

Using immersive learning in teaching dance composition to develop student creative autonomy

O uso da aprendizagem imersiva no ensino da composição em dança para desenvolver a autonomia criativa dos alunos

El uso del aprendizaje inmersivo en la enseñanza de la composición de danza para desarrollar la autonomía creativa de los alumnos

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Abstract: *The educational transformations of the 21st century, linked to the digitization of learning and active implementation of innovative pedagogical technologies, are driving the search for new approaches to learning. The study aims to explore the possibilities of using immersive learning in the process of teaching dance composition and its impact on the development of student creative autonomy. Two groups of students (control and experimental) participated in the study, who were taught using different educational approaches: traditional methods and immersive learning. As a result of the experimental training, a significant increase of creative autonomy in the experimental group was recorded. The overall level of creative competence increased by approximately 41% (from an average of 3.15 to 4.45), while in the control group, the increase was about 16% (from 3.05 to 3.55). The most significant changes were observed in experimental skills (about 47%) and to independently create dance composition (about 44%), which indicates the effectiveness of using immersive learning in fostering creative autonomy among choreography students. The results confirmed the effectiveness of immersive learning in teaching dance composition, as evidenced by a significant increase in creative autonomy in the experimental group compared to the control group.*

Keywords: *Creative potential. Ukrainian folk dance. Classical ballet. Ballroom dance. Virtual reality.*

Resumo: As transformações educacionais do século XXI, ligadas à digitalização da aprendizagem e à implementação ativa de tecnologias pedagógicas inovadoras, impulsionam a busca por novas abordagens de ensino. Este estudo teve como objetivo explorar as possibilidades de utilização da aprendizagem imersiva no processo de ensino da composição coreográfica e seu impacto no desenvolvimento da autonomia criativa dos alunos. Dois grupos de alunos (controle e experimental) participaram do estudo, sendo ensinados por meio de diferentes abordagens pedagógicas: métodos tradicionais e aprendizagem imersiva. Como resultado do treinamento experimental, observou-se um aumento significativo da autonomia criativa no grupo experimental. O nível geral de competência criativa aumentou em aproximadamente 41% (de uma média de 3,15

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para 4,45), enquanto no grupo controle o aumento foi de cerca de 16% (de 3,05 para 3,55). As mudanças mais significativas foram observadas nas habilidades experimentais (cerca de 47%) e na criação independente de composições coreográficas (cerca de 44%), o que indica a eficácia da aprendizagem imersiva no fomento da autonomia criativa entre estudantes de coreografia. Os resultados confirmaram a eficácia da aprendizagem imersiva no ensino da composição de dança, como evidenciado por um aumento significativo na autonomia criativa no grupo experimental em comparação com o grupo de controle.

Palavras-chave: Balé clássico. Dança folclórica Ucraniana. Dança de salão. Potencial criativo. Realidade virtual.

Resumen: Las transformaciones educativas del siglo XXI, vinculadas a la digitalización del aprendizaje y la implementación activa de tecnologías pedagógicas innovadoras, impulsan la búsqueda de nuevos enfoques de aprendizaje. Este estudio explora las posibilidades del aprendizaje inmersivo en la enseñanza de la composición de danza y su impacto en el desarrollo de la autonomía creativa del alumnado. Dos grupos de estudiantes (control y experimental) participaron en el estudio, a quienes se les impartieron clases mediante diferentes enfoques educativos: métodos tradicionales y aprendizaje inmersivo. Como resultado de la formación experimental, se registró un aumento significativo de la autonomía creativa en el grupo experimental. El nivel general de competencia creativa aumentó aproximadamente un 41 % (de un promedio de 3,15 a 4,45), mientras que en el grupo control el aumento fue de alrededor del 16 % (de 3,05 a 3,55). Los cambios más significativos se observaron en las habilidades experimentales (alrededor del 47 %) y en la creación independiente de composiciones de danza (alrededor del 44 %), lo que demuestra la eficacia del aprendizaje inmersivo para fomentar la autonomía creativa entre los estudiantes de coreografía. Los resultados confirmaron la eficacia del aprendizaje inmersivo en la enseñanza de la composición de danza, como lo demuestra un aumento significativo de la autonomía creativa en el grupo experimental en comparación con el grupo de control.

Palabras clave: Potencial creativo. Danza folclórica Ucraniana. Ballet clásico. Baile de salón. Realidad virtual.

1 INTRODUCTION

Research in the field of arts education increasingly emphasizes the importance of fostering students' creative autonomy as one of the key competencies of future professionals. In the context of dance education, creative autonomy is viewed as students' ability to independently generate, combine and interpret movements, creating original compositions based on acquired technical and artistic skills. The issue of developing student creative autonomy and independence in education attracts the attention of contemporary researchers. In particular, Lin et al. (2025) demonstrated that the use of the Creative Dance methodology contributes to a statistically significant increase in student autonomy. Similar conclusions are drawn by Yu (2024), who emphasized that educational methods of dance education, based on the principles of self-determination theory, contribute to the development of autonomy, creative thinking and personal growth among students. Within the scope of this study, creative autonomy is viewed as an integral characteristic of the professional development of a future choreographer, formed

through students' active interaction with the contemporary educational environment. The study of dance composition involves developing the ability to independently create an artistic image, experiment with movement and autonomous decision-making. In this context, immersive learning is viewed as a promising tool for expanding boundaries of traditional learning.

Classical ballet as an academic system of dance education is characterized by a high degree of standardization in its movement, a clear structure of positions and coordination, which determines the specific nature of the development of performer's creative autonomy. Unlike improvisation-oriented genres, in classical ballet, creativity manifests itself in the individualized interpretation. The issue of fostering creative autonomy takes on particular significance in the context of classical ballet, which is based on a codified system of movements, positions and coordination. As noted in contemporary research on ballet pedagogy, traditional approaches focus on technical perfection, whereas modern ones emphasize the development of creativity, individuality and holistic development of performers (Yang, 2025). Thus, the creative autonomy of future

choreographers manifests itself in the varied interpretation of dance movement, while preserving stylistic integrity and classical ballet techniques.

Contemporary research in arts education reveals a growing interest in the use of digital and immersive technologies in education. Among the most common are virtual reality (VR) and augmented reality (AR) technologies, motion analysis systems, artificial intelligence (AI) tools and machine learning algorithms, which are gradually being integrated into creative disciplines. Researchers note that the application of these technologies creates an interactive learning environment, increases student engagement and promotes students' cognitive and creative activities (Hutson & Olsen, 2022; Zhou, 2026; Wang, 2024). In particular, immersive learning simulates spatial and kinematic movement structures, which is especially important in dance education and other performing arts.

Studies on dance education emphasize that the use of AR and VR can facilitate a better understanding of the structure of dance combinations, body position and movement dynamics, as well as increase student learning motivation (Zhou, 2026; Wang, 2024). Other studies demonstrate the potential of AI and machine learning technologies in analyzing movement, enhancing learning and fostering students' creative skills (Zhang, 2025; Cecotti et al., 2024). However, alongside the advantages of using digital technologies, researchers also highlight certain limitations, particularly the need for specialized technical equipment, complexity of integrating technologies into traditional pedagogical methods and insufficient development of didactic models for their application in arts education (Samala, et al., 2025).

The use of innovative technologies is also being actively researched in other educational fields; in particular, Geisen et al. (2023) examined the application of VR as an innovative teaching tool in sports education. In his dissertation, Limapornvanitr (2024) investigated the application of mixed reality (MR) in studio-based architecture education, focusing on the development of creative problem-solving. The

author emphasized that MR stimulates student creativity by allowing them to experiment with design in a safe and interactive space, reducing the fear of making mistakes and promoting the development of innovative thinking. In their work, Wang and Li (2024) noted that the integration of technology into education significantly enhances the effectiveness of pre-service teachers, allowing them to simulate complex pedagogical situations and practice teaching strategies in a safe, controlled environment.

Despite the significant body of research on the use of immersive technologies in arts education, the question of their impact on the development of creative autonomy of future choreographers remains understudied. In particular, contemporary academic literature lacks empirical studies that combine the use of immersive learning with the assessment of student creative autonomy during the process of learning choreography. It is precisely this research gap that makes this study relevant.

The aim of this study is to test the effectiveness of immersive learning in choreography in order to develop student creative autonomy. Research objectives:

1. To analyze contemporary approaches on the use of immersive technologies in arts and dance education.
2. To develop a model for immersive learning integration into choreography teaching.
3. To experimentally assess the impact of immersive learning on students' level of creative autonomy, their ability to make autonomous decisions on dance composition and their ability to experiment with movement.

2 LITERATURE REVIEW

Research in the field of arts education over the past five years has increasingly focused on the role of innovative technologies, particularly immersive learning, in fostering student creative autonomy.

Dou et al. (2021) examined the relationship between the development of creative thinking and innovative thinking in teaching dance composition. The authors noted that creativity in choreography manifests itself

through the ability to generate new movement ideas, while innovative thinking allows these ideas to be transformed into a coherent composition that aligns with the artistic vision. In turn, the importance of developing creative autonomy in students was emphasized by Hsia et al. (2021), who suggested that creating conditions for the independent search of artistry contributes to the formation of individual style and enhances the effectiveness of learning in creative disciplines. Thus, modern digital and immersive technologies are viewed as a promising tool for supporting creativity, as they expand opportunities for experimentation with movement, space and dance composition.

In contemporary scholarly discourse, classical ballet is viewed as a system operating at the intersection of tradition and innovation. Some studies emphasize the need to preserve the technical foundation of classical ballet while integrating contemporary pedagogical approaches aimed at developing student creative autonomy (Winslow, 2025). However, there is an observed trend toward the transformation of the pedagogical paradigm: from more directive models of instruction to student-centered approaches (Cartwright, 2025).

In his study, Wang (2025) examined the use of AR technologies to create personalized immersive learning for dance education. The primary focus was on how interactive AR interfaces adapt educational content to students' individual skill levels and learning pace. The author proposed a model that uses machine learning algorithms to analyze students' individual progress. Based on the data obtained, the system adjusts the complexity of tasks, offers individual recommendations and generates personalized learning. Guang and Xueliang (2025) also emphasized that immersive technologies facilitate a deeper emotional and cultural immersion in folk dance traditions.

The importance of using innovative technologies in arts education, particularly in dance education, was highlighted by the following authors. Li (2025) concluded that the use of VR significantly increases learning effec-

tiveness. Similarly, in his work, Xia (2025) emphasized how the use of digital technologies expands access to dance education, especially in international context, where students can engage with educational programs from different countries and cultural traditions. Xu et al. (2023) found that the use of an AR-based system significantly enhances learning effectiveness. Liu and Shi (2025) emphasized that the integration of new media, particularly multimedia platforms, video technologies, digital archives, online courses and interactive learning, significantly expands didactic resources available in dance education.

Similarly, Zhu and Gee (2025) investigated the impact of technological innovations on teaching classical ballet, specifically the use of digital tools in professional training. One of the conclusions was that integrating innovations into dance education results in curricula adaptation to contemporary educational needs. Zhang (2024) investigated the impact of AI technologies on the management system and organization of education in the field of teaching choreography in higher education. The main focus was on how AI technologies optimize learning and modernize traditional teaching approaches. Li and Ahmad (2025) conducted a comprehensive literature review on the development and current trends in online dance education. The authors emphasized that the effectiveness of online learning depends on the integration of VR, AR and motion analytics technologies, allowing to simulate live training sessions and track students' progress.

The analysis of academic sources has shown that the use of virtual, augmented and mixed reality in dance education stimulates the creative process and develops individual compositional skills. However, the issue of systematically integrating these technologies (virtual, augmented and mixed reality) with traditional methods of teaching dance composition remains understudied. The results of this study can be applied in teaching dance composition to create interactive learning environment that stimulates student creativity and fosters their autonomy.

3 METHODS AND MATERIALS

The study was conducted during the 2024–2025 academic year at higher arts education institutions in Ukraine with students majoring in Choreography (specialization: Ukrainian folk dance, classical ballet and ballroom dance). The total duration of the experiment was 8 weeks. The study involved 40 students aged 18 to 22 who were in their second- or third- year of the bachelor's program. Women predominated among the participants, which corresponds to the typical gender ratio in choreography majors (30% of men, 70% of women). The participants represented various areas of study, particularly Ukrainian folk dance, classical ballet and ballroom dance.

The sample was selected using stratified random sampling, considering the program year and level of prior training. The inclusion criteria were: majoring in Choreography, ages 18–22, regular attendance at practical classes in dance composition and signed written consent to voluntarily participate in the study. Exclusion criteria included missing more than 20% of classes during the experimental period or refusing to participate at any stage of the study. Participants were randomly assigned to two groups of 20 people each: an experimental group and a control group.

The experimental group trained using immersive learning, while the control group followed traditional choreography teaching methods. Immersive learning incorporated the use of virtual reality (VR) technologies, augmented reality (AR) elements, interactive video materials and digital visualizations of composition. VR was used to model the stage space and visualize various options of choreographic forms, allowing students to experiment with movement and promoting the development of structural cohesion. AR was used to overlay digital models of movements and trajectories onto the actual studio space, which helped students better understand choreographic forms and encouraged independent exploration of dance compositions. Interactive videos were used to analyze and compare different choreography options, which fostered

the development of originality and experimental skills. Practical sessions in both groups were held twice a week and lasted 90 minutes. In total, 16 sessions were held during the experiment. The curriculum included tasks for creating short choreography, improvisation, rhythmic characteristics and movement patterns. In the experimental group, some of these tasks were performed using digital visualization and virtual movement.

The tasks were adapted to the specific nature of classical ballet and involved creating short sequences (*enchaînement*) based on classical training elements (*adagio*, *allegro*), as well as variations in choreographic patterns and forms. This approach aligns with contemporary trends in ballet pedagogy, which emphasize the integration of technical training with the development of cognitive and creative skills. Particular attention was paid to preserve the principles of classical technique (*aplomb*, *turnout*, *coordination*), ensuring a balance between academic form and innovative education.

The research procedure consisted of three stages. At the first stage, an initial assessment of students' level of creative autonomy was conducted. This involved questionnaires, observations and expert evaluation of performed dance compositions. The questionnaire consisted of 12 questions aimed at identifying students' level of confidence in their own creativity, their experience with improvisation, their readiness to experiment with movement and their attitude toward creating choreography independently. Structurally, the questionnaire included three sections: (1) self-assessment of creative confidence and autonomy in dance composition, (2) experience using improvisation and experiment with movement, (3) attitudes toward the use of digital and immersive technologies in learning. Responses were rated on a five-point Likert scale (1- strongly disagree; 5- strongly agree). The internal consistency of the questionnaire was calculated with Cronbach's α of 0.84, which indicates a sufficient level of reliability. The survey was conducted by the course instructor before the experiment. Expert evaluation was performed by three instructors of choreographic disciplines with at least 10 years of experience in teaching and choreogra-

phy. The evaluation was conducted using a scale developed by authors, which included criteria such as originality, creative autonomy, structural cohesion and experimental skills. Structured observations involved recording students' activity while performing tasks on dance composition, specifically their initiative to make decisions, ability to improvise and level of autonomy while creating choreography.

The second stage involved conducting the experiment, during which the experimental group worked using immersive technologies, while the control group used traditional methods. During the classes, students' performances of their choreography were recorded on video for subsequent analysis of the creative process.

At the third stage, a final evaluation of the experiment's results was conducted, specifically assessing students' level of creative autonomy as demonstrated in their dance composition tasks. The following indicators were evaluated: originality, creative autonomy, structured cohesion and experimental skills. The evaluation was conducted by five experts: choreography instructors with over 10 years of teaching experience who specialize in various dance genres: Ukrainian folk, classical dance and ballroom dance. To enhance objectivity, the evaluation results were averaged. The level of student creative autonomy was determined using a pedagogical author-developed evaluation scale for expert evaluation, created for the purposes of this study based on the approaches presented in the current research on creativity in arts education. The scale involved evaluating four key parameters: originality, structural cohesion, creative independence and experimental skills. Each criterion was evaluated on a five-point scale (1 - low level, 5 - high level of creative autonomy).

The final score was calculated as the means received across all criteria. To enhance the reliability of the evaluation results, an expert assessment method was employed, in which several choreography specialists independently analyzed students' work, after which the means were calculated. To verify the reliability of the expert evaluation, the consistency of the scores among the experts was analyzed. For

this purpose, the individual scores (assigned by each expert according to the specified criteria) were compared, after which a consistency index was calculated. The results demonstrated an adequate level of inter-expert reliability in the assessment, which allowed the use of the average expert scores as a generalized indicator of student creative autonomy.

Additionally, brief semi-structured interviews were conducted with students in the experimental group after the experiment. The interview included five open-ended questions regarding their experience working with immersive technologies, difficulties encountered while performing tasks and their perception of their own creative autonomy.

The dynamics of the development of student creative autonomy were determined by comparing the average values of indicators at the initial and final stages of the experiment using the authors' assessment scale. The scale included the following indicators: originality, creative autonomy, structural cohesion and experimental skills. For each participant, the means for these criteria were calculated, and the effect size (the difference between the final and initial scores) and the mean difference within a single group were determined.

Statistical analysis of the results was performed using descriptive statistics (means and standard deviations). To test the statistical significance of changes within each group, paired t-test was used, while two-sample t-test was used to compare results between the experimental and control groups after the experiment.

4 RESULTS

Data analysis was conducted by comparing the indicators of the control and experimental groups at the initial and final stages of the study. The main focus was on the dynamics of the development of student creative autonomy observed through their ability to independently create dance composition, originality, structural coherence and experimental skills.

At the initial stage of the experiment, an assessment of students' initial level of creative autonomy was conducted (Table 1).

Table 1 – Initial level of student creative autonomy at the beginning of the experiment

Indicators	Control group (n=20), M ± SD	Experimental group (n=20), M ± SD	p
Originality	3.1 ± 0.52	3.2 ± 0.48	0.61
Creative autonomy	3.0 ± 0.49	3,1 ± 0,46	0.58
Structural cohesion	3.2 ± 0.55	3.3 ± 0.50	0.64
Experimental skills	2.9 ± 0.51	3.0 ± 0.47	0.59
Overall mean score	3.05 ± 0.43	3.15 ± 0.41	0.57

Note: M — means; SD — standard deviation; p — level of statistical significance (two-sample t-test).

Source: Developed by the authors (2026).

The analysis of the results from the initial assessment showed that most students had an average level of creative skills. Indicators of originality, creative autonomy, structural cohesion and experimental skills were at approximately the same level in both groups. The overall indicator of creative autonomy was 3.05 ± 0.43 in the control group and 3.15 ± 0.41 in the experimental group; no statistically significant differences were found between the groups ($p = 0.57$), indicating the homogeneity of the sample prior to the experiment.

Structured observations showed that the use of immersive learning contributed to an increase in students' engagement in creative activities. The experimental group demonstrated greater initiative in performing tasks, willingness to experiment with various types

of movement and they proposed their own dance compositions more actively. A key characteristic was the increased interest in creating choreography, which manifested in a greater number of creative ideas, a bigger variety of movement combinations and greater autonomy in dance composition.

Although the control group also demonstrated some progress in the development of creative skills, the changes were less pronounced compared to the experimental group. Most participants continued to rely on the examples provided by instructors and were less likely to demonstrate autonomy in seeking new dance compositions.

The final stage of the study involved a reassessment of the student level of creative autonomy (Table 2).

Table 2 – Final indicators of student creative autonomy after the experiment

Indicators	Control group (n=20), M ± SD	Experimental group (n=20), M ± SD	p
Originality	3.6 ± 0.50	4.4 ± 0.41	<0.01
Creative autonomy	3.5 ± 0.47	4.5 ± 0.39	<0.01
Structural cohesion	3.7 ± 0.48	4.3 ± 0.42	<0.01
Experimental skills	3.4 ± 0.46	4.6 ± 0.37	<0.001
Overall mean score	3.55 ± 0.38	4.45 ± 0.35	<0.001

Note: M — means; SD — standard deviation; p — level of statistical significance (two-sample t-test).

Source: Developed by the authors (2026).

Data analysis after the experiment revealed a positive trend in the development of creative competencies among students in both groups; however, the experimental group demonstrated significantly higher scores. Specifically, the average score for originality in the control group was 3.6 ± 0.50 , while it was 4.4 ± 0.41 in the experimental group ($p < 0.01$). The average level of creative autonomy increased to 3.5 ± 0.47 in the control group and to 4.5 ± 0.39 in the experimental group ($p < 0.01$). The structural cohesion reached 3.7 ± 0.48 in the control group and 4.3 ± 0.42 in the experimental group ($p < 0.01$). Regarding experimental

skills, the control group scored 3.4 ± 0.46 , while the experimental group scored 4.6 ± 0.37 ($p < 0.001$). The overall average score for creative autonomy was 3.55 ± 0.38 in the control group and 4.45 ± 0.35 in the experimental group ($p < 0.001$), confirming the statistically significant effect of using immersive learning on the development of student creative autonomy. The data indicate that the integration of VR, AR and interactive videos stimulates independent search of dance composition, increases originality and contributes to the formation of a more holistic artistic image of dance compositions (Table 3).

Table 3 – Development of student creative autonomy during the experiment

Indicators	Control group ($\Delta M \pm SD$)	Experimental group ($\Delta M \pm SD$)	p
Originality	0.5 ± 0.30	1.2 ± 0.35	<0.01
Creative autonomy	0.5 ± 0.28	1.4 ± 0.37	<0.001
Structural cohesion	0.5 ± 0.31	1.0 ± 0.34	<0.01
Experimental skills	0.5 ± 0.29	1.6 ± 0.38	<0.001
Effect size	0.5 ± 0.27	1.3 ± 0.33	<0.001

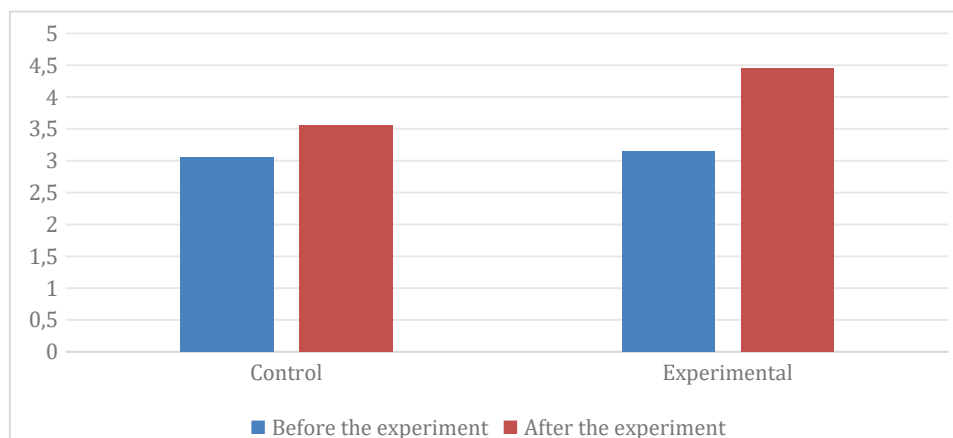
Note: ΔM = mean score difference from initial to final stages of the experiment, M — means; SD — standard deviation; p — level of statistical significance (two-sample t-test).

Source: Developed by the authors (2026).

Another important result was an increase in the level of awareness of the creative process. Experimental skills showed the greatest increase (+1.6 in the experimental group), with students clearly explaining their decisions on dance composition, demonstrating their abil-

ity to analyze their own creativity and reflect on artistic means. During discussions on the completed tasks, they more frequently drew attention to the connection of movements, musical accompaniment, choreographic forms and emotional expressiveness (Figure 4).

Figure 1 – Control and experimental groups comparison, %



Source: Developed by the authors (2026).

A comparative analysis of the final results of the control and experimental groups confirmed the effectiveness of using immersive learning in teaching dance composition, particularly for classical ballet, Ukrainian folk dance and ballroom dance. The data indicate that the integration of digital and interactive technologies into learning creates favorable conditions to develop student creativity and stimulates autonomous thinking. Immersive learning expands the boundaries of traditional learning, giving students an opportunity to delve deeper in creating dance compositions and to experiment with various artistic means.

The results confirm that the use of immersive learning in teaching dance composition is an effective pedagogical tool for fostering student creative autonomy. Its application contributes to the development of creative thinking and independence in decision-making and to the improvement of learning in arts education. The results also indicate that further implementation of immersive technologies in the training of future choreographers may expand the possibilities of contemporary pedagogical practice.

5 DISCUSSION

The results of this study demonstrate that the use of immersive learning has a positive impact on the development of student creative autonomy in the process of learning dance composition. A comparative analysis of the results of the control and experimental groups showed the effectiveness of using immersive technologies in teaching dance composition. Their integration into learning contributes to the development of students' independence, experimental skills and individual artistic style. The overall average score for creative autonomy was 3.55 ± 0.38 in the control group and 4.45 ± 0.35 in the experimental group ($p < 0.001$). In their study, Badaruddin et al. (2023) examined the use of digital technologies in teaching dance composition within a choreography program in Indonesia. The study was based on an analysis of two case studies, highlighting how technological tools can be

integrated into learning to develop students' creative and compositional skills. The authors also concluded that new technologies stimulate students' creative exploration and generally have a positive impact on learning.

Similarly, Rubio-Tamayo et al. (2025) emphasized the importance of using immersive learning. The authors noted that 3D video (volumetric video) significantly expands the traditional capacities for dance recording, as it provides a full three-dimensional reproduction of movement that can be viewed from various angles and in an interactive environment. Consequently, due to the immersive nature of 3D content, students can explore choreographic forms in greater detail, analyze performance techniques and study complex movement combinations. Zhang (2023) studied the transformation of dance education under the influence of AI technologies. The main conclusion was that the integration of AI into dance education allows for a radical change in teaching approach, making it more personalized and adaptive to students' needs. This conclusion aligns with the findings of this study, thus confirming that technology is a vital element of 21st-century arts education.

The results of the experiment also showed that immersive learning deepens the artistic aspect of learning, particularly for the specializations of classical ballet, Ukrainian folk dance and ballroom dance. Students in the experimental group demonstrated a more pronounced understanding of the relationship between movement, musical accompaniment and stage space, which positively influenced the integrity of the dancer compositions. During the course of work, the experimental group sought to develop an individual choreographic style more frequently, experimented with various choreographic forms and strove to create a more cohesive artistic image. A number of studies on competitive dance or general digital methods reached identical conclusions. In particular, Xu (2026) investigated how VR technologies improve teaching of sports dance. The author emphasized that the integration of VR increases student motivation, as it makes learning more engaging and immersive. The

results of the experiment also showed that immersive learning contributes to the development of students' artistry. Additionally, Qu (2023) concluded that digital motion capture methods facilitate a more detailed analysis of plasticity and rhythmic characteristics, as well as documentation and reproduction of dance routine. Furthermore, the study by Zhang and Wu (2025) emphasized how mastering basic programming skills and creating digital content allows students to experiment with visual and kinetic forms, which significantly expands opportunities for self-expression and the development of their own artistic style. A similar trend was observed in this study, where students in the experimental group demonstrated greater engagement in creative tasks and a more active desire to autonomously create dance compositions.

The findings confirm the notion that contemporary ballet pedagogy is undergoing a transformation, with innovative technologies complementing classical traditions. As noted in the studies, effective classical ballet instruction involves combining classical technique with the development of reflective thinking and individual interpretation (Zeller, 2017).

This allows us to view immersive technologies as a tool for deepening academic training, rather than as an alternative to traditional methods. Thus, the results indicate that the integration of immersive technologies into classical ballet does not contradict its canonical nature; on the contrary, it expands the possibilities of pedagogical interaction, allowing to combine traditional principles with individualized learning trajectories.

Within the classical ballet system, immersive technologies can be viewed as an effective way of developing creative autonomy, which does not contradict the canons of established tradition but rather facilitates their deeper assimilation. This approach aligns with contemporary trends in ballet education focused on integrating traditional and innovative pedagogical practices (Yang, 2025) and is linked to the development of plasticity as an integral characteristic of the professional training of future choreographers.

At the same time, the findings of this study can be compared with the critical observations presented in the work by Zhu (2025), in which the author analyzed both the advantages and limitations of VR technologies in dance education. In particular, the researcher notes that VR is not always capable of fully conveying the nuances of movement, emotional expression and dance interpretation, which are important artistic components. A comparison of the obtained results with contemporary scientific approaches in the field of arts education makes it possible to conclude that the integration of digital technologies into the teaching of creative disciplines brings new opportunities for the development of students' creative potential. Immersive learning expands the boundaries of traditional learning and creates conditions for active student engagement with artistic material. Thus, technology does not replace traditional pedagogical methods but complements them.

LIMITATIONS

The sample was limited to 40 students from a single educational institution, which limits the ability to generalize the results to all arts institutions and contexts. It should also be noted that the assessment of students' creative skills was conducted by a panel of expert instructors, which may introduce a subjective component, although standardized evaluation criteria were used.

6 CONCLUSION

The study confirmed the effectiveness of using immersive learning in teaching dance composition to foster student creative autonomy. A comparative analysis showed that the experimental group, which worked with virtual and augmented reality technologies, had a significant increase in creative competencies: the overall average score increased from 3.15 to 4.45, exceeding the increase in the control group (from 3.05 to 3.55). Specifically, the ability to independently create dance compositions increased by 1.4 points, originality - by

1.2 points, experimental skills - by 1.6 points and structural cohesion - by 1.0 points.

The results indicate that the use of immersive technologies creates conditions for a more active and autonomous creative process among students and stimulates autonomous decision-making. Immersive learning contributes to a deeper understanding of artistry of dance composition, including expressiveness of movement, choreographic forms and stage image. The study confirmed that the integration of immersive technologies into learning is an effective tool for improving the quality of artistic training and developing creative autonomy of choreography students. The results of the experiment demonstrate the practical value of introducing VR, AR and mixed reality into arts education.

Implications for further research involve expanding the sample size and including students from various educational institutions and cultural backgrounds to assess the generalizability of the proposed methodology. Additionally, research could explore the impact of immersive technologies on the development of creative autonomy in different styles of choreography individually and in cross-style combinations. Further experiments may also include longer training cycles and analysis of the long-term effects of using VR, AR and mixed reality on students' creative potential to develop appropriate strategies for integrating these technologies into arts education.

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