

MODERN VOCAL TECHNIQUES AS A TOOL FOR IMPROVING VOCAL AND VOCAL ENSEMBLE SKILLS OF ART EDUCATION STUDENTS

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SUMMARY. The study's relevance lies in the growing need to adapt the educational process in the field of vocal art to the challenges of the contemporary music scene, where vocalists' non-standard vocal techniques and methods in the performance process are becoming increasingly popular. The study aimed to investigate the influence of modern vocal techniques on the development of vocal and vocal ensemble skills of art education students, to determine their effectiveness in the educational process and to consider implementation methods in educational practice.

Methods: The study included expert evaluation, a comparative method for evaluating traditional and modern techniques, and an empirical basis: a questionnaire survey of students of music educational institutions. **Results:** The results of the study have shown that modern vocal techniques such as belting, twang, vocal fry, subtone, creaky voice, whistle register, ingressive phonation, multiphonics, sprechgesang, vocal distortion and yodelling contribute to expanding the performer's range, enhancing timbral expressiveness, and

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developing dynamic control. In addition, their use in a vocal ensemble helps to improve the balance of voices, form a harmonious sound and develop intonation coherence. The use of digital technologies in the learning process allows for an objective analysis of vocal parameters and increases the effectiveness of the training process. **Conclusions:** Modern vocal techniques are powerful tools for improving the vocal training of students in art education institutions. Their implementation in the educational process contributes to improving performance skills, expanding the expressive capabilities of the voice, and optimising ensemble sound. **Scientific novelty of the study:** The study's scientific novelty lies in its comprehensive analysis of the impact of modern vocal techniques - belting, twang, vocal fry, subtone, creaky voice, whistle register, ingressive phonation, multiphonics, sprechgesang, vocal distortion, and yodelling - on the formation of professional skills of students of art education institutions. **Prospects for future research:** Further research could aim to develop specialised methodological guidelines for teachers, adapt modern vocal techniques for different age groups, and analyse the effectiveness of digital tools in vocal teaching.

Keywords: pop vocals, vocal techniques, ensemble, ensemble performance, vocal pedagogy, vocal education.

Introduction

Modern vocal techniques significantly impact the development of students' vocal and vocal ensemble skills. They have become an essential tool for improving the technical and artistic aspects of performance in various styles of music. In particular, in the context of pop vocals, the latest techniques contribute to the development of unique expressive capabilities of the voice, increase the emotional impact of the performance, and improve the ensemble sound. However, modern vocal techniques are not limited to pop vocals - they are also used in academic singing, where they expand the range, improve sound control and intensify timbre expression.

Vocal and ensemble skills are an essential part of music education. In art education institutions, students acquire individual vocal skills and learn to work in a team and interact with other vocalists and instrumentalists, creating a harmonious sound. Modern vocal techniques can significantly improve the quality of ensemble performance, contributing to better intonation coherence, synchronicity, and dynamic balance in the group.

One of the main reasons modern vocal techniques' popularity is their ability to transform the voice, expanding the range and providing new opportunities for articulation and expression. Techniques such as belting, twang, vocal fry, subtone, creaky voice, whistle register, ingressive phonation,

multiphonics, sprechgesang, vocal distortion and yodelling allow singers to create a variety of effects that significantly enrich the sound palette of a performance. Not only do they help singers reach new heights in vocal expression, but they also help improve vocal technique by developing the ability to use voice power in a controlled manner.

These techniques are also crucial in academic vocal education, especially in training young singers and students who seek to combine traditional vocal methods with innovative ones. Using modern vocal techniques in the educational process allows for greater opportunities for solo and ensemble performances.

The study aimed to investigate the role of modern vocal techniques in the development of vocal and ensemble skills of art education students, as well as to analyze their impact on improving the effectiveness of the educational process in the field of vocal art. Empirical objectives of the study:

1. To analyze the influence of modern vocal techniques (belting, twang, vocal fry, subtone, creaky voice, whistle register, ingressive phonation, multiphonics, sprechgesang, vocal distortion and yodelling) on the technical and artistic components of vocal skills of students of art education institutions.

2. To evaluate the effectiveness of modern vocal techniques in developing vocal and ensemble skills, using the example of students who have ensemble and pop singing classes.

3. To trace changes in vocal expression, dynamics and breath control in students after introducing modern vocal techniques into the educational process.

Literature review

The effectiveness of the introduction of innovative technologies in the process of vocal training was studied by Wang⁶, who emphasized the importance of understanding the physiological aspects of vocal breathing, in particular the mechanisms of diaphragmatic control and regulation of airflow intensity. The same conclusions were made by Chukwu et al.⁷ The authors focused on the effect of diaphragmatic breathing exercises on respiratory

⁶ Wang, Yixuan. "The Effectiveness of Innovative Technologies to Manage Vocal Training: The Knowledge of Breathing Physiology and Conscious Control in Singing." In *Education and Information Technologies*, vol. 29, no. 6, 2024, pp. 7303–7319.
<https://doi.org/10.1007/s10639-023-12108-6>

⁷ Chukwu, Sylvester Caesar, Egbumike, Chukwuenyegom Joseph, Ojukwu, Chidiebele P., Uchenwoke, Chigozie, Igwe, Emeka S., Ativie, Nkechi R., ... & Uduonu, Ekezie M. "The Impact of Diaphragmatic Breathing Exercises on Respiratory Functions and Vocal Support in Otherwise Healthy Vocalists." In *Journal of Voice*, vol. 39, no. 2, 2022, pp. 37-44.
<https://doi.org/10.1016/j.jvoice.2022.09.025>

function and vocal support in vocalists, emphasizing that proper breathing is the basis of vocal art. Wasbotten⁸ also highlighted the importance of breathing.

The phenomenon of vocal art in the context of both historical and medical aspects of vocal activity was also studied by Hamdan et al.⁹ The central emphasis was on considering vocals not only as an artistic phenomenon, but also as a complex physiological and socio-cultural process closely intertwined with the functioning of the vocal apparatus. Their work by Leongómez et al.¹⁰ also emphasized the interdisciplinarity of vocal art. The authors hypothesized that musicianship is not only a socio-cultural phenomenon but also has a deep biological basis formed in the course of human evolution. Bannan et al.¹¹ drew the same conclusions, having researched the interdisciplinary origins of human vocal communication. The study emphasized the role of musical rhythm and intonation in building social interactions.

In their work, Pechennik et al.¹² explored the transformation of vocal art in the context of postmodernism as a socio-cultural phenomenon. They claimed that a modern vocalist is no longer limited to academic technique alone - the ability to create emotional resonance, flexibility in multi-genre interaction, and openness to stage experimentation are becoming more critical. Drozhzhina et al.¹³ also emphasized the importance of pop vocals for social communication and the development of modern society's cultural processes. The peculiarities of different vocal techniques were studied by Myhovych¹⁴, who underlined the need for a deeper physiological understanding of the vocal apparatus to safely master complex techniques such as belting,

⁸ Wasbotten, Lachman. *From Classical to Contemporary: The Evolution of Classical Vocal Pedagogy in the Modern Studio*, Doctoral dissertation, Arizona State University, 2022.

⁹ Hamdan, Abdul-Latif, Sataloff, Robert Thayer, & Hawkshaw, Mary J. "Vocal Art." *Civilization Features and Voice Disorders*, Cham: Springer International Publishing, 2022, pp. 181–187. https://doi.org/10.1007/978-3-031-15750-9_10

¹⁰ Leongómez, Juan David, Havlíček, Jan, & Roberts, S. Craig. "Musicality in Human Vocal Communication: An Evolutionary Perspective." In *Philosophical Transactions of the Royal Society B: Biological Sciences*, vol. 377, no. 1841, 2022, 20200391. <https://doi.org/10.1098/rstb.2020.0391>

¹¹ Bannan, Nicholas, Dunbar, Robin I. M., Harvey, Alan R., & Podlipniak, Piotr S. "Acoustic Processing and the Origin of Human Vocal Communication." In *Evolutionary Studies in Imaginative Culture*, vol. 8, no. 2, 2024, pp. 1006–1039. <http://dx.doi.org/10.70082/esiculture.vi.982>

¹² Pechennik, Mayia, Pryadko, Olena, Vozniuk, Oleksandr, Martyniuk, Liubov, Rudenko, Oleksandr, & Havrylenko, Yuliia. "Features of Vocal Art in the Context of Postmodernism as a Factor of Cultural Value." In *Postmodern Openings*, vol. 13, no. 4, 2022, pp. 56-68. <https://doi.org/10.18662/po/13.4/505>

¹³ Drozhzhina, Nataliya, Yeroshenko, Olena, Davydov, Serhii, Shchepakina, Vasyl, Breslavets, Halyna, & Osypenko, Viktoriia. "Estrade's Vocal Art in the Context of Integration into the Society of the Future." In *Postmodern Discoveries*, vol. 13, no. 4, 2022, pp. 1-13. <https://doi.org/10.18662/po/13.4/502>

¹⁴ Myhovych, Mykola. "Modern Vocal Techniques and Methods of Their Study." In *Art and Education*, vol. 55, no. 2, 2022. <https://doi.org/10.24919/2308-4863/55-2-13>

vocal fry, subtone, etc. Similarly, in their study, Paolillo et al.¹⁵ highlighted the phenomenon of vocal fry and its anatomical and physiological aspects.

In their work, Ildiz and İslim¹⁶ investigated the use of virtual reality technologies in vocal training. Liu and Zhou¹⁷ studied the effectiveness of applying innovative methods in vocal art to enhance the aesthetic expressiveness of performance. In his study, Shi¹⁸ emphasized the potential of mobile applications and online platforms to transform traditional approaches to vocal teaching, creating conditions for personalized, interactive and flexible learning. Cox¹⁹ conducted a comparative analysis of classical and modern commercial vocal pedagogies. In her work, Stephens²⁰ concluded that introducing contemporary vocal repertoire is necessary for academic singing pedagogy in the twenty-first century. The author substantiated the need to systematically include contemporary music in vocal training programmes and proved that familiarity with various modern styles stimulates innovative thinking in performers and increases their competitiveness.

An essential source for understanding new trends in vocal education, particularly for educators teaching popular singing, is the article by Hughes,²¹ in which he researched contemporary vocal art in popular music, particularly how the perception of artists and listeners affects the performance of vocal works in this genre. Hughes addressed various aspects of vocal skills in popular music genres, focusing on how cultural, social and individual factors determine the style and performance of songs.

¹⁵ Paolillo, Nico P., Carrozza, Luca, Osio, Maurizio, Rosa, Elisabetta, & Scalabrin, Matteo. "Inspiratory Vocal Fry: Anatomophysiological Aspects, Application in Speech Therapy, Vocal Pedagogy, and Singing. A Pilot Study." In *Journal of Voice*, vol. 35, no. 3, 2021, pp. 394–399. <https://doi.org/10.1016/j.jvoice.2019.10.004>

¹⁶ Yildiz, Doğanyigit Sati, & İslim, Omer Faruk. "Virtual Reality in Vocal Training: A Case Study from Practice." In *Research Studies in Music Education*, vol. 23, no. 3, 2021, pp. 391–401. <https://doi.org/10.1080/14613808.2021.1879035>

¹⁷ Liu, J. & Zhou, M. "The Role of Innovative Approaches in Aesthetic Vocal Performance." In *Música Hodie*, vol. 21, 2021. <https://doi.org/10.5216/mh.v21.69132>

¹⁸ Shi, Yaoyao. "The Use of Mobile Internet Platforms and Applications in Vocal Training: Synergy of Technological and Pedagogical Solutions." In *Interactive Learning Environments*, vol. 31, no. 6, 2021, pp. 3780–3791. <https://doi.org/10.1080/10494820.2021.1943456>

¹⁹ Cox, Megan Nicole. *A Comparative Study of Classical and Contemporary Commercial Vocal Pedagogies*. Thesis for the Degree of Master of Music in Research and Creative Work. Johannesburg: University of the Witwatersrand, 2021.

²⁰ Stephens, Jacqueline P. *The contemporary classical singer: why new music is necessary in 21st-century vocal pedagogy*: treatise submitted in partial fulfilment of the requirements for the Doctor of Musical Arts degree. Texas: The University of Texas, 2023. <https://doi.org/10.26153/tsw/47968>

²¹ Hughes, Diane. "Contemporary Vocal Artistry in Popular Culture Musics: Perceptions, Observations and Lived Experiences." *Teaching Singing in the 21st Century. Landscapes: the Arts, Aesthetics, and Education*, vol. 14, edited by Harrison, S., O'Bryan, J. Springer, Dordrecht, 2014, pp. 287–301. https://doi.org/10.1007/978-94-017-8851-9_17

Methods and materials

The research procedure

The first stage consisted of a preliminary diagnosis of the students' vocal skills using an expert assessment. At this stage, the basic level of mastery of such parameters as dynamic range, timbre expressiveness, breath control and intonation accuracy was determined. The expert committee included three vocal and ensemble teachers who independently assessed the students' performances before and after introducing the techniques. The criteria included: purity of intonation, breath control, articulation, timbre palette, dynamics, emotional expressiveness and ensemble coherence. The evaluation was based on a 10-point scale.

The second stage included the purposeful introduction of modern vocal techniques (belting, twang, vocal fry, subtone, creaky voice, whistle register, ingressive phonation, multiphonics, sprechgesang, vocal distortion and yodelling) into practical pop vocal and ensemble classes. Over 10 weeks, these techniques were systematically introduced into solo work and collective music-making (Table 1).

Table 1

Vocal technique	Description of the equipment	Effect on vocal abilities	Application results	Examples of exercises
Belting	The technique of powerful vocalization that utilizes the upper vocal range while maintaining a strong "bridge" to the chest voice	It helps develop a strong voice in the high tessitura of singing	The use of belting improves the energy and intensity of the voice in an ensemble performance	Sustaining long notes within the high range and engaging and releasing the chest voice exercises
Twang	A technique that produces a bright, sharp, but controlled sound, often used in folk singing	Enhances vocal resonance and tone quality, adding brightness and precise articulation	Affects the overall sound and confidence of ensemble singing, especially in rock or folk music	Performing short phrases with clear resonance, articulation exercises, and sound clarity drills
Vocal Fry	The technique involves using a low, raspy sound produced by firm compression of the	It achieves a rich, dramatic sound, especially in the lower vocal	Including vocal fry in the repertoire helps create a specific atmosphere in	Exercises for controlling low-pitched sounds, such as

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Vocal technique	Description of the equipment	Effect on vocal abilities	Application results	Examples of exercises
	vocal folds	range	music, such as in the pop or rock genres	pronouncing phrases using vocal fry to add dramatic effect
Subtone	A softer, quieter, duller sound often produces a muffled sound	Facilitates the transition between voices by adding contrast to the sound	Suitable for creating soft and gentle moments in music, especially in quiet vocal ensembles	Singing slow songs with soft, muffled notes exercises the ease of transition between voices
Whistle register	The highest register of the human voice is similar to that of a whistle	Expands the upper range, trains muscle control	Adds expressiveness and unique color to solo episodes	Gliding up to the highest notes, impulsive attacks in the whistle
Creaky voice	A special way of phonation with low air pressure, close to vocal fry, but with more precise articulation	It allows you to feel the initial movements of the vocal cords and work on sound density	Improves intonation control and lower register sonority	Slow reading of the text with a 'creak', combined with the usual manner of speech
Ingressive phonation	The type of sound production during inhalation	It develops breath control and allows you to diversify sound effects	It is used for spectacular introductions, especially in theatrical or avant-garde productions	Repetition of vowels during inhalation, exercises on soft inhalation with sound
Multiphonics	Simultaneous performance of several tones, especially typical for experimental vocals	It understands complex harmony and trains the vocal apparatus to produce atypical sounds	It strikes the listener with its unusualness and is used in contemporary works	Creating noise effects focusing on resonances, combining falsetto and laryngeal sounds

Vocal technique	Description of the equipment	Effect on vocal abilities	Application results	Examples of exercises
Sprechgesang	A semi-spoken singing style, between singing and speaking, often in avant-garde and dramatic works	Improves diction, trains the rhythmic sense	It helps to create a dramatic effect and diversify the ensemble's sound	Reading the text to a metronome, combining speech intonation with singing
Vocal distortion	A voice distortion technique is often used in rock and metal vocals	It develops strength, endurance, and vocal drive	It adds emotional intensity and is used in energetic fragments	Growling, fry-distortion, screaming voice inserts with breath control
Yodeling	Switching between chest and falsetto registers with a clear "flip"	Trains register control and coordination	It adds color and an element of surprise to folk and stage works	Exercises on register "flips" and "swings" between chest and head voice

Modern vocal techniques
Source: developed by the authors

The third stage consisted of surveying the study participants to identify the subjective performance experience gained and changes in vocal self-perception. It also involved conducting a repeated expert analysis of the students' vocal growth results. The survey included 10 closed questions with suggested answers.

The fourth stage is an expert assessment after an in-depth study of modern techniques.

The fifth stage included a statistical comparison of the indicators before and after introducing the techniques, analysis of the dynamics of changes in vocal technique and ensemble skills, and interpretation of the data in the context of the empirical tasks.

The sixth stage involved organising a series of open concert performances and ensemble shows. During these performances, students applied modern vocal techniques in the context of stage interaction, allowing them to explore performance results in a real concert space. The concerts were held at the Borys Grinchenko Kyiv Metropolitan University, Ukrainian National Tchaikovsky Academy of Music, Mykola Lysenko Lviv National Music Academy, Drohobych State Pedagogical University of Ivan Franko, and the Rivne State University of Humanities.

Methods

The expert evaluation was used to objectively determine the dynamics of the development of vocal technique and ensemble interaction of students before and after an in-depth course of studying modern vocal techniques. The questionnaire method allowed us to collect subjective data from students about changes in their perception of their vocals, confidence in technique, ability to self-control and expressiveness. Comparative analysis was used to identify changes in vocal training.

Sampling

The study involved 30 second- and fourth-year university students, with an average age of 20, who had previous experience mastering modern vocal techniques and those without such knowledge. This approach made it possible to ensure the results' representativeness and determine the impact of training at different levels. The selection of respondents was based on voluntary participation: all participants were familiar with the purpose, procedure and conditions of the study, gave their informed consent to participate, and had the opportunity to refuse to participate at any stage without any consequences.

The key criteria for inclusion in the sample were basic vocal training (at least 1 year of individual lessons), participation in the educational vocal ensemble process, and no medical contraindications to vocal workload.

The choice of this number of participants was determined by the need to ensure the comparability of the data between the results of the expert evaluation before and after the course of an in-depth study of modern techniques, as well as the feasibility of implementing the research procedure within the educational process. For the study, the participants were selected based on conditional homogeneity in age (19-21 years), voice type, and level of basic vocal skills. This method of selection allowed for the reduction of the influence of extraneous factors and the obtaining of reliable data for analysis.

Tools

Google Forms was used to conduct the survey. Video recordings of classes and rehearsals were used for on-site observation. Microsoft Excel was used to process empirical data, namely the survey results, and to implement a comparative analysis of the expert evaluation results before and after the in-depth study of modern vocal techniques.

Research results

Upon completion of the experimental implementation of modern vocal techniques in training future performers, a thorough quantitative and qualitative assessment of the changes that have taken place in students' vocal training was carried out. According to the expert evaluation of professional teachers, the average scores on a five-point scale are shown in Table 2.

Table 2

Vocal development parameter	Before the course	After the course	Change (+/-)
Dynamic range	2.9	3.8	+0.9
Timbre expressiveness	2.8	3.9	+1.1
Breath control	3.0	4.0	+1.0
Intonation accuracy	3.1	3.8	+0.7

Results of the expert evaluation before and after an in-depth study of modern vocal techniques

Source: developed by the authors

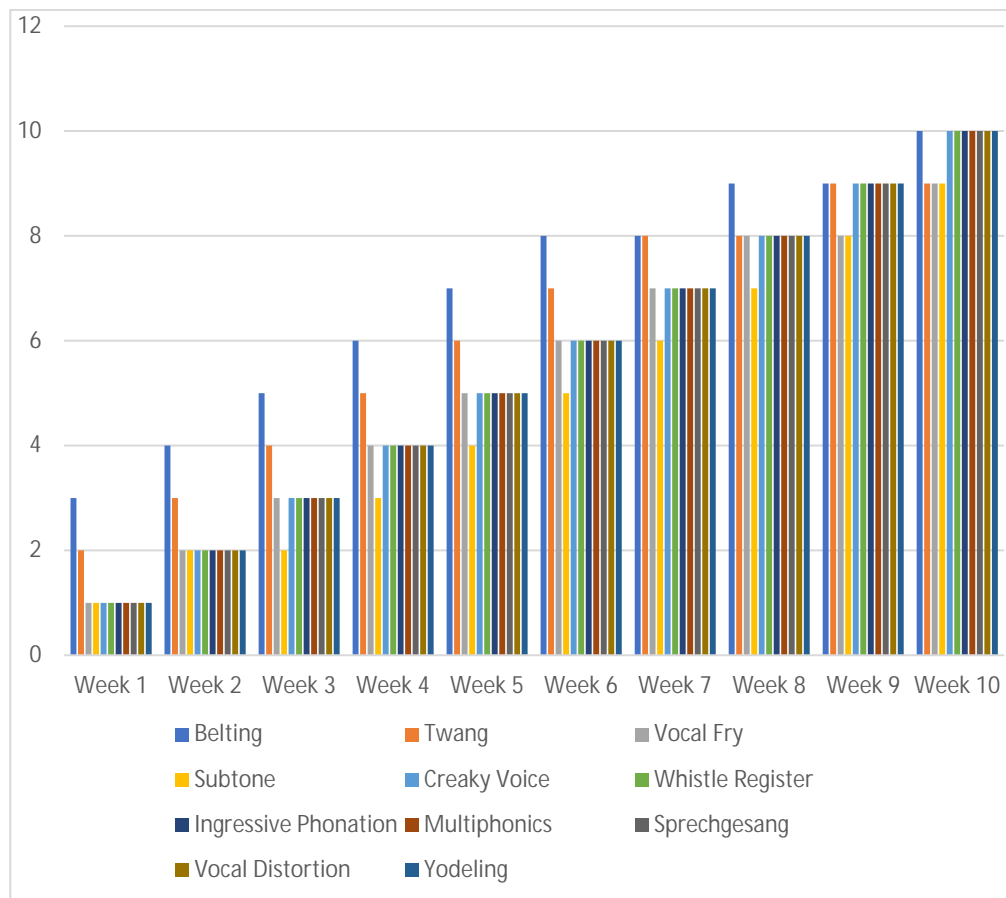
The analysis of the expert evaluation of students' vocal skills before and after the in-depth study of modern vocal techniques, presented in Table 2, shows a significant improvement in the key parameters of performance skills. The generalization of the data obtained on a five-point scale allowed us to identify both general trends in the participants' professional growth and the internal dynamics of the development of specific components of vocal technique.

The most significant increase was recorded in the area of timbre expression, with an average score of 2.8 before the course and 3.9 after it was completed. The subsequent highest increase was in breath control, which rose from 3.0 to 4.0, an increase of 1.0 points. The increase in intonation accuracy (from 3.1 to 3.8) is the smallest among all the presented indicators (+0.7 points). Ensemble coherence, which increased from 2.9 to 3.9, also significantly improved (+1.0). Dynamic range increased from 2.9 to 3.8 (0.9 points). As a result of this training, the performers can reproduce a broader range of dynamic levels and use them with greater musical logic and emotional expressiveness.

Figure 3 presents the dynamics of the development of four modern vocal techniques (belting, twang, vocal fry, subtone, creaky voice, whistle register, ingressive phonation, multiphonics, sprechgesang, vocal distortion,

yodelling) over 10 weeks of training. All the techniques show a gradual increase in the level of mastery, which confirms the effectiveness of their use in practical pop vocal lessons.

Figure 3



Modern vocal techniques and students' progress in each week of training
Source: developed by the authors

The analysis showed the most significant progress in the belting technique, where the skill level increased from 3 in the first week to 10 in the last. This technique, which requires the development of voice strength and control, presents the fastest learning pace. At the same time, the twang and subtone techniques gradually develop, reaching level 9 by the end of the study. Vocal fry also shows steady growth, gaining 9 points in week ten. Other

techniques, such as creaky voice, whistle register, ingressive phonation, multiphonics, sprechgesang, vocal distortion and yodelling, also show a gradual increase in difficulty, reaching high scores by week 10, indicating that they require prolonged training to master.

The survey results play a key role in identifying the qualitative changes that have taken place in the learning process. Generalizing the participants' responses made it possible to identify individual peculiarities of learning material and transformation of performance approaches. Thus, the survey results presented in Table 4 represent a multidimensional picture of the educational process's impact on the development of vocal skills.

Table 4

Question	Answers	Percentage (%)
1. How would you rate your general vocal level before taking the course?	1 (very low)	10%
	2 (low)	5%
	3 (average)	20%
	4 (satisfactory)	35%
	5 (very high)	30%
2. How would you rate your vocal level after completing the course?	1 (very low)	0%
	2 (low)	5%
	3 (average)	10%
	4 (satisfactory)	40%
	5 (very high)	45%
3. Have you experienced any improvement in your breath control while singing?	Yes, it is significant	50%
	Yes, moderately	35%
	Minor	15%
	No, I did not feel any changes	0%
4. How would you rate the changes in your timbre range after completing the course?	Significantly expanded	30%
	Moderately expanded	45%
	No changes	15%
	Decreased	10%
5. Did you find it easier to work in an ensemble after completing the course?	Yes, it is much easier	40%
	Yes, a little easier	45%
	I did not feel any changes	15%

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Question	Answers	Percentage (%)
	It has become more complicated	0%
6. How much do you think your intonation accuracy has improved?	Significantly improved	35%
	Moderately improved	45%
	No changes	20%
	Deteriorated	0%
7. Did your perception of your vocal abilities change after taking the course?	Yes, towards a significant expansion	25%
	Yes, towards a moderate expansion	50%
	No, it hasn't changed	20%
	Changed negatively	5%
8. Do you feel an emotional and psychological increase in confidence in your voice?	Yes, I feel much more confident	30%
	Yes, somewhat more confidently	50%
	No changes	20%
	I feel less confident	0%
9. How effective were the modern vocal techniques used during the course for you?	Very effective	50%
	Moderately effective	35%
	Weakly effective	10%
	They were not effective	5%
10. Is it appropriate to continue with the methods proposed during the course?	Yes, definitely	55%
	Perhaps to some extent	35%
	Not sure	10%
	No, I do not consider it appropriate	0%
	They were not effective	5%

Results of the student survey
Source: developed by the authors

Analyzing the survey results among the study participants on the impact of an in-depth study of modern vocal techniques allowed us to trace changes in vocal self-perception and the effect of the methods used during the study. First, attention should be paid to the changes in the self-perception of the study participants' vocal abilities, which were assessed using closed

questions. The questions about the overall vocal level before and after the course (questions 1 and 2) show a positive change among the respondents. Before the course, most participants rated their vocal level as average or above average, with 35% of participants choosing a score of 4 (average) and 30% indicating that their level was very high. After the course, however, 45% of the participants stated that their vocal level had improved significantly (score 5), and 40% chose a score of 4, indicating a significant increase in vocal ability. This result confirms the effectiveness of the course, the methods used, and the considerable role of training in strengthening vocal techniques.

Regarding the question about breath control (question 3), half of the participants reported that they felt a significant improvement in their breath control while singing. 35% reported a moderate improvement, while 15% reported a slight change. This result indicates that breath control is one of the main techniques in vocal performance, and most participants experienced a significant improvement in this aspect.

The question about the timbre range (question 4) shows various results: 30% of the participants reported that their timbre range had expanded significantly, another 45% reported a moderate expansion, and 15% did not notice any changes. The difference in results may indicate individual differences in perception and ability to develop specific vocal characteristics, but the overall result is positive.

Regarding the ease of working in an ensemble (question 5), 85% of the participants indicated that it became easier for them, with 40% saying it was much easier and 45% saying it was a little easier. The result suggests that participants improved their technical abilities after the course and became more coherent in group performances. Only 15% of the participants felt there were no changes in their ensemble work, indicating a positive effect of the course.

Intonation accuracy, an essential aspect of vocal technique, improved for most participants (question 6). 35% of participants reported a significant improvement, another 45% reported a moderate improvement, and only 20% felt no change. These answers confirm that modern vocal techniques have significantly improved the participants' ability to produce accurate intonation.

The question about changes in perceptions of their vocal abilities (question 7) also showed positive results. 25% of the participants reported that their perception of their abilities had changed significantly, and 50% shifted toward a moderate expansion. Only 20% felt no change in this aspect, which indicates a considerable positive impact of the course on the participants' self-perception.

Regarding emotional and psychological growth and confidence in their voice (question 8), 30% of participants felt much more confident after the course, and 50% felt somewhat more confident. Only 20% felt no change in confidence, confirming the positive impact on the participants' emotional state. This result indicates that mastering modern vocal techniques contributes not only to technical but also to psychological growth.

Regarding the vocal techniques' effectiveness (question 9), 50% of the participants found them very effective, 35% found them moderately compelling, 10% found them slightly effective, and only 5% indicated they were ineffective. This result confirms the high level of acceptance of the techniques among the participants, most of whom found them valuable and practical.

Finally, the question about the feasibility of continuing to study the methods proposed during the course (question 10) received positive responses. 55% of the participants believe they will continue to work with these methods, and 35% think they may do so to some extent. These answers again emphasize the course's high level of appreciation among the participants and their desire to continue working in this area.

During the implementation of the sixth stage of the study (a series of concerts), several significant trends were identified that demonstrated the effectiveness of modern vocal techniques in ensemble singing. The experiment involved students who prepared concert programmes as part of an in-depth study of contemporary vocal methods (Table 5).

Table 5

Vocal technique	Expected impact on the performer	Actual results in concert activity
Belting	Enhanced dynamic range, energy, powerful/assertive delivery	Noticeably increased stage expressiveness: listeners remarked on the power of climaxes; performers demonstrated better control over loud phrases
Twang	Bright, sonorous sound; improved resonance balance	The participants could more easily achieve purity of the upper notes; the ensemble began to sound harmoniously, with expressive articulation
Vocal Fry	Deepening the emotional palette, creating a "broken", intimate atmosphere	In a concert context, the technique was used sparingly but appropriately – it evoked a strong emotional response from the audience in solo episodes

Vocal technique	Expected impact on the performer	Actual results in concert activity
Subtone	Softening of timbre, intimacy, and airy phrasing	Providing a warmer, more intimate sound in the ensemble is particularly effective in the introductions and conclusions of pieces.
Creaky Voice	Adding textural depth to the sound is an intriguing effect.	It was used in expressive fragments to add emotional tension, especially in dramatic scenes.
Whistle Register	Melodious high notes; ability to play ultra-high tones	The technique added spectacular moments to solo performances, showcasing the performers' high vocal range
Ingressive Phonation	A unique technique for expression, creating an unusual sound	It was used rarely, but added drama to moments requiring extravagance and a deep emotional response
Multiphonics	Multiple sounds simultaneously; create innovative effects	The technique has found its application in avant-garde performances, impressing listeners with its novelty and experimental performance
Sprechgesang	Concurrence of language and music; creation of unique rhythmic expressiveness	It was used to create a tense atmosphere in productions where conveying the text through music is essential.
Vocal Distortion	Aggressiveness of sound; expressiveness, creating a "rough" sound	From time to time, it was used to add drama to transitional moments, enhancing the emotional tension in songs
Yodeling	Vocal transitions between registers; exceptional voice dynamics	The technique has become an accent in folklore or specific genre performances, adding uniqueness to the performers' sound

The ratio of expected and achieved effect when using vocal techniques
Source: developed by the authors

One of the most striking trends is a tangible increase in performing freedom. This process manifested itself in the ability of performers to be flexible in their interpretation and to interpret musical material more boldly,

especially in ensemble performances. After purposeful study of techniques such as belting, twang, vocal fry, subtone, creaky voice, whistle register, ingressive phonation, multiphonics, sprechgesang, vocal distortion and yodeling, students began to operate more consciously with the timbre palette, moving from one manner to another within a single piece or phrase without losing ensemble unity.

In particular, the subtone technique allowed expanding the dynamic range of the lower register. Meanwhile, belting and twang, which involve the concentration of sound with a bright timbre color, increased the expressiveness of the upper register. Creaky voice added textural depth and emotional tension. Whistle register expanded the range of high notes, and ingressive phonation provided unusual, expressive effects in specific moments. Sprechgesang improved the rhythmic expressiveness, and vocal distortion enhanced the drama, particularly in transitional moments. Yodelling added unique vocal transitions between registers, accentuating the folklore character of the performance. All these changes were accompanied by increased performance confidence and decreased stage fright, recorded during the concert performances and in the participants' questionnaires.

Another significant achievement was the improvement of the balance between the performer's individuality and the ensemble sound. Modern techniques have enabled each student to show their timbre coloring without disturbing the harmony of the ensemble sound. For example, in vocal ensembles performing modern arrangements of folk songs or pieces with jazz elements, a significant improvement in articulatory coherence between the parts was observed. In practice, the performance acquired greater textural clarity, realization of intonational accuracy and timbre saturation. The timbral palette of the ensembles became richer, and the overall sound more expressive, contrasting, and dynamic, which contributed to the development of "ensemble hearing" - the ability of each member to attune to the collective sound in real time.

Stage interaction between performers has also undergone qualitative changes. Within the concert block of the experiment, an increase in emotional interaction between ensemble members was recorded. Compared to the initial performances, the final concerts were characterized by better eye contact and coordination of tempo changes. In addition, while performing, the participants used body language, gestures, and facial expressions more actively as part of the performance interpretation, which improved the quality of the stage presentation and emphasized the artistic integrity of the performances.

Discussion

This study found that traditional vocal techniques used in educational institutions often need to be updated or integrated with elements of modern techniques. Similar conclusions were reached by Duan²² in his study, where he explored the prospects of using virtual and augmented reality in the process of teaching vocals. The same conclusions were made by Breslavets et al.²³ The authors studied the impact of new technologies on the vocal teaching process. Cox²⁴ studied both traditional and innovative teaching approaches and concluded that modern approaches to commercial singing are more flexible and focused on the individual needs of each student. Suryati²⁵ also emphasized the importance of using modern vocal techniques.

In her study, Sear²⁶ proved that traditional academic training often does not cover the specifics of genre stylistics, techniques and vocal strategies necessary for teaching pop and rock vocals. The study used an analysis of curricula, in-depth interviews with teachers, and evaluation of the educational outcomes of courses aimed at pop vocalists. The author has proposed a framework for a potential curriculum that considers both vocal physiological aspects and psychological and pedagogical components. Sear's work is valuable in the context of training pop singers and pop vocal teachers because the study showed that as a result of integrating a course of in-depth studying of modern vocal techniques, students significantly improved the following indicators: dynamic range, timbre expressiveness, breath control, and intonation accuracy.

The study emphasized that modern vocal techniques are relevant and must be actively integrated into the educational process, as traditional performance techniques focus more on academic vocals. The significant difference between scholarly and pop vocals was emphasized in the work of

²² Duan, Li. "The Application of Modern Virtual Reality Technology in the Teaching of Vocal Music." In *Curriculum and Teaching Methodology*, vol. 6, no. 19, 2023, pp. 77-81. <https://doi.org/10.23977/curtm.2023.061912>

²³ Breslavets, Halyna, Shpak, Halyna, Khomenko, Alla, Bakalo, Lydmyla, Osypenko, Viktoriia, & Dziuba, Oleg. "Distance Vocal Training in the Postmodern Period." In *Revista Românească Pentru Educație Multidimensională*, vol. 15, no. 2, 2023, pp. 440-455. <https://doi.org/10.18662/rrem/15.2/743>

²⁴ Cox, Megan Nicole. *A Comparative Study of Classical and Contemporary Commercial Vocal Pedagogies*. Thesis for the Degree of Master of Music in Research and Creative Work. Johannesburg: University of the Witwatersrand, 2021.

²⁵ Suryati, S. "The Use of Growl Vocal Technique to Enhance Voice Quality in Pop Song Performance." *Jurnal Seni Musik*, vol. 24, no. 2, 2023, pp. 123-135.

²⁶ Sear, Joanna. "Modern Vocal Pedagogy: Investigating a Potential Curricular Framework for Training Popular Music Singing Teachers." In *Journal of Popular Music Education*, vol. 8, no. 1, 2024, pp. 239-254. https://doi.org/10.1386/jpme_00105_1

Frič and Podzimekova²⁷. The authors focused on comparing sound emission between classical and pop singers. They investigated how differences in singing techniques affect the intensity and quality of sound waves generated by the vocal cords of classical and pop singers. Similarly, in their work, Keskinen and Juntunen²⁸ emphasized that traditional approaches to vocal training do not always meet the needs of pop singers. In his work, Cobb²⁹ explored how traditional vocal training methods can be adapted to the modern requirements of the stage. However, conventional vocal training methods are not always relevant in contemporary performance. Similarly, Oliveira et al.³⁰ emphasized the importance of the right approach to vocal training.

The students' survey results showed that the in-depth study of modern vocal techniques significantly influenced the students' professionalism indicators. If we compare this study with works that reveal the pedagogical process in China, in particular, Xia³¹ considered the unique features of Chinese vocal art in the context of multiculturalism. Zhang and Hu³² analyzed the role of the Chinese language in developing popular singing. Hu³³ studied the difference between vocal techniques used in Chinese pop music and traditional music. Li³⁴ studied the stages of formation of Chinese vocal music over a century. Yin³⁵ investigated contemporary pop music, considering its socio-cultural

²⁷ Frič, Marek, & Podzimekova, Iva. "Comparison of Sound Emission between Classical and Pop Singers." In *Biomedical Signal Processing and Control*, vol. 66, 2021, 102426. <https://doi.org/10.1016/j.bspc.2021.102426>

²⁸ Keskinen, Katri A., & Juntunen, Marja-Leena. "Perspectives on Popular Music Voice Teaching: A Systematic Review of Contemporary Literature." In *Journal of Popular Music Education*, vol. 8, no. 2, 2024, pp. 135–155. https://doi.org/10.1386/jpme_00139_1

²⁹ Cobb, Clarkia. "Vocal Pedagogy with the Contemporary Commercial Music (CCM) Singer." In *WWU Graduate School Collection*, 2022, 1101. <https://cedar.www.edu/wwuet/1101>

³⁰ Oliveira, Priscilla, Ribeiro, Vanessa Veis, Florencio, David Sildes Fidelis F., Palhano, Manoel, Gonsalves, Rayana Rodrigues, & do Nascimento, Maiara Alves. "Vocal Training in Healthy Individuals: A Review of Volume." In *The Journal of Voice*, vol. 38, no. 5, 2024, pp. 11-23. <https://doi.org/10.1016/j.jvoice.2022.03.004>

³¹ Xia, Weitao. "Peculiarities of Singing in Chinese Popular and Traditional Music: Influence of Musical Genres on Vocals." In *Música Hodie*, vol. 22, 2023. <https://doi.org/10.5216/mh.v22.73226>

³² Zhang, Liu, Hu, Jaong. "Retraction Note: Pop Music Singing in Education with Modern Innovative Technologies: How the Chinese Language Shapes the Creation of Popular Singing." In *Journal of Psycholinguistic Research*, vol. 54, no. 13, 2025. <https://doi.org/10.1007/s10936-025-10130-y>

³³ Hu, M. "Features of Singing in Chinese Pop and Traditional Music: The Influence of the Music Genre on Vocal Music." *Dossier China*, vol. 22, 2022. <https://doi.org/10.5216/mh.v22.73137>

³⁴ Li, Yanfeng. "The Formation and Future Direction of Chinese Vocal Music in 100 Years of Development History." In *Pakistan Journal of Life and Social Sciences*, vol. 22, no. 1, 2024, pp. 1062-1072. <https://doi.org/10.57239/PJLSS-2024-22.1.0076>

³⁵ Yin, Li. *Knowing Pop Music* (Master's thesis). Berklee College of Music, 2021. <https://remix.berklee.edu/graduate-studies-contemporary-performance/204>

aspects. In contemporary vocal education, these studies confirm the importance of integrating modern vocal techniques, allowing students to gain a broader perspective on vocal art.

Limitations

This study's limitations were the small sample size and individual differences in students' perception and mastery of vocal techniques, which may reduce the standardization of the data obtained.

Recommendations

To ensure greater representativeness of the results, it is recommended that the sample of study participants be expanded by involving more educational institutions and students from different levels of training. In addition, modern vocal techniques should be integrated into the curriculum, which will allow students to acquire comprehensive skills and improve their skills in vocal art and ensemble performance.

Conclusions

The study examined modern vocal techniques to improve vocal and vocal ensemble skills of art education students. The results showed that integrating modern vocal techniques into the educational process significantly enhances students' vocal and performance skills. After implementing an in-depth analysis of contemporary vocal techniques, the study confirmed a significant improvement in students' vocal skills. According to the results of the expert evaluation, the main parameters of performance skills, in particular, timbre expressiveness, breath control and dynamic range, were improved. The most significant improvement in students' vocal skills was observed in timbre expression, an essential aspect of individualizing a performance style. Changes in intonation accuracy and ensemble coherence also confirm the positive impact of the in-depth study of modern techniques on the development of vocal and ensemble interaction skills.

The survey results among the participants showed that most students felt a significant improvement in breath control and timbre range, which are essential components of vocal skills. 50% of respondents said they had experienced a significant improvement in breathing, and 45% in the timbre range. In addition, most participants noted an increase in confidence in their vocal abilities, confirming the emotional and psychological growth that contributed to the overall voice development. This indicates the effectiveness of modern vocal techniques in shaping students' professional skills.

The study proved that the introduction of modern vocal techniques into the educational process positively impacts the development of vocal skills, increases the level of vocal self-perception, strengthens the technical aspects of performance and promotes the professional growth of future performers.

The study's scientific novelty lies in its focus on the specific use of modern vocal techniques in the context of vocal education for students of art education, which allows us to expand our understanding of their role in the development of musicians.

The study's practical value lies in the fact that the results obtained allow for the improvement of curricula, in particular in the context of the use of modern vocal techniques, which contributes to the development of pop music.

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