International Journal of Environmental Sciences
ISSN: 2229-7359
Vol. 11 No. 23s, 2025
https://theaspd.com/index.php

The Effect of Sensitization on Students' Performing Practice as a Response on Listening Self-audio Recordings

Svetlana Karkina[1*], Liliya Mukhametzyanova[2], Gulnara Batyrshina[3]
[1]Didactics, organization and research methods, University of Salamanca, Salamanca, Spain Institute of Philology and Intercultural Communication, Kazan Federal University, Kazan, Russia. Svetlana_Karkina@usal.es
[2]Institute of Philology and Intercultural Communication, Kazan Federal University, Kazan, Russia. 2213407@mail.ru
[3]Institute of Philology and Intercultural Communication, Kazan Federal University, Kazan, Russia. 29.05.2014kfu@gmail.com

Abstract: *The presented work is motivated by the problem of psychological support of students' performing practice. This research is based on the theory of sensitization in perspectives of shaping human experience through exposure of sensory stimuli to neural networks. It intends to stimulate this psychological process by the means of listening by students the musical records prepared by themselves that will benefit their performing practice. The purpose of this study is to clarify how students' perception of music should be guiding their motor skills through listening to their self-audio records? The research questions relate to variables of students' engagement in the process of self-audio recordings. This research was conducted at Kazan Federal University, 64 students and 7 teachers as experts were involved. The methodology used questionnaire, related to making audio-records by students or not, times and way of listening, students' self-assessment of records. Teachers were asked to fill the criterion-referenced test for assessment of students' final performances. For evaluation the results were chosen quantitative (correlation analysis) statistical method. The experimental work confirmed positive correlation between listening of self-records and the quality of performances featured by psychological phenomena. The study contributes to educational practice by suggesting recommendations of listening positively many times enjoying music rather than criticize interpretation mistakes for improvement.*
Keywords: *Sensitization, Higher Education, Performing Practice, Self-audio Recordings, Students.*

1. INTRODUCTION

Performing practice is a crucial part of the professional higher education of prospective music teachers. In the frames of professional activity, a compulsory school music teacher needs playing musical instruments and singing by voice for demonstrating to disciples the variety of music culture. Regarding this purpose the performing practice takes central place in the music education curriculum at the university. The provision of the effectiveness of this process requires continuous efforts from the educators and approbation new methods and technical tools.

Psychological approach is significant instrument for educational practice. Through the understanding of hidden patterns of people's motivation, learning, personal development and interaction with the environment, educational psychology contributes to the learning process and supports flexibility of teachers' strategies and techniques. Consequently, the teaching methods developed on the basis of psychological knowledge provides valuable insights for the practice of professional training.

2. LITERATURE REVIEW

Recent studies demonstrate the relevance of the issue of sensitization in the field of psychological education. The researchers suggest different methods, including digital tools, for the implementation of sensitization in the educational practice. Some critical trends of the studying of sensitization for the purpose of music education need to be learnt in the theoretical frameworks of this research project.

2.1 Theoretical Framework of Sensitization

Sensitization is a fundamental psychological theory that explains the phenomenon of increased response to a repeated exposure of a stimulus over time [1]. In contradiction to habituation, which lead to decrease personal responsive to frequent irritant, the effect of sensitization activates attention of human's brain to repeated source as something that might be important [2].

Researchers state that despite the sensitization is very simple psychological process, it can play a critical role in shaping human's behaviors, emotional response [3] and being helpful with mental health [4]. According to recent studies, sensitization helps to different purposes from learning approach and formation of memory [5] to prevention of addictions and treatment of phobias [6].

The phenomenon of sensitization was broadly studied in the field of music. Scholars note the positive effect of the listening to music as a treatment of pain and stress in the daily life of patients who has various aliments or congenital syndromes [7]. Since the last decades music psychologists mentioned the significant role of sensitizing experiences of adolescent musicians in music performance practice for prevention of their anxiety [8]. Several studies noted the effect of engagement in music making for responses to painful stimulation [9] of individuals, who demonstrate differences of their mental abilities and physical health [10]. Regarding the music the authors emphasize the active approach of sensitization, which suggested as a basis of a circular model of artistic practice [11]. Consequently, from the psychological point of view music takes a valuable role for implementing sensitization and can be helpful in cases of human diseases and disorders.

2.2 Repetition in the Practice Sessions of Artist

The concept of repetition was widely studied in the psychology. Primarily, this term was known regarding the learning languages. Scholars stated the high-frequency marker words for assisting early grammatical categorization [12]. In the research of memory recognition were mentioned the benefits of testing and guessing after repetition of the cycle of study [13]. Researchers noted a strong correlation between repetition and retention of anatomical knowledge, while the type of repetition activity was less important [14]. Summarizing psychological studies, it is possible to state that repetition is a critical factor for learning success, because of support of memorizing more information.

Since last decades the psychological approach was implemented to musical study [15]. The method of repetition was suggested by music teachers as a powerful teaching tool [16], [17]. Through the experimental work was stated that the participants, who repeated musical tones several times demonstrated the higher speed of singing melody [18]. Scholars compared this effect with the same phenomenon in learning languages [18]. Additionally, the emotional response was indicated the repetition effect during the perception of musical structure [19]. According to another studies, the impact of involuntary musical imagery was noted as a stimulation by familiar songs, which were learned in the early childhood [20]. Margulis [21] in his works emphasizes the aesthetic response to repetition of music, that is unfamiliar to a person. Bradley [22] points out the role of repetition in the development of musical preferences. Scholars generally agree that repetitive exposure of music has valuable impact on subjective and physiological response due to the therapeutic purposes [23].

Moving further, Bernstein suggested the term for characteristic of the training process, which was called by him as “repetition without repetition” [24]. By this concept the scholar emphasizes the critical meaning of human perception for improving motor behavior, that also assume musical performing skills [24]. According to this theory the strong correlation between active students’ self-training and the quality of musical performance is featured by psychological phenomena. In these frameworks the issue of implementing for the repetitive practice in musical self-training process the technological tools need to be clarified.

2.3 Digital Tools for Training Musical Skills

In the recent studies researchers emphasized the significance of upgrading tools and teaching style for training musical performance skills remotely by the means of online interaction [25]. Since the pandemic period COVID-19 online technologies have been actively used in music education [26]. Teachers appreciated their benefits for delivering music lessons to remote communities [27] or providing education to rural classroom [28]. Scholars suggest implementation of digital technologies for learning music, including the purposes of creating music, performing practice and responding to music listening [29]. They note advantages of computer tools for implementing current pedagogical technologies, such as flipped classroom in music education [30]. Also, researchers demonstrate the benefits of online teaching music for promotion of relevant trends, like multicultural education through providing availability of diverse traditions of music making [31].

Generalizing recent studies, it can be stated the implementation of Internet resources in music education brings other vision of practical goals and new challenges [32]. Attractive dimension of online teaching music is collaborative practice of making compositions [33]. Modern technologies allow to develop musical competencies through creating students’ ensemble of making music by laptops [34], which provide the increasing of availability of music training for large amount of young generation. Scholars mention psychological benefits of this practice by the means of networking technologies for children’ ensemble music making [35]. Teachers through all over the world appreciate learning music in online groups for aspiring young musicians [36], building social constructivist framework [37], promoting innovative performing practice [38].

Without any doubts, digital technologies bring valuable opportunists to music education. They allow to upgrade teaching style, musical approach, pedagogical technologies in the classroom. Even in the past decades teachers noted individual experience phenomenon, when some persons became competitive musicians through the self-learning by the means of digital tools [39]. Despite the wide spreading of modern technologies in music education and their actively using in classroom nowadays, among the studies sources there were no found experience of implementing digital tools for repetitive performing practice.

Based on studied background reflected the relevant issues in the areas of phenomenon of sensitization, repetitive practice and digital technologies in music performing practice, the main purpose of this study was determined: to clarify how students' perception of music should be guiding their motor skills through listening to their self-audio records. According to the main purpose the research questions were identified:

1) Do the students' engagement in the process of self-audio recording benefits the quality of their music performing practice?
2) Which variables of students' engagement in self-audio recordings benefit more to their music performing?

3. MATERIALS AND METHODS

3.1 Samplings

To study the effectiveness of students' performing practice due to the listening of their self-audio records the experimental work was organized at Kazan Federal University. The study population comprised 64 undergraduate students (Table I), who was studying music education curriculum of 1-3 academic levels in full-part regime. Data were collected from one academic semester from March 10 to July 10, 2025.

Ethical clearance to carry out the experimental work was attained from Kazan Federal University policy the processing of personal data. Students were informed about the purpose of the study and were given the option not to be involved in the experiment. The survey was anonymized to protect the identities of the students [40].

The selected academic groups were studied at the music instrument class. Each of them is training one of the music instruments: piano, violin, guitar, flute, accordion, domra. According to the rules, after the academic semester they need to demonstrate two music pieces, were learnt with teacher' support.

Table 1: Samples characteristics

N	Curriculum	Academic level	Total number of students	Gender		Age
				M (%)	F (%)	
1	Music and foreign (English) language	1	23	1 (4.3)	22 (95.7)	18-22
2	Music and additional education	2	21	2 (9.5)	19 (90.5)	19-23
3	Music and foreign (English) language	3	20	4 (20)	16 (80)	19-25

3.2 Professors are Experts in Music Education

Students' musical performances were analyzed by professors, who are competent in music education, and have regular practice with students, which are studied on music education program (Table II). This table includes information about professors' gender, age, professional qualification (H-higher education, D-candidate or doctoral degree), years of teaching experience.

In total seven persons participated in the experiment. Among them was only one man and six persons are females. The majority of professors have a degree (5 persons 71.4%), so their qualification level is high enough for professional competency. Mostly they are teaching 10 years and more (6 persons 85.7%).

Table 2: Professors are experts in music education

N	Professional qualification (H or D)	General teaching experience (years)	Gender		Age
			M (%)	F (%)	
2	H	35	1 (14.2)	1 (14.2)	31-60
5	D	40	-	5 (71.4)	34-60

3.3 Research Instruments

For the study purposes the questionnaire was designed for assessment students' involvement in making self-audio records. The questionnaire is completed by five close-ended questions and was delivered by

google form. The questions NN 1 and 4 required yes/no answer, while other questions used Likert scale. The questions and methods of their assessment are presented in the Table III.

Table 3: Student's questionnaire

N	Question	Method of assessment
1	Have you done the self-audio record?	yes/no
2	How more times did you listen to them?	1 – 100
3	Was you satisfied of your record?	1 – 10
4	Did you criticize of your performance?	yes/no
5	What is your self-assessment of the final performance?	1 – 10

The close-ended questions were targeted to collect the information about frequency of the listening of the audio records by students, their satisfaction of them, as well as the satisfaction of the final performance.

For the assessment of students' performances by professors are experts in the music education, the criterion-referenced test was designed. This test includes two levels of music performance: technical and expression. The first level consists of two categories: sound, produced by a performer, and text, properly performed. The second level has also two categories: artistic effects, and artistic interpretation. The assessment was made by using 10-points Likert scale from weak to excellent.

3.4 Statistical Analysis

In order to answer two research questions, the relevant methods of statistical analysis were chosen.

To prove the data gathered by the criterion-referenced test of the assessment of students' performances the statistical methods of median, mean score and standard deviation were used for establishing the diversity between experts' responds. The data received by the means of students' questionnaire also were proved by the methods of median, mean score and standard deviation.

For study the normality of all the obtained data the test of Kolmogorov-Smirnov was used. As soon as the data were evaluated as doesn't follow the normal distribution the nonparametric Spearman's Rho was chosen to study the correlations between these data.

4. Results and their Analysis

4.1 Students' Engagement in Self-Audio Recordings

In the beginning of the academic semester students were instructed how to work with audio records in the music instrumental class. It was suggested to them making an audio recording on their own no earlier than 3-4 weeks before the exam. Approximately at this period they have enough training practice and demonstrate the ability to perform music pieces from the beginning to the end consistently, without stops and blunders. Then they should be listening their records as frequently, as it possible. Regarding the listening, students were informed, that the process needn't in special conditions, and they can be listening personally in the most comfortable for each of them way.

In the last week of the academic semester students were asked to complete the questionnaire related to making and listening audio-records. The obtained results are presented in the Table IV. For counting the data for the questions NN 1 and 4 "yes/no" the ranks were assigned: 1 for "yes" and 0 for "no". The total results were counted by the method of mean score for each line.

Table 4: Student's questionnaire

Acad. level	n	Stat.	Q1	Q2	Q3	Q4	Q5
			yes/no	1-100	1-10	yes/no	1-10
1	23	MSc	0.81	37.5	5.6	0	6.2
		Md	1	34	6	0.25	7
		StD	0.998	0.599	0.772	0.366	0.845
2	21	MSc	0.92	67.1	7.2	1	8.1
		Md	1	62	8	0.56	8
		StD	0.824	0.675	0.698	0.452	0.599
3	20	MSc	0.74	22.4	6.2	0	7.6
		Md	1	18	7	0.44	8
		StD	0.769	0.788	0.723	0.567	0.834
Total	64	MSc	0.82	42.21	6.3	0.3	7.3
		Md	1	38	7	0.41	7.6
		StD	0.863	0.687	0.731	0.461	0.759

The obtained results demonstrate the active engagement of students in the experimental work. The higher results were received in the students' group of 2nd academic level by both methods mean score and median. The greatest number of these students made the audio record (1), were listening to them most times (62) and were satisfied of the quality of the record (8) as well as of the final performance (8). However, the large number of students from this group were criticized their records during the listening (1). The analysis confirms that students from this academic group show curiosity to the educational process, they feel themselves confidently and eagerly seeking for the professional improvement.

The lowest results were received in the students' group of 3rd academic level. The mean score shows, a smaller number of students made audio records (0.74) and were listening to them (22.4). Despite, these students demonstrate more positive self-assessment in comparison with the 1st academic level group and were more satisfied of the quality of their records (7) and the final performance (8). At the same time, they did not criticize the records during the listening (0). Based on these results an assumption was made, senior students are less curious in educational process, despite they feel themselves confidently enough in the professional development.

The obtained results of the students from all three academic levels are presented in the Fig. 1 (Median). The visualization of the data in diagram allows to compare the results of each question between all groups. It seems to be necessary to note, there are no significant difference among them. This assumption is claimed by the data of standard deviation from the last table. All the results are very close to 1, that verifies the absence of the significance differences. Only the fact should be pointed, the variety of results received for the question N2 (the number of times of listening to the records). Accordingly, the values of standard deviations for all three groups are further from 1. This fact can be explained that there was large difference between the number of times of listening to the records by students. Some of them were actively engaged in the listening, while other followed this instruction less frequently.

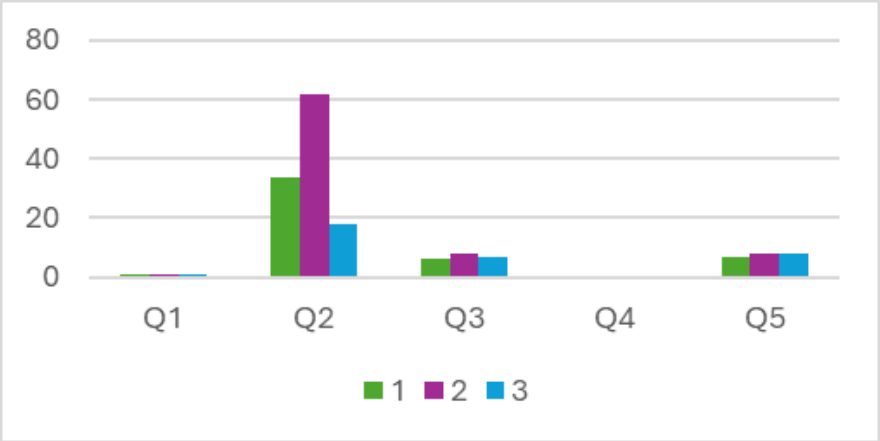

Fig. 1. Students' questionnaire (Median)

4.2 Assessment of Students' Performances by Professors

At the end of the academic semester during the final exam professors are experts in music education were evaluated students' performances. They were asked to complete the criterion-referenced test by giving assignments to criteria of technical and expressive level of each performance by the means of 10-points Likert scale. The mean score of the marks given by each professor was counted. The results of this test are presented in the Table V.

Table 5: Experts' evaluation

Acad. level	n	Stat.	Technical level		Expressiveness	
			Cr1	Cr2	Cr3	Cr4
1	23	MSc	7.6	6.5	8.1	5.4
		Md	7	6	8	5
		StD	0.798	0.898	0.672	0.765
2	21	MSc	8.1	7.8	8.5	6.7
		Md	8	7	8	7
		StD	0.724	0.885	0.788	0.982
3	20	MSc	7.7	7.6	8.6	7.8
		Md	8	7	8	8
		StD	0.862	0.922	0.817	0.778
Total	64	MSc	7.8	7.3	8.4	6.6

Acad. level	n	Stat.	Technical level		Expressiveness	
			Cr1	Cr2	Cr3	Cr4
		Md	7.6	6.6	8	6.6
		StD	0.794	0.901	0.759	0.841

The analysis of these results let us state, the quality of students' performances at the end of academic semester was high enough. Regarding the technical level, the hither result was noted in the group of 2nd academic level for the criterion of the produced sound (8.1) and properly performed artistic text (7.8). Students from this group demonstrate positive motivation to professional training and enthusiastic in study process. The lower results of technical level were mentioned in the 1st academic level group for both criteria: produced sound (7.6) and performed text (6.5). These students are at the beginner level of music education, that means they are less experienced and need more training practice for enhancing their professional competences.

The highest results of the second category expressiveness were observed in the 3rd academic level group. The presented performances were marked higher for both criteria: artistic effects (8.6) and artistic interpretation (7.8). These two criteria are indicating professional quality of a performance, and only mature musicians have ability to demonstrate their achievement. Among all three selected groups the students from the 3rd academic level are the older. That is the reason why they demonstrated higher results. The standard deviation for all the criteria is close to 1, what clarifies the consent of opinion among all the experts.

The obtained results of the experts' evaluation for all three groups are presented in the Fig. 2 (Median). By the means of diagram, the data were visualized for comparing them between each other. The similar results were noted for criteria NN 1 and 3 for all the groups. That means experts evaluated positively the sound and artistic effects in performing works. The criterion N 2 was evaluated lower in all groups, what correspond to real practice, which is featured by inaccuracies in artistic test as general. For the criterion N 4 there were more variety in results of three groups from lower in beginner to higher in senior level students respectively. These results totally correspond to the reality, because the artistic interpretation can be achieved by mature musician, and only senior students can demonstrate positive results due to their experienced.

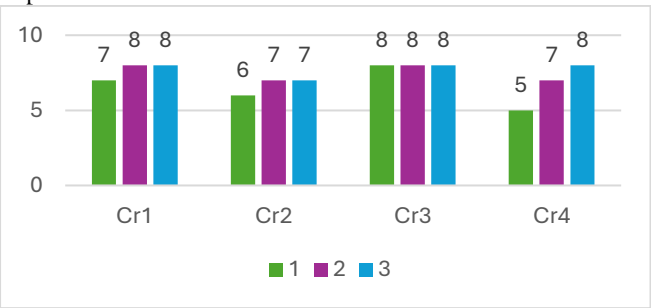

Fig. 2. Experts' evaluation of students' performances (Median)

4.3 Associations of Making Self-Audio Recordings with the Quality of Students' Performances

Targeting the answering two research questions determined in the research work the associations between students' engagement in the process of making by them self-audio records with the quality of their performances need to be studied. For this stage the non-parametric Spearman's Rho technique was chosen as the collected data were determined as not followed the normal distribution. The correlation procedure was used to establish if there is a correlation between each factor with others.

The purpose of the first step was to verify the associations between students' engagement in the process of making audio records and the quality of their musical performances at the final exam. For this reason, two variables were chosen: the mean score of students, who made audio record in each group, and the mean score of all four criteria results of performances evaluation in each group also. The data were compared for total cohort of 64 students from all three groups. The associations found and displayed in Table VI.

Table 6: Associations of students' engagement in making audio-records and experts' evaluation of their performances on the final exam

Making audio records	Expert's evaluation of performances (MSc)
	Total
Total	rs = 0.266

Key: rs ≥ p; 0.05=0.25, 0.01=0.33

The comparison of data of the number of students who made self-audio records with the experts' evaluation of their performances shows significant correlation, because the result is very close to p=0.05 (0.266>0.25). These results mean, that as frequently as students made self-audio records, they receive the higher scores for their musical performances evaluated by experts. The obtained results confirm, the students' engagement in the process of self-audio recording benefits the quality of their music performing practice of playing musical instruments.

4.4 Associations of the Quality of Students' Performances with the Variables of Practice with Self-Audio Records

For the answering the second research question the associations between variables of students' practice with self-audio recording and the quality of their performance works need to be investigated. Due to this purpose four factors from the questionnaire, in which students described their work with audio records, and the last one from criterion-referenced text as the summarizing of students' performing evaluation were selected. As in previous section, the non-parametric Spearman's Rho technique was chosen as the collected data were determined as not followed the normal distribution. The correlation procedure was used to establish if there is a correlation between each variable with the quality of students' performances. Also, the level of correlation needs to be clarified.

For the calculation four variables of students' work with audio records were gathered: frequency of listening records (1), satisfaction of these records (2), criticism of recordings (3), self-assessment of the final performance (4). Additionally, the data of experts' evaluation were chosen as the last factor. For the estimation the mean score of all the data was taken. The data were compared for total cohort of 64 students. The associations found and displayed in Table VII.

The comparison of the data of making audio records with the frequency of listening to them shows significant correlation, because the result is more than p=0.05 (0.326>0.25). This is obvious match: if students made recording, they were listening to records.

The next comparison of making records with satisfaction of them shows significant, but not so strong as in previous case correlation (0.251>0.25). This result demonstrates, satisfaction of self-performance motivates students to record themselves, and feel satisfaction again during the listening. The comparison of satisfaction of self-records with frequency of listening of them is higher, but close to the previous result (0.267>0.25): satisfied students like to listen to their records frequently.

The analysis of associations of the factor of making audio with the next three variables is predictable. Weak correlation was noted for the factor of critique (0.115<0.25): students critique themselves if they did not like their records, in such cases they did not make them usually. Instead, the correlation of making audio with self- and experts' assessment of the final performance is strong enough (0.321>0.25 and 0.266>0.25 respectively), what demonstrate the matching between these factors in general.

Table 7: Associations between variables of students' practice with audio records and experts' evaluation of their performances on the final exam

Factors	1	2	3	4	5	6
1						
2	rs = 0.326					
3	rs = 0.251	rs = 0.267				
4	rs = 0.115	rs = -0.189	rs = -0.167			
5	rs = 0.321	rs = 0.338	rs = 0.252	rs = -0.198		
6	rs = 0.266	rs = 0.328	rs = 0.289	rs = -0.179	rs = 0.255	

Key: 1) Making records, 2) Frequency of listening records, 3) Satisfaction of records, 4) Critique of records,

5) Self-assessment of final performance, 6) Experts' evaluation; rs ≥ p; 0.05=0.25, 0.01=0.33

More curious results were noted for the next correlations. So, the negative correlations were found between the factor of critique with the frequency and satisfaction of listening to audio records (-0.189<0.25 and -0.167<0.25 respectively). The assumption was made, that if a student criticized himself, he has not motivation to frequent listening and was not satisfied.

The same results were received for the correlation between factors of critique with self-assessment and experts' evaluation (-0.198<0.25 and -0.179<0.25 respectively). Despite traditional approach in music education promote critique as a valuable method of self-improvement [41], psychological approach let us

assume, unlimited criticism is less productive, while positive emotions during the perception bring more audible results [42].

The results of all the next correlations (between factors 5 and 6 with factors 2, 3 and 5 respectively) were also predictable, positive and strong enough. Mostly, the perception of competitive experts, and partially, students' self-perception of their performances positively correlated frequency of listening and satisfaction of records.

So, the obtained results are enough informative for answering the second research questions. Based on them it can be concluded, the most important factors of students' engagement in self-audio recording, which benefit more to their music performing practice are making audio records, frequency of listening to them, satisfaction and positive self-assessment of performance. At the same time, the factor of critique contradicts to all of them, even to the factor of experts' evaluation. Generalizing the results was concluded, that unlimited criticism is less productive, while positive emotions during the perception bring more audible results. This idea is confirmed by the recent psychological studies [42].

Generalizing the experimental work it can be conclude, the repetitive practice organized by the meaning of frequent listening to self-audio records, stimulates the mental process of sensitization, which leads to increasing the response to music through repeated exposure of a stimulus of music listening over time. Despite students did not were training with a musical instrument, they demonstrated better performance at the final exam. Phenomenon of sensitization was explained in psychology was confirmed in the presented study of music education and verified by the experimental data.

5. CONCLUSION

The training musical performing skills is a valuable element of music education. Implementation of psychological approach allows to enhance the effectiveness of this process. So, presented investigation was demonstrated, the concept of sensitization can be applied due to the purpose of enhancing musical performing skills. While this term was coined for the explanation of a psychological phenomenon, it can be applied due to the music education goals. Repetitive practice of listening self-audio records contributes to improvement of musical performing skills through the process of sensitization.

Following the research questions determined in the paper, based on the obtained data and analyzed results it was concluded:

- Students', are engaged in the process of self-audio recording, demonstrate high quality of music performance.
- The most important factors of students' engagement in the process of self-audio recording, which benefit more to their music performing practice are making audio records, frequency of listening to them, satisfaction and positive self-assessment of performance. The factor of critique contradicts to all of them, even to the factor of experts' evaluation.

Based on the research results and regarding the implementation the method of sensitization in the musical performing training practice, the recommendations can be suggested to listen with positive emotions the self-audio records as many times, as it is possible, to enjoy this music and less criticize the interpretation or mistakes, what will significantly benefit to improvement of performing competences.

REFERENCES

1. Peeke, H. (Ed.), "Habituation, sensitization, and behavior", Elsevier, 2012.
2. Coppola, G., Di Lorenzo, C., Schoenen, J., Pierelli, F. "Habituation and sensitization in primary headaches", The journal of headache and pain, vol. 14(1), p. 65, 2013.
3. Liu, Y., Noga, H., Allaire, C., Bedaiwy, M., Lee, C., Williams, C., Paul, Y. "Central sensitization and mental health outcomes of endometriosis patients during the COVID-19 pandemic", Journal of Obstetrics and Gynaecology Canada, vol. 45(5), p. 361, 2023.
4. Sharma, I. "Mental Health Care-Sensitization to Children's Needs", Journal of Indian Association for Child and Adolescent Mental Health, vol. 1(4), pp. 1-4, 2005.
5. Goldstone, R.I., Steyvers, M. "The sensitization and differentiation of dimensions during category learning", Journal of experimental psychology: General, vol. 130(1), p. 116, 2001.
6. Cautela, J.R. "Desensitization factors in the hypnotic treatment of phobias", The Journal of Psychology, vol. 64(2), pp. 277-288, 1966.
7. Linnemann, A., Kappert, M.B., Fischer, S., Doerr, J.M., Strahler, J., Nater, U.M. "The effects of music listening on pain and stress in the daily life of patients with fibromyalgia syndrome", Frontiers in human neuroscience, vol. 9, pp. 434, 2015.
8. Osborne, M.S., Kenny, D.T. "The role of sensitizing experiences in music performance anxiety in adolescent musicians", Psychology of Music, vol. 36(4), pp. 447–462, 2008.
9. Bradshaw, D.H., Chapman, C.R., Jacobson, R.C., Donaldson, G.W. "Effects of music engagement on responses to painful stimulation", The Clinical journal of pain, vol. 28(5), pp. 418-427, 2012.

10. Bradshaw, D.H., Donaldson, G.W., Jacobson, R.C., Nakamura, Y., Chapman, C.R. "Individual differences in the effects of music engagement on responses to painful stimulation", The journal of pain, vol. 12(12), pp. 1262-1273, 2011.
11. Kyriazakos, E.C. "Music and Environment: From Artistic Creation to the Environmental Sensitization and Action – A Circular Model", Open Journal for Studies in Arts, vol. 2(2), pp. 57-70, 2019.
12. Frost, R.L.A., Monaghan, P., Christiansen, M.H. "Mark my words: High frequency marker words impact early stages of language learning", Journal of Experimental Psychology: Learning Memory and Cognition, vol. 45(10), pp. 1883-1898, 2019.
13. Huff, M.J., Yates, T.J., Balota, D.A. "Evaluating the contributions of task expectancy in the testing and guessing benefits on recognition memory", Memory, vol. 26(8), pp. 1065-1083, 2018.
14. Kooloos, J.G.M., Bergman, E.M., Scheffers, M.A.G.P., Schepens-Franke, A.N., Vorstenbosch, M.A.T.M. "The effect of passive and active education methods applied in repetition activities on the retention of anatomical knowledge", Anatomical Sciences Education, vol. 13(4), pp. 458-466, 2020.
15. Huron, D. "A Psychological Approach to Musical Form: The Habituation-Fluency Theory of Repetition", Current Musicology, 2013.
16. Maynard, L.M. "The role of repetition in the practice sessions of artist teachers and their students", Bulletin of the Council for Research in Music Education, pp. 61-72, 2006.
17. Saville, K. "Strategies for Using Repetition as a Powerful Teaching Tool", Music Educators Journal, vol. 98(1), pp. 69-75, 2011.
18. Hutchins, S., Palmer, C. "Repetition priming in music", "Psychology of Popular Media Culture", vol. 1(S), pp. 69–88, 2011.
19. Livingstone, S.R., Palmer, C., Schubert, E. "Emotional response to musical repetition", Emotion, vol. 12(3), 552–567, 2012.
20. Byron, T.P., Fowles, L.C. "Repetition and recency increases involuntary musical imagery of previously unfamiliar songs", Psychology of Music, vol. 43(3), pp. 375-389, 2015.
21. Margulis, E.H. "Aesthetic Responses to Repetition in Unfamiliar Music", Empirical Studies of the Arts, vol. 31(1), 45-57, 2013.
22. Bradley, I.L. "Repetition as a Factor in the Development of Musical Preferences", Journal of Research in Music Education, vol. 19(3), 295-298, 1971.
23. Iwanaga, M., Ikeda, M., Iwaki, T. "The Effects of Repetitive Exposure to Music on Subjective and Physiological Responses", Journal of Music Therapy, vol. 33(3), pp. 219–230, 1996.
24. Ito, J. "Repetition Without Repetition: How Bernstein Illumines Motor Skill in Music Performance", Cognitive Systems Monographs, vol. 25, pp. 257-268, 2015.
25. Pike, P.D. "Improving music teaching and learning through online service: A case study of a synchronous online teaching internship", International Journal of Music Education, vol.35(1), pp. 107-117, 2017.
26. Karkina, S., Singh, B., Batyrshina, G., Nurgayanova, N. "Creating Multicultural Opportunities in Music Teacher Education: Sharing Diversity Through Online Competitions", Frontiers in Education, vol.7, is., art. №816121, 2022.
27. King, A., Prior, H., Waddington-Jones, C. "Connect resound: Using online technology to deliver music education to remote communities" Journal of Music, Technology and Education, vol. 12(2), pp. 201-217, 2019.
28. Johnson, D. C., Stanley, A. M. "A pilot project exploring rural classroom music teachers' perceptions and practices via an online professional development course", Journal of Music Teacher Education, vol. 30(3), pp. 99-114, 2021.
29. Bauer, W.I. "Music learning today: Digital pedagogy for creating, performing, and responding to music", New York, NY: Oxford University Press, USA, 2014.
30. NG, D.T.K., NG, E.H.L. and CHU, S.K.W. "Engaging students in creative music making with musical instrument application in an online flipped classroom", Education Information Technology, vol. 27, pp. 45–64, 2022.
31. Belz, M. J. "Opening the Doors to Diverse Traditions of Music Making: Multicultural Music Education at the University Level", Music Educators Journal, vol. 92(5), pp. 42–45, 2006.
32. Turchet, L., Fischione, C., Essl, G., Keller, D., Barthet, M. "Internet of Musical Things: Vision and Challenges", IEEE Access 2018, vol. 6, pp. 61994-62017, 2018.
33. Biasutti, M. "Strategies adopted during collaborative online music composition", International Journal of Music Education, vol. 36(3), pp. 473-490, 2018.
34. Cheng, L. "Musical competency development in a laptop ensemble", Research Studies in Music Education, vol. 41(1), pp. 117-131, 2019.
35. Hanrahan, F., Hughes, E., Banerjee, R., Eldridge, A. and Kiefer, C. "Psychological benefits of networking technologies in children's experience of ensemble music making", International Journal of Music Education, vol. 37(1), pp. 59-772019.
36. Zhang, M., Guo, M. and Xiao, B. "Creative thinking and musical collaboration: Promoting online learning groups for aspiring musicians", Thinking Skills and Creativity p. 42, 2021.
37. Lock, J., Johnson, C. "Playing together: Designing online music courses using a social constructivist framework", Pedagogy development for teaching online music, pp. 183-201, 2018.
38. Karkina, S., Faizrakhmanova, L., Kamalova, E., Akbarova, G., Kaur, B. "Performance Practice in a Pandemic: Training Ensemble Skills Using E-Tivities in Music Teacher Education", Frontiers in Education, vol.7, is. Art. №817310, 2022.
39. Price, D. "Open: How we'll work, live and teach from the inside out", London, England: Crux Publishing, 2013.
40. British Educational Research Association [BERA]. Ethical Guidelines for Educational Research, fourth edition, London, Available online: https://www.bera.ac.uk/researchers-resources/publications/ethicalguidelines-for-educational-research-2018 (accessed on 20/12/2023).
41. Thompson-Bell, J. "Student-centered strategies for higher music education: using peer-to-peer critique and practice as research methodologies to train conservatoire musicians", British Journal of Music Education, vol. 40(1), pp. 20-33, 2023.
42. Nissen, M. "The place of a positive critique in contemporary critical psychology. Outlines", Critical Practice Studies, vol. 10(1), pp. 49-66, 2008.