materials.

Accordingly, this article aims to a) analyse the key aspects of war's influence on young people's psychosocial adaptation, b) describe the changes in musical education imposed by World War II and the current war in Ukraine, and c) investigate the neuroscientific factors that can contribute to youth adaptation through music education during wartime.

2. Impact of War on Psychosocial Adaptation of Youth

The effects of war on the psychological and social state of young people have been extensive, bringing forth additional challenges and potential harm.

As it is known, military conflicts can result in different social and psychological problems with which one can find it difficult to cope. In turn, music strategically navigates such processes as relaxation and stress relief by reducing the levels of the stress hormone (cortisol). It fosters emotional well-being through its soothing effect. At the same time, engaging in musical activity, one can share one's life path and gain the necessary support (Hodges et al., 2020).

Indeed, music plays an integrative function in culture. Learning music and performing folk songs assist young people in maintaining a connection with their heritage and feeling a sense of belonging to their nation. Music can imbue youth with purpose and new aspirations amidst challenging life circumstances, aiding them in self-discovery and defining their life path. While higher music education is not a universal remedy for all challenges, it serves as an important resource for youth to navigate the psychosocial impact of war and adjust to new life circumstances (Wang et al., 2022).

Many music schools and higher music education institutions continue to operate online even during times of war. This enables young people to continue their education and receive music lessons, which can be an essential factor in psychosocial adaptation to challenging life circumstances. Below are a few examples of such online initiatives (see Table 1).

Table 1. Online initiatives taken by music schools and higher music education institutions in Ukraine

Institution Name	Online Learning Format
The National All-Ukrainian Music Union	Online concerts, workshops, lectures;
Mykola Lysenko Lviv National Music Academy	Online classes for students, online concerts, competitions;
Glier Kyiv Municipal Academy of Music	Online preparatory courses, online classes for students;
Kharkiv I. Kotliarevsky National University of Arts	Online concerts, workshops, lectures;

Source: the authors' own conception

Additionally, many new music projects have emerged to help young people manage the psychological and social sequelae of war. These projects provide youth with opportunities to externalise emotional states through music, receive support from like-minded individuals, and make new friends:

- Music for Peace: it organises online concerts and charity actions to raise funds for Ukrainians affected by the war.
- Art of War: it collects and publishes stories of Ukrainian musicians affected by the war.
- Music of Hope: it organises online music therapy sessions for people impacted by the war.

Online music education and music projects do not comprehensively replicate in-person learning. However, they serve as valuable resources for young people to continue developing their musical skills, receive support, and find meaning in life, especially in adverse psychosocial conditions. Indeed, online higher music education and music projects do not entirely substitute face-to-face learning. In-person learning allows for personalised feedback from instructors and opportunities for communication and collaboration with classmates.

Misic et al. (2010) assert that online learning is effective for acquiring theoretical knowledge and skills. Simultaneously, practical experience is essential for their reinforcement and development, which is more readily available through face-to-face instruction under experienced guidance. Students and their parents commonly face obstacles in the setup of the equipment necessary for it.

Technical difficulties, including low-quality audio, video interruptions, and delays, can negatively impact the effectiveness of such learning. Moreover, the lack of practical feedback from teachers makes it more challenging to identify and correct technical mistakes.

Online learning cannot completely replace an offline format, especially when it comes to acquiring practical skills, such as playing musical instruments. The inability to play in an ensemble or orchestra deprives pupils of an important social aspect of learning. Indeed, learning from home, they often fail to concentrate, while their motivation decreases because of the restrictions in personal communication with the teacher and peers. Furthermore, using high-quality online platforms requires considerable financial resources, which are not available to all families.

Music helps individuals to express the feelings that are difficult to describe with words and promotes emotional relief. Participating in musical projects, young people have the opportunity to meet like-minded individuals who relive similar situations. Besides, music allows one to develop new social relationships, escape from traumatic experiences and establish new life goals.

To unlock the potential of these projects, it is crucial to ensure their wider dissemination to the wider public. One should spread information via social media and provide financial and volunteer support, as well as share the necessary details with those it may concern. Only joint

efforts can help young people cope with the psychosocial consequences of the war and create a better future for Ukraine.

Thus, music lessons serve as a powerful tool of adaptation. They can decrease the levels of stress and anxiety, boost self-esteem, improve social and communication skills, preserve the cultural identity and find new life meanings. Music education has the capacity to become one of the most important factors in young people's psychosocial adaptation under wartime conditions.

3. The Impact of World War II on Higher Music Education

Higher music education continued to exist even during World War II. Despite considerable hardships and changes, many music education institutions managed to adapt to the new reality. The armed conflict had a profound and multifaceted impact on the system of higher music education.

On the one hand, the war caused severe disruptions to the functioning of educational institutions: many were destroyed; infrastructure was damaged; and teachers and students were either killed or forced to emigrate. It not only deprived music education of its talent and expertise but also created significant challenges for the post-war reconstruction of musical institutions. As a result, it negatively affected access to education and led to the loss of a cultural learning environment.

Despite the mentioned difficulties, the educational process in many universities did not lose its dynamics. In some cases, it was decided to shorten the learning period by increasing lesson duration up to 8-10 hours per day and reducing the holiday breaks. This fact proves the striving to maintain high educational standards even under wartime conditions.

During the initial wartime examination session in the spring of 1942, numerous students were subjected to an examination load of up to 12 subjects. Despite this, the students persevered and prepared intensely for the session, evidenced by a notable increase in visitors to reading rooms and libraries, which remained open until nine in the evening. Adherence to labour and academic discipline was paramount, with a tardiness of 25 minutes considered an absence and referred to a people's court.

Absences from military and sports activities were severely punished, including potential exclusion from the university. Students, teachers, and university staff participated in "Vseovobuch" (Universal Military Training), with men aged 16 to 60, focusing on shooting and chemical warfare, while women aged 16 to 55 engaged in military-medical services and chemical warfare. Many institutes designated Tuesday as the sole defence day and established self-defence teams, comprising fire, rescue, medical, chemical, and pioneer squads, stationed within institute buildings.

The first semester of the 1942-1943 academic year saw a surge in student activity, particularly as the Red Army began achieving historic victories against Nazi invaders. During the summer, capable students and a significant portion of teachers and staff willingly aided in logging and agricultural work on collective farms, alongside repairs to damaged residential buildings.

Students actively participated in subsidiary farming, planting crops such as potatoes, cabbage, and beets, and tending to fields. The harvested produce often supplemented the institute's dining halls.

Despite ongoing challenges, such as temporary stoves in classrooms and offices and a reduced class schedule, students generally succeeded in the winter examination sessions. Following the war, higher music education underwent a period of recovery and growth, with many music institutions restored and new ones established.

4. Neuroscientific Aspects of Higher Music Education as a Factor of Youth Adaptation in Wartime

War presents new challenges to the psychosocial well-being of young people. Higher music education can play a significant role in helping youth adapt to these changing circumstances. Neurobiological studies indicate that music education has beneficial neuroplastic effects, potentially aiding individuals in coping with the psychological impacts of war.

Music can stimulate endogenous release of endorphins, which have pain-relieving and affective modulation. This can help young people reduce stress and anxiety, common experiences during wartime. Mastering musical skills and achieving success in musical activities provide youth with a sense of competence and self-assurance, contributing to enhanced self-esteem and self-respect, particularly important in the face of trauma. Moreover, engaging in musical activities allows individuals to connect with like-minded peers, foster empathy, and develop teamwork skills. This can support youth in nurturing social and communicative abilities that may be disrupted during times of war (Pynoos, Steinberg, & Piacentini, 1999). Music holds a crucial place in Ukrainian culture. Learning Ukrainian music and performing traditional Ukrainian songs helps young people maintain ties to their heritage and feel connected to the Ukrainian community, safeguarding their cultural identity during turbulent times.

Nerubasska and Maksymchuk (2020) believe that music can instill a sense of purpose and new aspirations in young people facing complex life circumstances. This can motivate them to move forward, even amidst seemingly interminable war. It is important to note that neurobiological studies on the impact of music on the human brain are still in the early stages. More research is needed to better understand how music can help youth cope with the psychological consequences of war. However, higher music education can be a significant factor in assisting youth to adapt to new circumstances. Music education can help young people regulate emotional distress, enhance self-esteem and self-respect, develop social skills and communication, preserve cultural identity, and find meaning and new goals in life. Table 2 depicts the neurocognitive influence of music on the brain: neurobiological processes and their effects.

This makes higher music education a valuable resource that can assist youth in coping with the psychological consequences of war and building a better future for Ukraine. Neuropsychological studies show that engaging with music can positively impact cognitive, emotional, and behavioural functions, which can help individuals cope with the psychological consequences of war.

Several neuropsychological mechanisms may mediate the positive impact of music education on youth adaptation in wartime conditions. They are as follows: increased attentional focus, improved memory, development of creativity, reduced levels of stress and anxiety, strengthened self-concept, and identity validation. Music can stimulate activity in the frontal lobes of the brain, responsible for attentional focus, aiding youth in better concentrating on learning and other important tasks.

Table 2. The impact of music on the brain: neurobiological processes and their effects

Neurobiological Process	What Happens in the Brain	Psychosocial Benefits
Brain plasticity	Formation of new neural connections (synapses) and recruitment of additional cortical areas	Enhanced learning capacity, adaptability, and creativity.
Network activation	Simultaneous activation of auditory, motor, limbic, and memory-related brain regions	Improved cognitive functions such as attention, focus, and memory.
Neurotransmitter secretion	Increased release of dopamine, serotonin, and oxytocin.	Boosted mood, reduced stress, and strengthened social connections.
Results	Improved cognitive abilities: attention, focus, memory, and learning. Development of language skills. Enhanced emotional intelligence. Lower stress and anxiety. Better social skills.	

Source: the authors' own conception

Neuroimaging-based evidence and results from longitudinal studies will significantly strengthen the case for music's impact on the brain.

fMRI scans can capture images that reveal increased activity in specific brain regions during musical performance and perception tasks. These scans enable comparative analysis of neural responses between musicians and non-musicians, both while listening to music and while playing an instrument.

Anatomical models can create schematic representations of the brain, highlighting structural neuroplastic adaptations due to musical training. Dynamic graphs will illustrate how certain parameters, such as cognitive abilities and emotional intelligence, evolve in children engaged in music.

Sheremet et al. (2019) suggest that music can promote the development of new neural connections in the hippocampus, which is crucial for memory function. This enhancement may assist youth in retaining information more effectively and recalling memories. Additionally, music can stimulate right-hemispheric cortical regions of the brain, associated with creativity, aiding youth in developing innovative problem-solving approaches and generating fresh ideas.

5. Conclusion

The significance of the article lies in highlighting how students can leverage their musical abilities to aid those affected by war, such as organising concerts in hospitals or for displaced individuals. It underscores that music education plays a pivotal role in students' psychosocial adaptation to new circumstances. Music education not only reduces stress and anxiety but also enhances perceived self-worth, fosters social skills and communication, preserves cultural identity, and helps individuals find purpose and new life goals.

The article illustrates that mastering musical skills and achieving success in musical activities instills young people with a sense of competence and self-assurance, which can be particularly beneficial in navigating trauma recovery. Music offers a positive outlet for youth, steering them away from negative behaviours and providing motivation and direction in enduring wartime conditions.

Importantly, the article explores important facets of how war affects the contextual resilience mechanisms of youth and examines the impact of World War II and the war in Ukraine on higher music education. It also investigates the neuroscientific aspects of how music education helps youth adapt during wartime.

Thus, in times of war, online music education and musical projects serve as crucial resources, enabling youth to continue developing their musical skills, receiving support, and discovering meaning in their lives.

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