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AN ATTEMPT TO INTRODUCE SOUND IMPROVISATION IN PRE-SERVICE TEACHERS' MUSIC EDUCATION

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Abstract. It is widely recognized that the sound of vibrational percussive instruments could contribute to relaxation, mindfulness, and stress reduction. We attempted to introduce these instruments in the pre-service teacher music education. Workshops were designed to include listening instruments, improvisation, sound production and expression of the experience through drawing. A total sample of 130 students from two universities Faculty of Educational Sciences Sarajevo, the Academy of Fine Arts Sarajevo, and the Faculty of Education at the University of Ljubljana, were enrolled in the study. The study aims to explore how students perceived our attempt and if their perceptions are related to the use of music in everyday life. Before the workshop students reported how they regulated mood through music (The Brief Music in Mood Regulation scale i.e., B-MMR). Students' experiences of the workshops were measured through three-dimensional (affective, cognitive, and conative) connotative differential scales (CD-9). Results reveal that student's workshop experiences have a positive meaning in the semantic space. The differences between students from different universities were not statistically significant. Positive affective - evaluative adjectives (pleasant, attractive, and good) have the most important role in describing experiences. Also, highly engaged music users who regulate different moods through music had a stronger tendency to describe workshops' experiences with positive affective adjectives. The implications of the results for the future use of the introduction sound play and improvisation in teachers' music education will be discussed.

Key words: pre-service teachers, music education, vibrational percussive instruments, sound improvisation, music mood regulation.

Introduction

In the past decade, within the framework of the STEAM approach, it has been increasingly recognized that instruction in the arts can be integrated with science, mathematics, technology, and engineering, and that the so-called infusion of the arts enables a different approach to knowledge that broadens the scope of other disciplines. In this approach, art education is identified as essential for fostering initiative and creative imagination (Wynn & Harris, 2012). For example, introducing musical themes helps students grasp basic physical laws (Andreotti & Frans, 2019). Within the STEAM framework, the arts are granted a significantly more favourable position compared to being treated as a less important subject (Wynn & Harris, 2012). Research confirms that pre-service teachers often show reluctance to engage in teaching art subjects, sometimes coupled with low self-efficacy (Garvis, 2009). The emerging conclusion is that university education should act proactively so that future teachers can teach art subjects in a more flexible, responsive, and competent

manner (Hudson, 2007). The importance of creating space for personal musical/visual improvisation, imagination, and reflection on experiences is increasingly acknowledged, with the goal of enhancing readiness to include artistic components (Gibson & Ewing, 2005; McLaren & Arnold, 2016). Teaching activities that centre on the student and the development of all human potential are met with a positive response, motivation, joy in creation, and collaborative learning. Unfortunately, although this is well known in theory, the facts indicate an underutilized potential of art subjects across different educational levels and in the development of creativity. Curricula are generally too extensive, leaving teachers with little time and space for more creative teaching approaches, individual work, deeper understanding of subject matter, and the acquisition and application of various skills and forms of knowledge. Montgomery's research (Montgomery, 2018; as cited in Ferrari, Cachia & Punie, 2009) showed that over 70% of class time is spent on teacher lecturing, which supports the notion of minimal experiential learning. Twelve to fifteen weeks in a semester is often insufficient to meet pedagogical standards; the lack of adequate space and working conditions also significantly impedes the implementation of teaching activities. More active participation in knowledge creation, workshops, discussions on assigned topics or ideas, and evaluation of knowledge can significantly overcome common obstacles and increase intrinsic motivation (Woods & Jeffrey, 1996; as cited in Craft, 2005). The division that exists between school subjects, the breaking down of units into the smallest details, researchers' focus on narrow scientific fields, and analytical methods all contribute to the problem of disintegration in the educational process and in science (Mendeš et al., 2012). A study conducted in Ireland (Hayes et al., 2021) is an example of empowering and motivating teachers by involving, in addition to 12 teachers, two visual artists in the educational process. This collaboration mutually empowered the teachers to "step outside their comfort zone," to frequently ask children "What do you want to do?" and "not to fear the creative process through play when working with children." A working environment full of colours, different textures, shapes, and various visual techniques proved equally stimulating for all participants. The entire program was designed to encourage teachers to break away from templates in working with children and to better understand children's creativity. Many countries, including Ireland and the United Kingdom, still prioritize mathematics and languages over art subjects (Martin et al., 2013). This research shows that with proper support and qualified personnel, artistic activities can be successfully integrated into everyday activities in educational institutions. The teacher's role is to observe and document creative processes in children, encouraging expression through various media (Karić Camović, 2023). The author Rinaldi (2006) proposes a pedagogy of listening based precisely on observing and documenting children's work in order to make their experiences visible. Adults working with children often lack patience, focusing on the final achievement or product rather than the process. Teachers are very prone to embellishing children's creations and musical interpretations, placing everything into certain templates or musical patterns. Standards that apply to creativity in adulthood are not appropriate for children's developmental stage (Adams & Chen, 2012). Runco (1999) distinguishes between expressive and productive components of creativity, emphasizing that children are creative, but that this does not necessarily mean the creative process must result in a specific product.

Sound play, which is insufficiently used in developing auditory sensitivity, can also significantly stimulate children's creative potential. A study (Zećo et al., 2024) on improvisation through sound - play with six-year-olds using vibrational percussion instruments in a typical school setting showed positive results. The sound workshops helped children adapt, fostering group interaction, perspective-taking, cooperation, tolerance, and overall socio-emotional cohesion. Spontaneous sound improvisations and guided fantasies encouraged children's imagination, movement, and the creation of imaginative stories about musical instruments. Using figurative imagination (Reihling, 1997), various metaphors for sound were employed, such as "cold," "warm," and "heavy." This demonstrated that children's capacity for active listening and imagination is much greater than expected. Most

parents (35 parents or 83.3%) confirmed that such activities are highly desirable during the adaptation period or at school entry. The study confirmed that unconventional musical instruments can serve as a medium for fostering spontaneous improvisation, cultivating pleasant sound experiences, and generally sensitizing children to sound frequencies and relaxation techniques. Sound improvisations facilitated transition and adaptation in a child with developmental difficulties. It is important to emphasize that the entire sound cycle successfully motivated all six-year-old participants equally in the workshops, regardless of their talent or differences in musical abilities.

Guided Improvisation in Teaching

Numerous studies highlight the advantages of learning through improvisation and collaborative learning (Holzman, 1997; Sawyer, 2019; 2012; 2004). Improvisation (Sawyer, 2019; as cited in Pušina, 2020) is described as a form of teaching in which educators provide freedom for students to explore and construct their own understanding of the content they are engaging with. Creative education is often associated with notions of free, spontaneous expression and exploration, and it can be conducted within structured, efficient conditions of defined boundaries, that is, within the framework of humanistic education. The improvisational construction of knowledge by an experienced teacher can be guided in a way that directs students toward deep learning; it is possible to develop curricula, prepare lessons, and use instructional strategies while offering enough freedom for students to construct their own knowledge and skills, all while respecting the standards of the educational institution (Bransford et al., 1999).

Improvisation, whether on stage or in a workshop setting, promotes the principles of collaborative learning, never yielding control of the creative process to a single participant, but instead focusing on a shared process of creation that entirely depends on the group as a whole. The idea of one group member gains its full meaning only in relation to the response or reaction of other participants and the way in which they utilize it. Everything exists in constant mutual coexistence — no single group member determines the final outcome of the improvisation; rather, the group constructs it collectively (Sawyer, 2004, as cited in Kostović et al., 2011). In "creative classrooms," students can freely experiment with their knowledge, apply what they have learned, and connect it to subsequent lessons, that is, think beyond the constraints of the given information. The introduction of improvisation and spontaneous expression in music education is a longstanding idea, primarily because musical notation was not widely accepted in everyday musical practice for a long time. From ancient civilizations up to the 18th century, improvisational skill was especially valued in musical interpretation and education, where music was largely transmitted orally. Performers relied heavily on their musical memory, technical skill on instruments, and the development of musical thinking (Kazić, S. 2019). With the establishment of various methods and procedures in the systems of solmization, rhythm training, and musical dictation in the 19th century, less space was left for creative processes and improvisation. In the 20th century, Emile Jaques-Dalcroze (Anderson, 2012; Jaques-Dalcroze, 1930) refocused attention on rhythm, and through his method of Eurhythmics, emphasized the importance of musical communication through the senses, musical instinct, rhythm, and improvisation.

Musical improvisation is, in fact, a complex phenomenon and can be observed not only from the perspective of music pedagogy but also from musicology, music therapy, and music psychology, depending on the implications and goals of the research (Abrahan, & Justel, 2022). The first association with improvisation is often a particular musical genre, such as jazz, which implies a high level of performance skill and often formal musical training (Pressing, 1988; MacDonald, & Wilson, 2012). In pedagogy and music therapy, musical improvisation is frequently understood as a process rather than a product or composition with a defined structure (Alexakis et al., 2013). Research in music psychology, musicology, and music pedagogy describes musical improvisation as an interactive model for intersubjective communication between participants (Laroche & Kaddouch, 2015; MacDonald & Wilson, 2005; Procter, 2016; Wilson & MacDonald, 2014). Procter (2016)

describes improvisation in his research as the creation of music with a particular focus on musical interaction, while MacDonald and Wilson (2014) view the act of improvisation as a profound sociological phenomenon, wherein at least two individuals spontaneously create sound or music in a specific moment.

Improvisation in music or social interaction creates opportunities for a variety of experiences, possibilities, and music therapy interventions (D'Ausilio et al., 2015; Moran, 2014; Walton et al., 2018). A study by Abrahan, Justel & Shifres (2022) on the differences between musical improvisation and rhythmic imitation in social interaction and communication, confirmed that improvisation is a collective and social act. The results showed that in improvisation, nonverbal communication appears far more frequently, the musical impulse is connected to the responses of other individuals in the group, and the flow and dynamics of sound/music follow the energy of collective music-making. Improvisation, or optimal experience, implies being so absorbed in the activity that one forgets about time, fatigue, and everything else except that activity (Csikszentmihalyi et al., 2005). The state of optimal engagement can be defined as deep concentration and a sense of enjoyment, with intrinsic motivation as the key factor (Csikszentmihalyi, 2006). The feeling of complete absorption, or "flow," does not occur by chance and is not the result of random circumstances.

Guided by the idea that workshop-based activities could stimulate motivation and offer a new experience for students, this study designed sound workshops in collaboration with two universities. The collaborative work of two instructors from two different artistic disciplines created a safe space for exploration, relaxation, and the creation of sound and image. Students were tasked with painting their experience while actively listening to sound improvisation, using abstract forms and avoiding any templates. Active listening to sound improvisation during the workshops created opportunities for social communication through drawing. Deep immersion in sound or music during improvisation or active listening represents one of the most important functions of music listening (Arnett, 1995; Saarikallio, 2011). Regarding emotional regulation, music may serve a dual function: on the one hand, it can assist in managing stress and negative emotions; on the other, it can elicit positive emotions and a state of relaxation (Saarikallio & Erkkila, 2007; Saarikallio, 2011). Our assumption is that the experience of the workshops, in the context of this research, would be more intense and positive among those pre-service teachers who habitually use music as a tool for emotional regulation.

Research Aim

The aim of the study was to explore how pre-service teachers experience workshops that combine sound with drawing, utilize imagination, and encourage improvisation and relaxation, as well as to examine how their experience is related to the way they typically use music to regulate their own mood.

Workshop Description

In collaboration with the Faculty of Educational Sciences at the University of Sarajevo, the Academy of Fine Arts in Sarajevo, and the Faculty of Education at the University of Ljubljana, and within the framework of Erasmus mobility, workshops were organized that connected two disciplines — music and visual art. Care was taken to ensure that each workshop lasted between 45 minutes and one hour, with a prepared space and lighting, and students were given the freedom to choose their position in the room during active listening. One of the most important aspects during the listening of sound improvisation was preparation — an introductory phase designed to enhance focus and concentration in order to encourage active participation. In this way, the likelihood of accepting the sound improvisation on a personal level is increased.

The sound improvisation was experienced through the performance of specific rhythmic patterns, dynamic gradation on the instruments, elements of silence, and active communication with the workshop participants. An atmosphere was created in which students felt comfortable and relaxed, free from the pressure of evaluation or testing. In the

introductory part, students were prepared for active listening through simple breathing and relaxation techniques. Rhythmic patterns and dynamic nuances on musical instruments such as the ocean drum and similar percussion instruments were used to evoke the sound of wind or water, creating a sonic soundscape conducive to relaxation and improved focus for all participants.

Among the musical instruments used were three different Peter Hess therapeutic singing bowls: a small bowl (frequency range between 200 and 1,200 Hz), a medium bowl (frequency range between 100 and 1,000 Hz), and a large bowl (frequency range between 100 and 2,800 Hz) (Hess, 2008). Among other percussion instruments, a central place was given to the planetary gong Venus tuned to tone A2 (221.23 Hz). The idea of producing planetary gongs was initiated by a team of experts led by Jens Zygar, with the primary intention of using them for therapeutic work and meditation (Cousto, 2015). The entire soundscape-based approach to improvisation was further enriched by the sound of Koshi chimes. These instruments consist of a set of eight chords inside a resonant bamboo tube, producing specific overtones and sound colours. Koshi chimes are divided into four types, inspired by the four elements of nature, each with its basic melody: earth, water, air, and fire (Whittaker, 2010). During the improvisation, the element of silence or pause was also utilized, guided by the idea of a sound space that, through its frequencies, supports techniques of relaxation and calm.

For the evaluation of the aesthetic experience, the semantic differential scale, specifically the Connotative Differential Scale (CD-9) was used. This questionnaire was completed by the participants immediately after the workshops. The scale consists of nine pairs of opposing adjectives. There are studies confirming that this scale meets the criteria for reliability and validity in assessing aesthetic experience, both in adults and children (Janković, 2000; Trkulja & Janković, 2012). Participants were asked to rate, on a scale from -3 to 3, which pole of the given adjective pairs best represented their experience of the workshops. The scale covers three dimensions of aesthetic experience: conative (adjective pairs: unimpressive–impressive, unexciting–exciting, weak–strong), cognitive (unfamiliar–familiar, abstract–concrete, unclear–clear), and affective (unpleasant–pleasant, unattractive–attractive, bad–good). Each participant received a score on each of the aesthetic experience dimensions.

Sample and Procedure

The sample was convenient and included 130 students. It consisted of students from three faculties (Table 1). As expected, considering the composition of these faculties, 95% of the sample was female. The average age was 23, which corresponds to the general student population.

Table 1

Sample structure: Faculty of Educational Sciences, University of Sarajevo; Faculty of Education, University of Ljubljana; Academy of Fine Arts, Sarajevo.

	Frequency	Percent	Valid Percent	Cumulative Percent
1	86	66,2	66,2	66,2
2	27	20,8	20,8	86,9
3	17	13,1	13,1	100,0
Total	130	100,0	100,0	

Results

Descriptive results of the study showed that students' experiences of the workshops were positive across all three dimensions (Table 2). Participants scored statistically significantly higher on the conative ($t = 8.22$; $p < 0.001$) and emotional dimensions ($t = 9.68$; $p < 0.001$) compared to the cognitive dimension. Furthermore, the emotional dimension was even more

pronounced than the conative, although the difference was not large (t = 2.67; p = 0.009). In other words, participants reported a positive experience across all three dimensions. When examining the scores on individual adjective pairs, it is evident that participants primarily perceived the workshop as a pleasant and good experience, which was striking, attractive, and stimulating (mean scores above 2). Additionally, regarding the negative pole of the cognitive adjective pairs, the experience was described as abstract and unfamiliar (mean values below 1). In conclusion, the workshops were perceived as a pleasant experience that encourages action, while also representing something new and unfamiliar.

Table 2
Aesthetic Experience: Mean Scores on Dimensions

	N	Minimum	Maximum	Mean	Std. Deviation
Conative	126	-3,00	3,00	2,0212	1,17889
Emotional	127	-1,00	3,00	2,2178	1,04179
Cognitive	126	-3,00	3,00	1,0608	1,31345
Valid N (listwise)	123				

This experience of the activity did not differ among participants from different faculties, nor was the correlation with age statistically significant.

To examine the relationship between how participants regulate emotions through music and how they experienced the workshops, three linear regressions were conducted. The independent variables were the dimensions of the workshop experience, and the dependent variables were the seven strategies of emotion regulation. The analysis showed that emotion regulation strategies were not good predictors of the conative (R^2 = .06, F (7, 112) = 1.03, p = .481) and cognitive (R^2 = .07, F(7, 112) = 1.31, p = .255) dimensions of experience. On the other hand, 11% of the variance in the emotional dimension was explained by emotion regulation strategies (R^2 = .12, F(7, 112) = 2.13, p = .05). However, analysis of the individual contributions of each strategy revealed that none of the predictors were statistically significant.

These results suggest that prior experience with music—specifically, its use for emotional regulation—does not pose a barrier to having a positive experience of the workshops.

Discussion

This study demonstrated that the sound of vibrational percussive instruments can evoke positive and activating emotions. Various authors (Behne, 1997; DeNora, 1999; Larsen, 2000; Ruud, 1997; Sloboda, 1992; Sloboda & O'Neill, 2001) have confirmed that music is generally a medium for relaxation, emotional expression, and the physical processing and release of various emotional states. The pressure of obligations, various transitions, and challenges encountered during studies bring with them an increased level of stress for the average person in the education system. The concept of active listening to vibrational percussion instruments with specific sound frequencies that resemble natural sounds is an increasingly common relaxation technique. Studies (Zećo, 2025; Pesek & Bratina, 2016; Koller & Grotz, 2010) have shown that this form of sound practice can be successfully integrated as a method of relaxation, self-care, and the development of awareness about the harmful effects of noise. Findings from research study (Zećo, 2025) revealed that participants (one-third aged between 31 and 40) reported positive emotions such as relaxation (27.10%) and curiosity (26.49%) prior to the sound improvisation. After the active listening session, the feeling of relaxation increased to 49%, joy was reported by 13.90%, while confusion was 7.94%, fear 7.28%, and anxiety only 3.97%. After sound improvisation, participants no longer reported thoughts about daily obligations, nor feelings of fear, boredom, or distrust.

The workshop-based format, guided sound improvisation, and the synergy between two media-sound and image-created an additional dimension of interpersonal communication and emphasized the benefits of active listening. Students expressed themselves through abstract drawing while listening to sound improvisation. Artistic activity in response to auditory stimuli, without a given theme or visual subject, encouraged students to explore their inner world. An analysis of participants' drawings showed that nearly all were able to explore and connect with their internal experience through abstract drawing, letting go of figurative visual motives. Results from the analysis of drawings by participants from the three different faculties indicated a high prevalence of circular forms and linear circular patterns, regardless of the type or pressure of the pencil, marker, or chalk used on paper-forms that developed into abstract images under the influence of percussive sound vibrations (Zećo et al., 2023). By creating analogies between image and sound through analysis, comparison, evaluation, memory, and the development of sensory experience, students enhanced their associative abilities, aesthetic sensitivity, and a desire for independent exploration.

Conclusion

According to the World Economic Forum (2016), it is estimated that 65% of today's children will work in jobs that do not exist yet. Considering the rapid pace of global change in today's world, "constant adaptability, which implies the acquisition of a combination of skills that can be effectively applied in everyday life and the labour market, and continuously improved," is essential (OECD, 2018: 18). Contemporary literature offers multiple conceptualizations of the key skills required for life in the 21st century. Various terminologies are used to describe these skills, such as global competencies (OECD, 2018), transformative competencies (OECD, 2018), transferable competencies (Stefanidou & Skordoulis, 2012), and 21st-century skills (P21). The ability to solve complex problems, critical and creative thinking, are typically understood as overarching skills not tied to specific jobs, tasks, or environments, but rather as fundamental for success in today's labour market (Lucas & Venckute, 2020; OECD, 2018). Therefore, contemporary teaching must be original, creative, practical, student-centred, and involve diverse forms of learning. When students play an active role in the educational process, rigidity is avoided, and emphasis is placed on collaborative work, improvisation, and an individualized approach to knowledge acquisition.

Music education for future teachers should enable greater freedom and enjoyment in their work, as well as the strengthening of musical competencies, abilities, self-confidence, and genuine trust in one's own strength and creativity. Sound improvisation and the relatively simple technique of playing vibrational percussion instruments can serve as excellent methodological-didactic tools for spontaneous sound play, as well as for visual and literary expression. This study showed that sound improvisation has relaxation potential and could possibly be used as a means of relaxation in addition to psychosocial advisory work with students. It is important to emphasize that previous experience with music was not a decisive factor for students to perceive the workshops as positive and engaging, and no significant differences were found between students from the Faculty of Education and the Academy of Fine Arts. Through abstract drawing, students further explored the principle of active listening, simultaneously developing two forms of language — auditory and visual. In order for future teachers to stimulate children's imagination in visual arts classes, it is first important to allow students to experience the creative process themselves (Pivac, 2016). The role of the educator or facilitator of visual or musical activities must not be dominant. Rigidity, overly strict planning of activities, imposition, and an overemphasis on the final product over the process itself hinder children's creativity and often lead to the use of templates in their work (Duh, & Župančić, 2011).

The research showed that the collaborative process was motivating for students and that faculty educators should collaborate more, using joint projects to demonstrate the advantages of incorporating different media in teaching. It would be interesting to continue this research through a series of workshops using various visual art techniques, to actively involve students in the creation of spontaneous sound improvisations, or to compare

rhythmic imitation and improvisation. Limited by time constraints, curriculum demands, and a lack of resources, we often forget that only through experiential, creative, and stimulating workshops can we empower young people to develop critical thinking. Guided improvisation, through different media and resources, directs learners toward creative action and thinking — such as curiosity, striving for innovative solutions, and the ability to perceive both material and immaterial phenomena in unconventional ways — and should serve as a guiding principle in all forms of teaching.

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