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36000, вул. Остроградського, 2, м. Полтава, Україна

E-mail: [info@pedsciences.com.ua](mailto:info@pedsciences.com.ua)

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## **Editors office address:**

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36003, 2 Ostrohradskyi Str., Poltava, Ukraine

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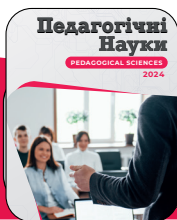
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**Olena Dudar\***

PhD in Psychology, Associate Professor  
Hryhorii Skovoroda University in Pereiaslav  
08401, 30 Sukhomlynskyi Str., Pereiaslav, Ukraine  
<https://orcid.org/0000-0003-0541-5646>

## Formation of leadership qualities among students using art therapy

**Abstract.** The research relevance is determined by the growing need to develop emotionally mature and responsible leaders who can effectively manage teams and make decisions in the current-day fast-paced world. Modern challenges require future professionals to possess not only technical knowledge but also a high level of emotional intelligence, creativity and teamwork. The study aimed to determine how art therapy can contribute to the development of these leadership aspects in the student audience and how it can be effectively integrated into the educational process. Methods of theoretical analysis, synthesis, generalisation and systematisation of scientific literature related to art therapy and leadership qualities were used in the study. The main results of the study demonstrated that art therapy is effective in raising emotional awareness among students. During classes on self-expression through art, students learned to better understand personal emotions and recognise their impact on decision-making, which directly improved their leadership skills. Furthermore, art therapy sessions helped students learn how to regulate emotional reactions through the creative process, which reduced stress and developed emotional resilience. Another important result was the improvement of communication skills and the ability to collaborate, as group art therapy tasks encouraged students to interact with each other, discuss their efforts and develop empathy. Art therapy was also substantial in the development of creative thinking, which helped students approach complex problems in a non-standard way and look for innovative solutions, which is important for leaders in the modern world. The practical significance of this study is determined by the promotion of the integration of art therapy into the curricula of various specialities to promote the development of emotional maturity and leadership skills

**Keywords:** social skills; group dynamics; empathy; interactive methods; personal growth

### INTRODUCTION

Modern society is facing new challenges that require future leaders to have not only managerial and organisational skills but also a high level of emotional competence, creativity and self-expression. The development of these qualities is becoming a priority in education, particularly among students preparing for future professional activities. Art therapy, as an innovative method of influencing the individual, is gaining popularity among educational and psychological institutions. It not only promotes the development of creativity and emotional expression but also helps to develop important social and leadership qualities that

are relevant in modern conditions. However, despite the potential benefits of art therapy, its role in developing students' leadership skills remains insufficiently studied.

One of the key issues in this context is the determination of the effectiveness of art therapy methods in developing leadership skills such as communication, decision-making, creative thinking and emotion management. The answer to the question is even more relevant in the context of traditional approaches to education, which may not provide a comprehensive development of these qualities. The research relevance is determined by modern

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\*Corresponding author



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students, as future leaders, facing new requirements of cultural sensitivity and adaptability in an uncertain environment. Recent studies confirm the significant role of artistic approaches in developing students' leadership skills. B. Wahrudin (2024) noted that the use of art therapy methods in education contributes to the development of creativity, which is an important component for future leaders. Involving students in creative tasks not only formed new ideas but also improved efficiency in solving problems, which developed initiative and responsible decision-making.

In contrast, the study by H. Leigh (2021) analysed pedagogical practices in art therapy that promote the development of emotional intelligence and communication skills. The use of specific approaches to learning through art improved emotional awareness and interaction with others among students. This is the basis for developing leadership skills, as emotional competence is crucial to leadership. An original approach to leadership through the arts was proposed by B. Sandberg *et al.* (2023), who defined it as a dance. The study demonstrated that art therapy stimulated the development of empathy and social skills, which helped students in leading teams. Thanks to these methods, leaders were able to better understand the needs of others and interact more effectively with them.

S. Holtham & M. Biagioli (2021) emphasised the importance of innovative approaches to learning, including the hybridisation of artistic and leadership practices. They concluded that the introduction of art therapy into leadership development programmes increases students' ability to think critically and make decisions, which are integral components of successful leadership. In turn, G.J. Puccio *et al.* (2020) emphasised how teamwork in art therapy sessions contributes to the creativity and effectiveness of leaders. The study proved that creative tasks in groups develop the ability to make collective decisions and leadership, which makes artistic approaches important in educational programmes for training future leaders.

A book by N.W. Brown (2023) described practical examples of creativity in group therapy that contribute towards the development of social skills and teamwork. These skills are critical for leaders as they can effectively communicate and collaborate with others. In contrast, L. Jackson (2020) highlighted the concept of cultural humility in art therapy, which helps therapists and their clients to better understand and respect cultural differences. This is especially important in the context of leadership, where the ability to accommodate diversity and create an inclusive environment are key success factors. With the development of technology, art therapy is also becoming a part of the digital world. A. Zubala *et al.* (2021) conducted an integrative review of the current practice of art therapy in the digital environment and possible directions for the development of this field. The use of digital technologies in art therapy creates new opportunities for creative expression and leadership development in distance learning. S.A. Malchiodi (2020) studied the impact of traumatic experiences on a person and the role of art therapy in the healing process.

The author emphasised that by art, it is possible to not only express emotions but also process them, which is beneficial for the development of emotional resilience, a requisite quality for leaders. A systematic review by M. De Witte *et al.* (2021) analysed therapeutic factors and mechanisms of change in creative therapies. Their study emphasises that the use of creative approaches in therapy can promote significant personal change, including the development of leadership skills.

The aforementioned studies insufficiently addressed practical approaches to the integration of art therapy into the educational process for the purposeful development of leadership skills among students. A lack of specific examples of art therapy methods used to develop such qualities as initiative, responsibility and decision-making skills in the context of leadership is also evident. The study aimed to analyse how the use of art therapy can contribute to the development of important management skills in students. The objective was to identify specific art therapy approaches that can effectively influence the development of such key competencies as emotional maturity, creative thinking, communication skills and self-control.

## MATERIALS AND METHODS

The first step was to conduct a detailed literature review to collect the necessary information and determine the state of research in this area. The selection of scientific literature for analysis was based on several criteria. Firstly, sources were required to be based on scientific evidence, confirmed by publications in established databases such as Scopus, Web of Science and others. The choice of literature was also based on the relevance to the research topic, i.e. the sources had to be related to both art therapy and leadership development. The search for the necessary literature was conducted using the following keywords: "art therapy", "leadership development", "emotional intelligence", "communication skills", "student leadership", "creativity in leadership", "group dynamics", "initiative in leadership". Studies that address the impact of art therapy on emotional and social development were also covered, as these aspects are directly related to the formation of leadership skills.

Scopus, Web of Science, ResearchGate, and Google Scholar were the main databases used to search for scientific articles, which was used to attract a wide range of relevant research. The choice of these databases is determined by their credibility and the large number of scientific publications related to the topic under study. The criteria for selecting the sources were the availability of peer-reviewed publications, modernity (publication date no earlier than 2020), and a focus on art therapy and leadership research. The next stage of the study was a systematisation of the information obtained and its detailed structuring by key leadership components: emotional intelligence, creative thinking, communication skills and self-regulation. This identified how different art therapy methods contribute to the development of each of these skills and was also used to compare their effectiveness in different educational



programme settings. In particular, the study analysed how creative approaches to student education can improve decision-making, teamwork, and emotional resilience. This approach described the impact of art therapy on leadership development in greater detail and laid the foundation for further research.

The impact of different art therapy methods, such as drawing, music, sculpture and drama practices, was analysed. The study of these methods identified changes that occur in students during art therapy. The benefits of each method were studied in the context of developing certain aspects of leadership, including emotional maturity, creative expression, and the ability to collaborate. The effect of different types of art on the development of personal qualities and psychosocial skills was determined.

At the final stage, a comparative analysis of the collected data was conducted, which concluded on the effectiveness of art therapy for leadership development. The analysis included an assessment of the strengths and weaknesses of different art therapy approaches, their relevance to achieving the goals set, and their adaptability in different cultural and social contexts. This was used to identify the most effective approaches for different groups of students and draw relevant conclusions on the use of these approaches in educational programmes.

## RESULTS

Leadership is the process of influencing others to achieve a common goal, including the ability to inspire, motivate and direct the actions of members of a group or organisation. It is based not only on managerial skills but also on emotional competence, empathy and the ability to communicate effectively, addressing the individual needs and motivations of other participants in the process (Northouse, 2021). Art therapy, using creative processes such as drawing, sculpting, or music, helps people explore feelings and develop emotional competence. Through artistic expression, participants can gain a deeper understanding of personal emotions and conflicts, thereby rendering art therapy valuable not only for personal growth but also for developing the qualities necessary for effective leadership.

First, art therapy sessions raised emotional awareness. During sessions focused on self-expression through art, students could explore personal feelings and creatively express them. This provided a greater understanding of personal emotions, which previously could have remained unnoticed or suppressed. The use of artistic materials such as paint, clay or music created a safe space for experimenting with emotions, where students could freely express their feelings without fear of judgment. As a result, students were more aware of personal emotional states and identified the triggering events. One example of this awareness was the identification of anxiety and fear by students during creative tasks. Instead of avoiding these feelings, students could face these feelings through artistic expression (Beerse *et al.*, 2020). Hence, students not only identified personal emotions but also gained a better understanding

of personal nature. The growth of emotional awareness contributed to the development of the ability to separate emotional reactions from rational decisions, which is an important aspect of effective leadership.

Another important aspect of the changes was the improvement of the ability to regulate emotional reactions. During the art therapy sessions (namely drawing), students learned to use creative methods to release tension and manage stress. Instead of resorting to negative emotions such as anger or frustration, students found ways to express these feelings through art. This not only reduced emotional intensity, but also offered constructive ways to process them. For instance, during drawing classes, students could transfer their negative emotions to paper, creating paintings that reflected their inner state (Gladding, 2021). This process relieved emotional tension and provided peace of mind. This practice not only improved emotion management, but also contributed to the development of emotional resilience. Students learnt not to avoid emotional challenges but to find ways to process them, which is crucial for effective leadership, especially in times of stress or conflict. They acquired skills that helped them to better cope with emotional challenges while maintaining productivity and concentration on tasks.

In addition, art therapy contributed to the development of empathy among the participants. During the group sessions, students could discuss their artwork and share the emotions behind the creations. As such, participants could perceive the world from a different standpoint and experience the feelings and emotions of their classmates. Hence, students developed the ability to treat others with understanding and compassion. This experience contributed to the development of empathy, which is a key component of emotional intelligence and an important element of leadership. Art therapy is a substantial method for the development of creativity and imagination, especially among students seeking self-expression and innovative thinking. The use of art as a therapeutic technique enables participants to discover new horizons of personal capabilities and develop unconventional thinking, which is critical in the modern dynamic world. Different art therapy practices create a unique environment where students can experiment with different forms of expression without fear of making mistakes or being judged, which helps to develop their creative confidence.

One of the key aspects of art therapy is the creation of a safe space for self-expression. Contrary to traditional teaching methods, which can limit the creative process with clear rules or expectations, art therapy provides students with the freedom to use any medium and technique that corresponds to feelings. For instance, during an art therapy session, students can choose from a wide range of materials – from paints and pastels to clay and textiles – to create an artwork. This freedom of choice encourages participants to experiment with new forms of expression, which helps foster creative thinking. Students who may not have previously considered themselves creative discover



new talents and abilities, which contribute to their personal and professional growth.

Art therapy also promotes creativity through stimulating imagination (Table 1). By performing creative tasks, students move beyond conventional thinking patterns, which helps develop the perception of new possibilities and solutions to problems. For instance, during an art therapy session, students may be asked to create an abstract

painting that reflects personal emotions or moods. This process forces unconventional thinking on how to convey abstract concepts through specific shapes and colours, which requires the development of creative imagination. Such tasks not only contribute to the development of artistic skills but also help participants to develop the ability to think abstractly, which is important for solving complex problems in any field of activity.

**Table 1.** The impact of art therapy on the development of creative abilities and creativity among students

The direction of influence of art therapy	Description of the impact	Examples of effects
Creation of a safe space	Provides freedom for creative expression	Students experiment with different materials (paints, clay, textiles)
Stimulation of imagination	Encourages the use of imagination to create new images	Abstract drawing tasks help develop abstract thinking
Reflection and introspection	Promotes a deeper understanding of your own emotions and thoughts	Discussion of created works helps analyse creative solutions
Development of cooperation	Promotes interaction and exchange of ideas among participants	Group projects, such as collage making, improve teamwork skills
Overcoming creative barriers	Reduces the fear of failure and mistakes	The value of the creative process, not just the result, is emphasised
Use of metaphors and symbols	Can be used to express complex ideas and feelings	The use of symbols (e.g. a tree to express difficulties) develops associative thinking.

**Source:** developed by the author based on J. Jue & J.H. Ha (2020)

Furthermore, art therapy helps students develop creativity through reflection and introspection. After creating an artwork, participants are often invited to discuss the creations, which allows them to gain a broader understanding of personal emotions and thoughts. This discussion helps to develop the ability to self-reflect, which is an important aspect of the creative process. Students learn to analyse their creative decisions, understand what influenced their choices, and find new ways to express their ideas. This practice helps to develop critical thinking and the ability to see connections between different aspects of their experience, which is the basis for creativity.

Notably, art therapy also helps overcome creative barriers and fear of failure. Often students are afraid of experimenting and subsequent failure by doing an “imperfect” job. With Art therapy, students can overcome these limitations by emphasising the value of the process rather than the result. The therapy helps participants understand that creativity is not about perfection but about self-expression and exploring new possibilities. Finally, art therapy fosters creativity using metaphors and symbols, allowing students to express complex ideas and feelings that are difficult to put into words. It helps develop associative thinking and the creation of new concepts, which is crucial for innovative thinking.

Art therapy has proven to be effective in improving the communication skills of students, which is an important aspect of their personal and professional development. Communicating and interacting with others are key skills that are necessary for successful leadership and collaboration in any environment. These changes can be perceived through increased emotional expressiveness, improved listening skills, enhanced ability to collaborate and

stronger interpersonal relationships. One of the key changes observed after the art therapy sessions is an increase in students’ emotional expression. With art therapy, participants can express emotions through artistic means such as drawing, sculpting or music. This process helps students become more aware of personal feelings and discover new ways of expression, which directly affects the efficiency of communication. This can be achieved through art therapy techniques such as creating paintings that reflect their inner state or writing poetry that expresses their emotions. As a result, students became less withdrawn and fearful, allowing them to interact better with others.

Improved ability to cooperate is another important aspect of the changes observed after art therapy. In the process of performing creative tasks in groups, students are forced to cooperate to achieve a common goal. This can be the creation of a collaborative collage, a group performance, or the development of a large art project (Varii *et al.*, 2020). Such tasks require participants to communicate, coordinate actions and accept the opinions of others. During such activities, students learn to find compromises and distribute roles and responsibilities, which contributes to the development of their ability to work as a team. For instance, during the creation of a joint installation, students had to discuss and agree on their ideas, which helped them to better understand the importance of cooperation and mutual respect.

Thus, the strengthening of relationships is another significant outcome of art therapy. During the creative process, students can collaborate on projects, and share their thoughts and feelings, which helps build trust and support in the group. This is particularly relevant for students who may experience social isolation or communication difficulties. Art therapy helps to create a sense of community and

belonging in the group, which contributes to the development of deeper and more meaningful relationships. Participants in art therapy groups have noted becoming closer to each other and better understanding their classmates. This has a positive effect on the atmosphere in the study groups and helps to create a supportive environment. In addition, art therapy helps develop confidence in personal communication skills. Participants in art therapy sessions are often forced to step out of their comfort zone by expressing their ideas and opinions in front of others. This helps overcome the fear of public speaking and communication in general. Students who may have previously felt insecure or afraid of communication can practice these skills in a safe and supportive environment. As a result, they become more confident in their ability to communicate and interact with others, which is important for personal and professional development.

Student life is often accompanied by challenges that require young people to exercise self-control and effectively manage stress. By offering unique means of self-expression, art therapy helps students develop these critical skills that allow them to maintain emotional balance and effectively cope with stressful situations. Research shows that art therapy can be effective in reducing cortisol levels. One study conducted among students determined that participation in art therapy sessions for several weeks resulted in a significant decrease in blood cortisol levels (Beerse *et al.*, 2020). This confirms that the creative process has a calming effect and can be used for stress management. Through regular art therapy sessions, students can learn how to manage their stress and avoid its accumulation, which is important for maintaining mental health.

Art therapy can also train students in effective relaxation and stress management techniques that they can use in their daily lives. For instance, during art therapy sessions, students may be introduced to techniques such as meditative drawing or collaboration on a mandala. Providing focus and peace of mind. By practising these techniques, students learn to focus on the present moment and release negative thoughts, which is essential for managing stress. Group art therapy sessions can also help develop coping skills through social support and interaction. By collaborating on creative projects together, students can share experiences and support each other in difficult situations. This creates a sense of community and safety, which helps reduce stress levels. In group art therapy, students can discuss their problems and challenges, receiving support and advice from their fellow students. This interaction helps them feel that they are not alone in their experiences and find new ways to cope with stress.

An important aspect of art therapy is also the development of patience and the ability to accept the process as part of self-control. The artistic process often requires time and effort to achieve the desired result. Through art therapy, students learn patience and the recognition that results are not always immediate. This helps develop the ability to control impulsive reactions and understand the

importance of consistency in achieving goals. Completing a challenging art project can require extensive trial and error, which teaches students not to give up and to keep working towards their goals. Art therapy is not only a method of personal development and emotional healing but also a substantial technique for building key leadership qualities such as responsibility, initiative and decision-making. These qualities are critical for future leaders who seek to effectively manage teams, make informed decisions and inspire others to achieve common goals. Participation in art therapy classes allows students to develop these qualities through practical experience of self-expression, reflection and interaction.

First, art therapy promotes responsibility through creative projects that require students to be independent and self-controlled. During art therapy sessions, students are often tasked with the creation of personal artwork or collaboration. This requires responsibility for personal actions and results. Art therapy also promotes the development of initiative, which is another important leadership quality. The creative process encourages students to express themselves and experiment, which helps develop the initiation of new ideas and projects. For instance, in the process of a creative assignment, students may be invited to create something new that has not been predefined by the instructions (Drinkwater & Waghid, 2024). This encourages unconventional thinking and initiative in offering ideas. In one study that examined the impact of art therapy on the development of initiative among students, it was found that participants became more open to new ideas and ready to take responsibility for their implementation. They began to propose their ideas more actively in study and work groups, which indicates an increase in their initiative.

An important part of leadership is decision-making, and art therapy is instrumental in developing this skill. The creative process requires participants to make numerous decisions, from choosing materials and techniques to determining composition and colour. This experience helps students develop the ability to analyse and evaluate situations, make decisions and take responsibility for their consequences. For instance, during an art therapy session, students may be tasked with creating a piece that reflects a particular theme or concept. This requires decisions on how best to communicate their ideas through art. In the process, students learn to analyse situations, make choices and evaluate the outcomes of their decisions, which helps to develop their ability to make informed decisions. Art therapy also helps to develop decision-making through working under uncertainty and experimentation. The creative process often involves elements of uncertainty and risk, as participants may not know what the outcome of their work will be. This requires them to be able to make decisions with limited information and to be prepared to make mistakes. When experimenting with new techniques or materials, students may encounter unpredictable outcomes, requiring them to be flexible and adaptable (Caulfield *et al.*, 2021). This contributes to the development of the

ability to make decisions and take responsibility for their consequences, which are important for effective leadership.

In addition, art therapy promotes the development of responsibility, initiative and decision-making through group work and cooperation. By collaborating on creative projects, students can exercise leadership roles, coordinate group activities and make decisions related to teamwork. This contributes to the development of leadership skills, such as the ability to organise teamwork, motivate others and make informed decisions in the interests of the whole group. Such experiences help students develop responsibility, initiative and decision-making skills, which are essential for successful leadership. Notably, art therapy contributes to the formation of key leadership qualities through the development of self-reflection and self-knowledge (Long Lingo, 2020). Students engaged in art therapy

can better understand their emotions, motives and behavioural patterns, which contributes to the development of responsibility for their actions and decisions. This helps them become more conscious leaders who can effectively manage not only their actions but also influence others.

Art therapy, utilising a variety of art forms, offers a wide range of methods that can be effective for leadership development (Table 2). Drawing, music and drama are three popular art therapies used to promote personal growth and leadership development. Each of these methods has its unique characteristics and can influence the development of different aspects of leadership, such as responsibility, initiative, decision-making, communication skills and emotional intelligence. This text will discuss in detail how these methods help develop leadership skills and compare their effectiveness.

**Table 2.** The main methods of art therapy

Name of method	The main essence of the method	Example of implementation, potential benefits
<b>Drawing</b>	Use of visual images for self-expression and exploration of inner states.	Students can draw emotions or stressful situations, which helps them better understand and process personal feelings.
<b>Music</b>	Use sounds, rhythms and melodies to express yourself emotionally and relieve tension.	Participating in music groups or listening to and creating music individually can reduce stress levels and improve mood.
<b>Dramas</b>	Use of theatre techniques such as role-playing and improvisation to express and explore emotions.	Students can participate in role-playing games to practice communication, decision-making and empathy skills.
<b>Modelling</b>	Forming images from materials such as clay or plasticine to physically release emotions and explore the self.	Modelling can help students express complex emotions and develop patience and concentration.
<b>Dance/Movement</b>	Using body movements to express emotions and relieve physical tension.	Dance sessions can help students relieve stress, increase self-esteem and improve the connection between body and mind.
<b>Writing</b>	Use of words to express thoughts, feelings and experiences. Can include writing stories, poems or keeping a diary.	Writing can be effective for reflection, self-analysis and the development of self-knowledge and self-control.

**Source:** T. Shafir *et al.* (2020), M. Eddy *et al.* (2021)

Drawing is one of the most common art therapies that allows participants to express their emotions, thoughts and experiences through visual images. This is especially relevant for students who may have difficulty verbalising their feelings or thoughts. Drawing can be used to explore feelings in a safe and creative environment. Research has shown that drawing can help develop leadership skills such as responsibility and initiative. For instance, when drawing, students are free to choose topics, materials and techniques, which helps them to take initiative and responsibility for their creative decisions. Students also learn to plan their actions and manage their time, which are important skills for leadership. One study conducted among students who participated in drawing as art therapy found that they became more confident in their creative abilities and more willing to take responsibility for their actions (Meltzer & Schwencke, 2020). This study also demonstrated that drawing helps students develop their ability to reflect, as they often reflect on their work and its meaning. This contributes to the development of self-awareness and the ability

to make informed decisions, which are important for effective leadership.

Music is a substantial channel for emotional expression and communication, effective in leadership development. Music can help participants reduce stress, improve mood and develop emotional intelligence. Music art therapy sessions often involve listening to music, performing music, or improvisation, allowing participants to express their feelings and moods. Research shows that music can help develop leadership skills such as emotional intelligence and collaboration. Participation in music groups or ensembles requires participants to coordinate, listen carefully and interact with other musicians, which helps to develop collaboration skills.

Drama is one of the most active art therapies, which involves the use of theatre techniques such as role-play, improvisation and stage performance to explore and express emotions and experiences. Drama allows participants to assume different roles, developing understanding and empathy with others. This contributes to the

development of leadership qualities such as communication skills, self-confidence and decision-making. Participants in drama therapy sessions learn to communicate effectively, express their thoughts and emotions, and interact with other participants. One study that examined the impact of drama on leadership development among students found that participants became more confident in their ability to speak in front of an audience and interact with others (Gkintoni *et al.*, 2022). They also learned to make decisions in the face of uncertainty, as role-playing often requires quick decision-making and adaptation to new situations. This contributes to the development of leadership skills, as participants learn to take responsibility for their actions and influence others.

Each of the art therapies discussed has unique benefits and can contribute to the development of different aspects of leadership skills. Drawing is effective in developing responsibility and decision-making as it encourages self-expression and reflection. Music, due to its ability to influence emotions and create a sense of community, is particularly effective in developing emotional intelligence and the ability to collaborate. Drama, as an active and communicative method, contributes to the development of communication skills, self-confidence and the ability to make decisions in conditions of uncertainty. The introduction of art therapy practices into educational programmes opens new opportunities for students to develop leadership skills. Modern education is increasingly focused on training not only qualified professionals, but also leaders who can effectively manage teams, make responsible decisions and implement innovations. Art therapy, with its creativity stimulation, emotional intelligence and personal growth potential, can be an important element of the educational process.

Research shows that art therapy can significantly improve students' emotional intelligence, which is critical for leadership. For instance, a study of university students demonstrated that participation in scheduled art therapy sessions improved their ability to understand and manage their emotions. Students who participated in such sessions became more aware of their emotional reactions, which helped them to cope better with stressful situations and conflicts (Kilag *et al.*, 2023). The ability to manage emotions and understand the feelings of others is important for effective leadership, as it helps create a positive work environment and maintain team spirit. Art therapy can also promote creative thinking and initiative among students. Creative tasks encourage students to find non-standard solutions and experiment with new ideas. This helps develop the ability to think innovatively, which is important for leadership in today's dynamic world. For instance, during art therapy sessions, students can be invited to create a project that reflects their vision of solving a particular problem. This approach helps develop their initiative and willingness to take responsibility for the implementation of their ideas.

Communication skills are another important component of leadership, and art therapy can significantly contribute to their development. During art therapy sessions,

students work in groups and discuss ideas and creative solutions, which develops communication and collaboration skills. They learn to listen and appreciate the points of view of others, which is important for effective communication. Participants in the art therapy sessions can also deliver presentations to the group, which helps develop confidence in communication skills. There are also prospects for using art therapy in distance learning. Modern technologies allow for online art therapy sessions, which expands the possibilities for using this approach in education. Online art therapy can include drawing, music, writing, or video assignments, allowing students to work on their projects independently and share the results with their classmates and teachers. This helps develop creative expression and communication skills even in a remote format.

The successful implementation of art therapy practices in educational programmes requires the training of qualified teachers and therapists who have experience in working with art and psychology. Teachers should be trained to support students in their creative process, encourage self-expression and create a safe and supportive environment. In addition, it is necessary to ensure the availability of materials and resources for art therapy sessions, allowing students to experiment freely with different art forms. Several areas can be suggested to further improve the use of art therapy. Firstly, it is advisable to develop individual art therapy programmes that address the characteristics of each student and their level of emotional development. Secondly, more research is needed to assess the impact of different forms of art therapy (drawing, music, drama, etc.) on the development of certain aspects of leadership. Thirdly, it is worth investigating how art therapy affects different age groups of students and representatives of different academic disciplines to determine how these methods work in different educational contexts.

## DISCUSSION

Several areas can be suggested to further improve the use of art therapy. Firstly, it is advisable to develop individual art therapy programmes that address the characteristics of each student and their level of emotional development. Secondly, more research is needed to assess the impact of different forms of art therapy (drawing, music, drama, etc.) on the development of certain aspects of leadership. Thirdly, it is worth investigating how art therapy affects different age groups of students and representatives of different academic disciplines to determine how these methods work in different educational contexts. In particular, the results of this study are consistent with the findings of E. Gkintoni *et al.* (2022), who point to the significant role of emotional competence in leadership skills. The authors emphasised that the development of emotional intelligence is key to successful leadership, especially in educational institutions. They emphasised that the ability to understand and manage emotions has a positive impact on decision-making and teamwork. The results of this study, including the improvement in students' ability to manage



their emotions after art therapy, confirmed these findings and demonstrated the practical benefits of introducing art therapy into educational programmes.

Regarding the cooperation and communication skills of the students, the study revealed significant improvements in these skills after the art therapy sessions. During the creative tasks, students were tasked with active interaction with each other, exchanging ideas and finding common solutions, which significantly influenced their ability to communicate effectively and work in a team. This is especially evident in group projects, where each participant played a different role, learned to listen to others, express their own opinions and cooperate to achieve a common goal. These results are consistent with the research by J.D. Fair & A.E. Kondo (2020), which studied the impact of team projects on the development of communication skills among students. The study emphasised that teamwork encourages students to actively collaborate, understand each other, and build effective communication strategies. The present study confirmed these findings: art therapy, in particular group sessions, creates conditions for open discussion and exchange of emotions, which helps students not only improve their communication skills but also develop empathy and the ability to understand others. It is also worth noting that this approach contributes to the development of leadership skills, as students learn to take responsibility for the outcome of group work and manage the communication process.

One of the important aspects of the study is the development of initiative and creative thinking among students. Art therapies encourage participants to experiment with new ideas, take initiative and take responsibility for the implementation of creative projects. This finding correlates with the results of J. Brooks (2022), highlights the importance of developing creative thinking in leaders. The author stressed that the ability to generate new ideas and implement them is one of the main characteristics of a successful leader. The results of this study show that art therapy can contribute to the development of this quality by creating a safe space for creative expression.

The results of this study also indicate a significant impact of art therapy on the development of responsibility in students. During the art therapy sessions, participants were given tasks that required them to be independent and responsible for the result. This correlates with the study by F.S. Andreu *et al.* (2020), where the authors emphasised the importance of engaging students in responsible learning experiences that allow them to develop responsibility and autonomy. The present study demonstrated that students who participated in art therapy improved responsible decision-making skills, which confirms the benefits of this approach for leadership development. Equally important is the development of decision-making skills, which was also observed in the study. Art therapy creates an environment for students to make choices on creativity, training decision-making in the context of uncertainty. This correlates with the study by B.E. Bartels &

C.E. Jackson (2021), which highlighted the importance of meaningful leadership and the ability to make important decisions in difficult circumstances. Art therapies demonstrated effectiveness in developing this skill, as students can engage in multiple-choice situations.

It is necessary to investigate in detail the possibilities of introducing art therapy into various curricula, covering adaptation to different academic disciplines and the specific needs of students. The study has demonstrated that art therapy methods positively influence the development of leadership qualities such as responsibility, initiative and the ability to collaborate, making this approach a valuable tool for educational institutions. C. Friendly *et al.* (2021) emphasised the need to develop specialised curricula that include modules aimed at developing leadership skills through creative methods. The results obtained in this study confirmed the feasibility of integrating art therapy into educational programmes, as it helps students better understand their emotions and make informed decisions in difficult situations. Adapting art therapy to different disciplines can be widely used. For instance, in the humanities, art therapy can be used to develop emotional intelligence and self-expression, while in technical disciplines it can help develop creativity and out-of-the-box thinking. Art therapy has the potential not only to enhance the personal development of students but also to create conditions for deeper learning. This is confirmed by the results of this study, where students involved in art therapy sessions demonstrated an increase in emotional maturity and initiative, which are critical for effective leadership. C. Friendly *et al.* (2021) also emphasised the importance of an individual approach to learning, which is achieved through the introduction of art therapy practices. Students should be allowed to work in a creative environment where they can discover new approaches to solving problems while developing their leadership skills.

It is necessary to address cultural and social differences that may affect the effectiveness of therapeutic approaches. E. Leffler (2020) emphasised that leadership development varies according to individual, national and cultural characteristics. This challenges the universality of certain art therapy methods and creates prospects for studying their adaptation in the context of multicultural environments. Research on the impact of art therapy in international and diverse social contexts may reveal new opportunities for its application, allowing for more flexible leadership development programmes that consider the unique needs of each group.

The results of this study show that art therapy methods significantly influence the development of key leadership qualities in students, such as emotional intelligence, ability to cooperate, initiative and responsibility. Art therapy improves emotional awareness, regulation of emotions, and teamwork skills. Students developed a better understanding and emotion management, which had a positive impact on their leadership skills and ability to make responsible decisions. The analysis confirmed that art

therapy methods can be effective for leadership development, which is consistent with the findings of other studies. It also emphasised the importance of adapting art therapy to different social and cultural contexts, as the effectiveness of these methods may depend on the individual characteristics of students.

### CONCLUSIONS

The results of the study demonstrated that art therapy is an effective tool for developing key leadership qualities in students, such as emotional intelligence, communication skills, responsibility and initiative. Those who participated in art therapy sessions showed significant improvements in their emotional awareness, and ability to cooperate and make decisions, which are important components of effective leadership. This leads to the conclusion that it is advisable to include art therapy in the curriculum for students aimed at developing leadership skills.

The analysis of the results showed a significant increase in the level of emotional competence among students who have undergone art therapy. Students developed a better awareness of personal emotions and more effective control over them, which, in turn, increased their ability to manage emotional reactions in stressful situations. This is a significant indicator of the development of emotional intelligence, a key factor in the development of leadership skills. Furthermore, a significant improvement in communication skills and collaborative capacity was recorded:

students became more open to interacting with others, expressed opinions more effectively and actively participated in teamwork. Improvements were also noted in the development of initiative and responsibility. Students became more proactive, offering new ideas and solutions in academic and extracurricular projects, taking responsibility for tasks and becoming more confident in their actions. These changes indicate that art therapy stimulates not only creativity but also contributes to the development of important leadership skills that help students prepare for future professional activities.

Further study should address the long-term effects of art therapy on the development of leadership skills. It is also necessary to investigate how regular use of art therapy practices affects students' ability to manage emotions, make decisions, and work in a team. Of particular interest is the study of the possibilities of remote implementation of art therapy, which would allow the development of leadership skills even in virtual learning environments. Further research could also focus on the impact of art therapy in different cultural and social contexts to better understand the universality of these approaches.

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### CONFLICT OF INTEREST

None.

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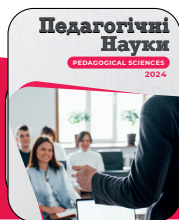
## Олена Дудар

Кандидат психологічних наук, доцент  
Університет Григорія Сковороди в Переяславі  
08401, вул. Сухомлинського, 30, м. Переяслав, Україна  
<https://orcid.org/0000-0003-0541-5646>

### Формування лідерських якостей студентів засобами арттерапії

**Анотація.** Актуальність даного дослідження обумовлена зростанням потреби у формуванні емоційно зрілих і відповідальних лідерів, здатних ефективно управляти командами та приймати рішення в умовах сучасного швидкозмінного світу. Виклики сучасності вимагають від майбутніх фахівців не лише технічних знань, але й високого рівня емоційного інтелекту, креативності та здатності до співпраці. Метою дослідження було визначити, яким чином арттерапія може сприяти розвитку цих важливих аспектів лідерства в студентській аудиторії та як її можна ефективно інтегрувати в освітній процес. У ході дослідження було застосовано методи теоретичного аналізу, синтезу, узагальнення та систематизації наукової літератури, пов'язаної з арттерапією та лідерськими якостями. Основні результати дослідження показали, що арттерапія є ефективним інструментом для підвищення емоційної свідомості студентів. Під час занять, орієнтованих на самовираження через мистецтво, студенти навчалися краще розуміти власні емоції та усвідомлювати їх вплив на прийняття рішень, що безпосередньо покращувало їхні лідерські якості. Крім того, арттерапевтичні сесії допомогли студентам навчитися регулювати емоційні реакції через творчий процес, що сприяло зниженню стресу і розвитку емоційної стійкості. Іншим важливим результатом було покращення комунікативних навичок і здатності до співпраці, оскільки групові арттерапевтичні завдання спонукали студентів взаємодіяти один з одним, обговорювати свої роботи та розвивати емпатію. Також значну роль арттерапія відіграла у розвитку креативного мислення, яке допомогло студентам підходити до вирішення складних завдань нестандартно та шукати інноваційні рішення, що є важливим для лідерів у сучасному світі. Практичне значення цього дослідження полягає у сприянні інтеграції арттерапії в навчальні програми різних спеціальностей задля сприяння розвитку емоційної зрілості та лідерських якостей

**Ключові слова:** соціальні навички; групова динаміка; емпатія; інтерактивні методи; особистісний ріст



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### **Oksana Vashak\***

PhD in Pedagogical Sciences, Associate Professor  
Poltava V.G. Korolenko National Pedagogical University  
36000, 2 Ostrohradskyi Str., Poltava, Ukraine  
<https://orcid.org/0009-0006-5079-6555>

### **Oksana Vilkhova**

PhD in Pedagogical Sciences, Associate Professor  
Poltava V.G. Korolenko National Pedagogical University  
36000, 2 Ostrohradskyi Str., Poltava, Ukraine  
<https://orcid.org/0000-0002-9152-2511>

## **The formation of the professional competence of the educator as a condition for the positive image of Preschool Education Institutions : Literature review**

**Abstract.** In wartime, the Ukrainian pedagogical community is aware of the country's critical need to train qualified professionals. Despite the difficult circumstances, the youth of Ukraine is actively involved in the educational process aimed at educating and training highly qualified teachers for preschool education institutions, which is an important step in countering aggression and ensuring the future development of the state. The purpose of the article was to substantiate the importance of developing the necessary competencies of teachers to ensure quality educational services in preschool education institutions. The methodology of the study was based on the analysis of scientific literature and comparison of modern educational practices to determine effective approaches to the development of teachers' professional competences in preschool education. The concept of "competence" was described in the article and the role of the educator in the modern educational space of the preschool institution education was characterised in it. The peculiarities of the formation of a positive image of the PEI and its influence have been clarified by effective interaction between the teacher and the pupils for the assimilation of knowledge and formation of relevant competencies in preschool children. In order to effectively implement the assigned tasks, to educate children's cognitive interest, the teacher must possess professional competencies that will allow them to properly organise the educational process in the modern PEI. This includes the ability to interact with other teaching staff, organisation of work by parents, monitoring and evaluation of the results of educational activities for preschoolers, use of innovative technologies, as well as adaptation to changes in the modern educational environment. The article focused on the fact that in the structure of professional competence of future teachers of preschool education institutions is distinguished several components are distinguished by scientists: psychological, theoretical, technological, and effective by scientists. The results obtained can be used by teachers to improve interaction with children, organise work with parents, and introduce innovative technologies in the modern educational environment

**Keywords:** institution of preschool education; teachers of preschool education; professional competences; preschool children; professional activity; pedagogical skill

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\*Corresponding author



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## INTRODUCTION

The professionalism of a preschool teacher is determined by his ability to organise the educational process, create a favourable atmosphere for the development and learning of children, and apply innovative methods and approaches. It is also important to be able to understand the individual characteristics of the child to help with the development of emotional intelligence and personality formation. The important place is occupied by effective interaction with parents, colleagues, and the resolution of conflict situations; the ability to build partnerships; readiness for continuous learning; professional development; and the ability to take a creative approach in organising classes. Increasing the requirements for the professional training of teachers is also determined by the stratification of Ukrainian society, as well as the emergence of different types of preschool education institutions, both in terms of functions and form property.

In this connection, there is a need to create a positive image of IPE, the teaching team as a whole, and each educator in particular (Aronova, 2020). Society sets certain requirements for the professional and personal qualities of the educator. First of all, he must have a special pedagogical education, knowledge of methods of preschool education and development of children, the ability to plan and organise the educational process, and knowledge of child safety rules and hygiene standards. Also, a teacher must have love for children, patience, benevolence, stress resistance, and the ability to quickly resolve conflict situations (Vynnychuk, 2020).

The main issues of the research problem were studied in the works of Ukrainian and foreign scientists. Yes, analysis of the concept "competence" is disclosed in the scientific publications of V. Bereka & L. Pisotska (2022). Their works also reveal the issue of professional training of preschool education workers. The question of the formation of individual components of professional competence for teachers of a preschool education institution was investigated by G. Belenka (2021). The authors also consider the European vectors of a new strategy for training preschool teachers. The essence of the professional image of a specialist and the features of his effective self-presentation were considered by M. Burdukalo (2020). However, in authors' opinion, the question of the formation of the educator's skills to effectively demonstrate his knowledge, skills and personal qualities, which increases the trust and authority of colleagues, parents and pupils, needs additional study. O. Stayenna (2022) offers a tool for evaluating the professional activity of an educator in the form of a special card that contains criteria for a comprehensive analysis of the work of preschool education specialists. This approach allows to structure the assessment process, which is important for methodologists and the administration of preschool education institutions, as it contributes to an objective assessment of the effectiveness of the educator's work.

The research of V. Bozhko (2015) and Y. Bordyug (2017) is devoted to the current problems of the teacher's

competence as an important modern requirement. They note that in the conditions of rapid changes in pedagogy and increasing requirements for the quality of educational services, educators must possess not only theoretical knowledge but also practical skills that will help them work effectively with children, support their development, and meet educational needs. The authors T. Husak (2019) and A. Klochko (2020) emphasise the fact that an educator must be not only a competent specialist but also flexible, ready to constantly improve his knowledge and skills. In their works, the key stages of the professional growth of educators, which include the formation of various pedagogical competencies, are considered. Researcher L. Nikiyuk (2018) in all their works considers self-education as a key element of the professional development of educators. It allows the educator to quickly respond to new pedagogical challenges, implement modern methods, technologies and maintain the high quality of educational services. In their research, Y. Paskevskaya (2021) deal with the definition of criteria and indicators of teacher competence. They note that this provides an objective approach to assessing the skills and knowledge of educators.

The main points on which researcher S. Sukhorukova (2020) emphasises are the appearance of teachers and their communication skills. They also consider the peculiarities of planning various activities in modern preschool education institutions. Researchers N. Tsibulyak (2019) and N. Vasylenko (2021) analyse the specifics of professional competence and readiness of kindergarten managers for innovative activities. They note that these are important components that are interconnected and determine the effectiveness of management and the development of the educational process in the conditions of modern challenges. A significant contribution to the organisation of the educational process at the institution of preschool education, the teacher's methodical competence, and innovative forms of methodological work were contributed by A. Bugaichuk (2021) that substantiated theoretical views on the problem of the organisation of educational space, cooperation with parents, provision of methodical materials of teachers, etc. The quality of preschool education, the proper development of a preschool child, directly depends on the professionalism of the teacher, the level of his development professional competence. In the works of all these researchers, in opinion, the concept of "image of a modern preschool education institution" "professional competence of a teacher" needs additional clarification, as well as an in-depth characterisation of the conditions of parents' choice of a kindergarten for their child, the peculiarities of reaching the heights of the specialists' pedagogical skills.

The purpose of the article was to substantiate the peculiarities of the educator's professionalism institution of preschool education, the level of development of his professional competence as a necessary condition for a positive image of a preschool education institution. This study used a number of theoretical methods to examine the problem at hand. The analysis of the scientific

literature involved a thorough review of relevant publications, which allowed us to identify current trends and research gaps in this area. Synthesis facilitated the integration of various sources, creating a holistic view of the problem and combining various data. Comparison helped to clarify the differences between theories and approaches, while classification helped to structure information, identify patterns and systematise data. Generalisation allowed for broader conclusions to be drawn, transforming specific findings into general principles for a deeper understanding of the problem under study.

### **THE ROLE OF EDUCATORS IN ENSURING QUALITY PRESCHOOL EDUCATION: COMPETENCIES, RESPONSIBILITIES, AND CHALLENGES**

In European pedagogical education, T. Telychko (2020) proves that child-centred education is actively promoted as a paradigm that is concretised through the formation of professional competence. Therefore, the teacher must be well versed in the organisation and content of activities in the kindergarten in different directions, since his work is aimed at the comprehensive development of the child. Understanding these aspects ensures effective upbringing and education of preschool children. A teacher who has a deep understanding of these issues ensures the successful development of children and creates conditions for their comfortable stay in kindergarten. The universally recognised competencies of the educator who is a master of his craft are in-depth knowledge in the field of pedagogy and psychology, support and motivation of pupils to learn, overcome difficulties, and support their initiative and independence; responsibility and discipline; and a creative approach to their activities (Romanyuk, 2022). In modern days, preschool education institutions need teachers who are able to plan and organise a pedagogically appropriate system of interaction in scientific positions, based on the age and individual characteristics of children, to carry out subject-subject organisation of work with children, which will be aimed at their development and self-development, and will regulate and adjust the course and results of the educational process taking into account feedback (Tsibulyak, 2019).

The teacher is a key specialist in the preschool education system, he is responsible for the organisation and implementation of the educational process in institutions of preschool education. The main purpose of its activity is to ensure the high quality of education and development of children from 3 to 6 years old. It is necessary to establish important aspects of the activity of the educator in the institution of preschool education. First, the educator is looking for a strategy and a pedagogical concept of the educational process. He develops plans and programs for the development of children, taking into account their individual characteristics. The teacher, together with other colleagues, creates an educational environment that promotes the development of cognitive, social, and emotional

skills of children (Mozyrko, 2021a). Secondly, the teacher provides pedagogical support to other teachers in institutions. He can organise trainings, seminars, and consultations for colleagues in order to improve their professional competence. An important part of this work is the exchange of experience and the implementation of modern pedagogical approaches. Thirdly, the educator monitors the results of educational work and conducts an analysis of their impact on children's development. It develops tools for evaluating children's achievements and monitoring their progress (Lytvynenko, 2021). In general, the teacher is the main link in the preschool system of education, which improves the quality and harmonious development of children, promotes professional growth of other educators, and achieves his educational goals. Organisational activity of the educator in the space of the preschool institution education is one of the key components of his work. This activity is directed to ensure the effective functioning of the preschool institution and optimisation of the educational process. The genesis of the problem of the educator's organisational activity in education in the space of the preschool education institution depends on socio-historical events, which influenced the development of this area:

- Changing approaches to preschool education. Throughout the history of development preschool education in different countries, there have been changes in approaches to the upbringing and education of preschool children. This led to the need to adapt the educator's activities to new educational trends and methodology.

- Growth of pedagogical requirements. Modern science and society leave preschool institutions with high requirements for the quality of education and development of children. A specialist must provide for a variety of needs for children, including inclusive education and development of social and emotional skills.

- The role of information technologies. The use of modern technologies in education requires the ability to organise and implement these technologies in the educational process, as well as provide pedagogical support for educators.

- The necessity for constant professional growth. Educators should definitely improve their qualifications and practice new pedagogical methods and approaches to meet modern educational requirements.

- Requirements of the social environment. Educational institutions must respond to the needs of society and parents that have changed over time, especially with military events in Ukraine. The educator must respond to sociocultural changes and adapt organisational processes under their influence (Gerasimenko & Doroshenko, 2022).

The special requirements for the teacher are determined by the essential role of the preschooler period of development in the process of personality formation. A teacher must be aware of the responsibility for the kid's childhood, own a high level of development of empathy, immediacy, emotional balance, creative imagination, spiritual generosity, etc.

### THE PROFESSIONAL COMPETENCE OF PRESCHOOL EDUCATORS: KEY QUALITIES, READINESS, AND INSTITUTIONAL IMAGE

A feature of the work of a teacher who interacts with children of preschool age is the significant load on his psychophysiological sphere. Therefore, to be a professional, significant qualities of a teacher include high efficiency, endurance, and balance. According to L. Artemova (2021), such a teacher-specialist can be considered professionally competent if they have thorough knowledge, have developed creative abilities, have perfect professional skills, have self-awareness, have pedagogical thinking, and have the skills of self-study and self-improvement. From a psychological and pedagogical point of view, it is appropriate to consider the educator as the key figure of preschool education, because he must define individual trajectories of a preschool child's personal development according to her age, physiological, and psychological characteristics. The educator, within the scope of his professional duties, must actively work also in the intellectual, social, physical, aesthetic, and personal development. As part of his professional duties, there are questions about caring for the psychological well-being of children, attention to their inner world, feelings, experiences, hobbies, and interests. The specified requirements are especially consistent with the future teacher, who must receive thorough psychological and pedagogical training during training knowledge and ability to be timely. The modern teacher must constantly look for new approaches to education and upbringing, try the latest pedagogical methods, implement technologies, and adapt them to the needs of modern children. It should also help children find answers and solutions, promoting the development of their independence, critical thinking, and creative abilities (Bereka & Pisotska, 2022).

The scientist G. Belenka (2021) in her works convinces us that the teacher who works in a preschool education institution is the best example for children. The structure of the teacher's professional competence, except for worldview personal positions, deep awareness, and practical skills, necessarily includes professionally important personal qualities. They provide the ability to act freely, confidently, and tolerantly depending on the available necessity and needs of the surrounding life. Analysing the views of different scientists on the problem of components of professional competence in the field of pedagogy, note that, having different scientific views, researchers emphasise such basic components of pedagogical activity. Modern teachers agree with the opinion of H. Mozyrko (2021b) that "a modern educator of preschool children is a professional teacher who focuses on the achievements and innovations of psychological and pedagogical science, possesses a variety of developing technologies for raising and teaching children, is capable of self-development and self-improvement, self-modelling, and self-projection in various spheres of life". This researcher singles out the following components of a professional teacher's competence: cognitive, professional-technological, informational,

communicative, and methodical. In the opinion of the authors of this study, the work of H. Belenka (2021) is quite valuable, which is in the structure of professional competence of future teachers of institutions of preschool education that distinguishes several components, which are presented as types of readiness:

- Theoretical readiness (the future teacher must be ready to apply a variety of pedagogical methods to ensure an effective educational process);

- Methodical readiness (includes the ability to develop educational programs and lesson plans and adapt them to the needs of a specific group of children);

- Psychological readiness (this is the ability to detect and understand the emotional state and behaviour of children, as well as to help them solve internal problems and conflicts)

- Reflective readiness (ability to analyse one's actions and their results, evaluate one's own pedagogical experience, learn from one's mistakes, and improve);

- Creative readiness (ability to generate new, original approaches to organising classes and solving pedagogical tasks) (Belenka, 2021).

The following criteria of competence include the socio-pedagogical activity of the educator. They are the advisory assistance to parents, the creation of conditions for children's socialisation, and the protection of interests and rights. These criteria are determined by the following indicators: knowledge of the main documents about the rights of the child and the responsibilities of adults in relation to children, as well as the ability to conduct explanatory pedagogical work with parents and other employees of the preschool education institution. Considering professional training of future educators, T. Telychko (2020) identifies four main components of their professional competence. The component of motivation and will includes goals, needs, motives, and values. It stimulates the creative expression of personality in the profession and ensures the manifestation of interest in professional activity. Knowledge about the methods of pedagogical activity to a greater extent is determined by their functional component, which is necessary for the design and implementation of certain pedagogical technologies. The communicative component of competence includes the ability to express an opinion clearly and be well understood, the ability to persuade and argue, the ability to present evidence and analyse, the ability to convey rational and emotional information, and the establishment of interpersonal relationships. The reflective component manifests itself in the ability to consciously control the results of one's activities and improve one's own level of development, has personal achievements, and the formation of such qualities and properties that awaken children to show creativity, initiative, focus on cooperation, and a tendency to introspection (Vasylenko, 2019).

Authors agree with the opinion of V. Bereka (2022), which is professional; the teacher's competence determines his pedagogical skill. Individual pedagogical abilities, without which educational activity is impossible, have



to become the leading qualities of a teacher. They include, for example, communication (the ability to use simple, accessible language for children, taking into account their age and level of development). This applies not only to vocabulary but also to intonation, pace of speech, facial expressions, and gestures. And this also includes professional communication (a number of communication skills and strategies that allow the educator to successfully fulfil his professional duties) (Bereka & Pisotska, 2022). Considering all of the above, the need for thoroughness is increasing study of the problem of the image of the preschool and vocational education institution competence of the educator of preschool children, developmental features, and his professionalism. The problem of the image of a modern educational institution is the the problem of finding, developing, and applying managerial, methodological, pedagogical, cognitive, and artistic and aesthetic means of creating a positive image of the educational institution. Under the condition of the formed positive image, the educational system becomes more presentable for teachers, because it can to provide them with stability and social protection, job satisfaction, and professional development. Authors are convinced that the stable positive image of the institution allows the parents of pupils to make sure of the correctness of their choice. Personal and professional qualities play a significant role in this process of the competence of the educator who works directly with children, using modern educational technologies in their interaction. In the author's opinion, clarification of the role and place of the educator's professional competence in creating the image of the IPE is an urgent and insufficiently studied problem.

### CONCLUSIONS

Specialists in the field of preschool education are of the opinion that the lack of pronounced abilities can be

compensated by the development of such important professional qualities as diligence, systematic work on oneself, conscientious attitude to one's duties, etc. A positive image facilitates an educational institution's access to better resources: financial, informational, human, etc. Having formed a positive image, the educational institution under equal conditions becomes more attractive for teachers, because it can provide them with stability and social protection, job satisfaction, and professional development. This is an important condition for the European direction of preschool education, its organic unity with ideas from the New Ukrainian school in the post-war period. The formation of a positive image of a preschool education institution is an important process that affects the reputation of the institution, the trust of parents, and the choice of it as a place for raising and educating children. The positive image helps to attract the new students, increase the level of satisfaction of the parent team, and contribute to the development of the institution thanks to sponsorship investments. Further research could focus on methods of forming a positive image of preschool education institutions and their impact on the quality of educational services. Studies of the effectiveness of resource mobilisation strategies and their role in creating a stable working environment for teachers are also promising.

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### CONFLICT OF INTEREST

There is no conflict of interest.

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### Оксана Вашак

Кандидат педагогічних наук, доцент  
Полтавський національний педагогічний університет імені В.Г. Короленка  
36003, вул. Остроградського, 2, м. Полтава, Україна  
<https://orcid.org/0009-0006-5079-6555>

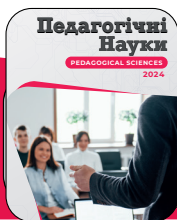
### Оксана Вільхова

Кандидат педагогічних наук, доцент  
Полтавський національний педагогічний університет імені В.Г. Короленка  
36003, вул. Остроградського, 2, м. Полтава, Україна  
<https://orcid.org/0000-0002-9152-2511>

## Формування фахової компетентності вихователя як умова позитивного іміджу закладу дошкільної освіти: огляд літератури

**Анотація.** В умовах воєнного часу українська педагогічна спільнота усвідомлює критичну потребу країни у підготовці кваліфікованих фахівців. Молодь України, незважаючи на складні обставини, бере активну участь у освітньому процесі, спрямованому на виховання та підготовку висококваліфікованих педагогів для закладів дошкільної освіти, що є важливим кроком у протистоянні агресії та забезпеченні майбутнього розвитку держави. Метою статті було обґрунтування важливості формування необхідних компетентностей педагогів для забезпечення якісних освітньо-виховних послуг у закладах дошкільної освіти. Методологія дослідження спиралась на аналіз наукової літератури та порівняння сучасних освітніх практик для визначення ефективних підходів до формування професійних компетентностей педагогів у дошкільній освіті. У статті розкрито поняття «компетентність», схарактеризовано роль вихователя в сучасному освітньому просторі закладу дошкільної освіти. З'ясовано особливості формування позитивного іміджу ЗДО, вплив ефективної взаємодії вихователя і вихованців на засвоєння знань та формування відповідних компетентностей у дітей дошкільного віку. Щоб ефективно реалізувати поставлені завдання, виховати у дітей пізнавальний інтерес, педагогу потрібно володіти фаховими компетентностями, що дозволять належним чином організовувати освітній процес у сучасному ЗДО. Це включає в себе уміння взаємодіяти з іншими педагогічними працівниками, організацію роботи з батьками, моніторинг та оцінку результатів освітньої діяльності дошкільників, використання інноваційних технологій, а також адаптацію до змін у сучасному освітньому середовищі. У статті акцентовано увагу на тому, що в структурі професійної компетентності майбутніх вихователів ЗДО науковці виокремлюють декілька складників: психологічну, теоретичну, технологічну, результативну. Отримані результати можуть використовуватись педагогами для покращення взаємодії з дітьми, організації роботи з батьками та впровадження інноваційних технологій у сучасному освітньому середовищі.

**Ключові слова:** заклад дошкільної освіти; вихователі ЗДО; діти дошкільного віку; професійна діяльність; педагогічна майстерність



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**Yuliia Kulimova\***

PhD in Pedagogical Sciences  
Poltava National V.G. Korolenko Pedagogical University  
36000, 2 Ostrohradskyi Str., Poltava, Ukraine  
<https://orcid.org/0000-0002-1091-6878>

## Improving the speech-communicative competence of future elementary school teachers in the context of digitalisation the higher pedagogical education in Ukraine

**Abstract.** The relevance of the study is stipulated by the growing need to train future primary school teachers who are able to effectively use language and communication skills in the context of digitalisation of education. Given the challenges of modern pedagogical practice in Ukraine, it is important to explore approaches to improving language competence in order to facilitate teachers' adaptation to digital technologies and ensure quality education in the context of rapid changes in the information space. The aim of the study was to conduct a detailed analysis of the peculiarities of forming the linguistic and communicative competence of future primary school teachers, taking into account the current state and potential of the digital sector in Ukraine, as well as the introduction of modern virtual technologies. The study used a number of psychological and pedagogical scientific methods, such as analysis, synthesis, comparison, classification, systematisation and generalisation of information contained in scientific and educational literature on the chosen topic. Based on the generalisation of scientific works, the author proposed a definition of the concept of "linguistic and communicative competence of a future primary school teacher". The features of the digital transformation of higher pedagogical education are determined on the basis of an analysis of the experience of foreign countries (Great Britain, Estonia). The main problems of digitalisation and digital transformation of vocational teacher education in Ukraine were described. The introduction of online training of future primary school teachers was actualised, in particular in the context of improving their linguistic and communicative competence. The article revealed the peculiarities of using a number of educational digital services and platforms (G-suit for Education, Moodle, Classcraft, Learningapps, Coursera, Prometheus and EdEra, etc.) in the context of improving the language and communication competence of future primary school teachers in Ukraine. The results of the study can be used to improve the curricula in pedagogical universities of Ukraine and to improve the quality of teacher training

**Keywords:** primary school teacher; ethical competence; online educational platforms; psychological and pedagogical training; digital services

### INTRODUCTION

Ukrainian higher pedagogical education requires updating and modernising the content of linguistic training of future elementary school teachers and forming their communicative competence in the education process. The relevance of this question is underscored by the fact that the elementary school teachers are standing at the sources of

formation of the younger generation, promote the development of ethical, cultural, and aesthetic values, help to learn and explore the environment and develop the national identity of Ukrainians. However, the quarantine restrictions and imposition of martial law forced the Ukrainian educational community to keenly feel the other side of

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\*Corresponding author



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academic interaction, where live communication and eye contact of the teacher with students was replaced by virtual interaction. Thus, active discussion of actual issues in professional and pedagogical training in lectures and seminars, scientific conferences, and the passing of pedagogical practice have all moved to a digital format. On the one hand, these processes create new opportunities for developing all subjects of education cooperation and, on the other, give rise to numerous complications and unique educational and pedagogical challenges.

The improving speech-communicative competence for future elementary school teachers within the context of digitalisation in Ukrainian higher education has gained increasing importance in recent years. Digital tools and technologies, such as augmented reality and interactive platforms, are now considered essential for fostering pedagogical innovation and enhancing teacher competence. According to recent studies, integrating digital tools into educational practices enables teachers to develop a broader range of communicative skills, including critical thinking, problem-solving, and interactive engagement (Tulkuniy, 2020).

As digitalisation reshapes the educational landscape, it also provides unique opportunities for the development of communicative competence. Research shows that the use of digital platforms in teacher preparation programs helps develop key communication skills by enabling more flexible learning environments and encouraging collaborative work (Tulkuniy, 2020). Specifically, the integration of technologies like digital content creation and augmented reality not only enhances content delivery but also engages students more effectively in learning processes, thus improving their ability to communicate and interact in diverse educational contexts. Furthermore, scholars emphasise the role of digital competence in teacher education, which includes the ability to effectively use digital tools for communication, collaboration, and content delivery. This suggests that, alongside traditional teaching methods, digital technologies are becoming indispensable for future educators, particularly in developing speech-communicative skills that are crucial for effective teaching and fostering student engagement. Thus, understanding how digitalisation influences communicative competence is essential for shaping teacher training in Ukraine (Castañeda & Villar-Onrubia, 2023; Franchuk *et al.*, 2024).

The relevance of these and other issues, considering the current state and potential of the digital sector in Ukraine, has determined the choice of our research topic and purpose. Thus, the purpose of the article was to conduct a detailed analysis of the peculiarities of the process of speech-communicative competence of future elementary school teachers, taking into account the implementation of modern virtual technologies.

## MATERIALS AND METHODS

At the first stage of the research, the focus was on exploring the theoretical and practical foundations for forming

and improving the speech-communicative competence of future elementary school teachers. The study employed a range of theoretical scientific methods, including analysis, synthesis, comparison, classification, systematisation, and generalisation of information sourced from scientific and educational literature. These methods were instrumental in comprehensively understanding the key concepts, principles, and frameworks that define speech-communicative competence in the context of teacher preparation programs. The method of analysis was used to deconstruct complex theoretical constructs into their essential components, providing clarity on the various aspects of speech-communicative competence. Synthesis was then applied to integrate these elements into coherent models, facilitating a more holistic understanding of how these competencies are developed and enhanced. Through comparison, the researcher evaluated different theoretical perspectives, identifying both commonalities and distinctions in existing approaches to developing speech-communicative skills.

Classification and systematisation were employed to organise the wealth of information into logical categories and structures, making it easier to identify relationships between various concepts and principles. This structured approach enabled the researcher to establish a clear framework for understanding the theoretical and practical aspects of speech-communicative competence. Finally, generalisation allowed the extraction of broader trends and universal principles that could inform teacher education practices in diverse contexts. The second stage of the study shifted its focus to the digital transformation of improving speech-communicative competence among future elementary school teachers. At this stage, the same set of theoretical methods was applied, ensuring a consistent and rigorous methodological approach. Analysis was used to examine how digital tools and technologies influence the development of speech-communicative skills, while synthesis integrated these findings into comprehensive theoretical insights.

Comparison was crucial for evaluating the effectiveness of various digital strategies, highlighting innovative approaches and best practices in using technology for teacher training. Classification and systematisation allowed the researcher to categorise and structure information about digital resources and methodologies, creating a systematic understanding of their application in education. Generalisation was used to identify overarching patterns and trends, contributing to a deeper understanding of the role of digital transformation in enhancing speech-communicative competence. By applying these theoretical methods, the research provided a detailed exploration of both the traditional and digital approaches to improving speech-communicative competence. This comprehensive analysis laid the groundwork for practical recommendations aimed at integrating innovative, technology-based solutions into teacher training programs.

## RESULTS AND DISCUSSION

The crucial goal of the modern higher pedagogical school in Ukraine is to train a new generation of professionals who would be highly qualified, media literate, language-competent, mobile, creative, and highly moral people who strive for continuous self-development and self-improvement. In this sense, the development of future elementary school teachers' professional communication skills, and the culture of speech, thinking, and behavior following the characteristics of professional activity is significant. This tendency leads to increased attention to improving the speech-communicative competence of the future specialist. In order to correctly and impartially interpret the conceptual and terminological apparatus of this scientific article, it is possible to appeal to the etymology of the basic concepts of the research.

First, it is essential to note that in the contemporary scientific world, there is a wide range of interpretations of this phenomenon. I. Potiuk (2012) states that communicative competence is the ability to understand and reproduce language not only at the phonological, lexical, grammatical, and local knowledge and speech skills level but also by the various goals and specifics of the communication situation. Other Ukrainian linguists I. Kochan & N. Zakhliupana (2005) think that communicative competence is the ability to understand others and create their utterances of different types, styles, and genres of speech, using verbal and nonverbal means, which involve mastering oral and written communication.

O. Pometun (2004) notes that the professional competence of teachers has formed in the training process and must contain the knowledge, skills, attitudes, and experience of individual behaviors. Also, scientists think that speech-communicative competence consists of a person's ability to communicate in different types of speech activities according to the set of communicative tasks, understand, interpret and generate their statements". In this sense, it is possible to consider it necessary to distinguish between terms such as: *language competence* (is the understanding of the language system and the ability to use it for understanding the speech of others, expressing their opinions orally or in writing); *speech-communicative competence* (the ability to use language as a means of communication in its various areas and different situations); *linguistic and methodical competence* (skill of using the language for professional purposes, to teach the younger generation languages).

Thus, by summarising the scientific concepts of researchers and taking them as a basis, it is possible to formulate the author's view on the *speech-communicative competence of future elementary school teachers* as the ability to be fluent in the Ukrainian language, use linguistic and ethical formulas, professional use of language styles and genres under the actual conditions of professional interaction. In addition, the future teacher should have the skills to perceive, analyse and use information, assess the communicative situation, quickly and effectively make decisions and plan communicative actions with all subjects

of educational cooperation. In this sense, the future elementary school teacher must have a rich vocabulary and speech culture, express one's opinions freely, think critically, analyse, synthesise, classify and evaluate events, navigate the large flow of information, and choose from it the main. Speech-communicative competence is a structural phenomenon that contains specific values, motives, attitudes, socio-psychological stereotypes, knowledge, skills, and abilities. Contemporary Ukrainian scientist Yu. Yatsiuk (2021) defines the following structure of speech-communicative competence of a teacher, which contains: communicative qualities that characterise the presence and development of communicative abilities; possession of initiative in communication, ability to emotionally respond to the state of communication partners, ability to self-activation; knowledge of norms and rules of communication, ethical standards of the pedagogical activity, aesthetic and moral values, cultural traditions, age, intellectual and other characteristics and use of this knowledge in the process of communication; ability to listen and speak (speech culture).

The much broader structural characteristic of the studied phenomenon is found in the Common European Framework of Reference for Languages: Learning, Teaching, Evaluation (2003), which highlights the linguistic, sociolinguistic, and pragmatic components. Each component must allow the specifics of a specialty and contain a set of components (competencies). Thus, the linguistic component of speech-communicative competence characterises "lexical, phonological, syntactic knowledge and skills and other parameters of language as a system regardless of the sociolinguistic significance of its variants and the pragmatic functions of its implementation" (Common European Framework..., 2003). While working on improving this component, students should deepen language knowledge (theoretical information about the language, structure of the language system, rules, and regulations), expand the vocabulary and accuracy of its use, and the ability to correlate language with the purpose and conditions of communication, to understand the use of synonyms, homonyms, and paronyms, etc (Horoshkina, 2012).

The sociolinguistic component "applies to the socio-cultural conditions of language use, which involves mastering socio-ethical conventions (rules of courtesy, norms which regulate the relations between generations, sexes, classes, and social groups)" (Common European Framework..., 2003), cultural-historical and national-linguistic environment of the region, conscious attitude to language as a value. The pragmatic component is related to the practical use of linguistic means: the production of language functions, acts of speech, etc (Common European Framework..., 2003). This component involves the formation of future elementary school teachers' ability and willingness to effectively communicate with all subjects of educational cooperation per the professional conditions and variety of situations. The proper level of speech-communicative competence of future specialists is a holistic,



integral quality of personality. The components are dynamically combined, thus making it possible to perform a specific task and professional responsibilities competently. While the speech of an elementary school teacher is one of the main tools of psychological, pedagogical, and educational influence, it is determined by the level of one's communicative qualities. Therefore, it performs the set of the following functions: *communicative* (responsible for establishing and regulating educational relationships); *psychological* (contributes to the creation of conditions to ensure the psychological freedom of all participants in educational cooperation, the manifestation of their identity); *cognitive* (provides a whole perception of educational information, the formation of students' personal, emotional, and value attitude to learning); *organisational* (helps to rationally organise future elementary school teachers' educational and practical activities) (Yatsiuk, 2021).

While considering these functions, it is essential to note that, in the context of improving the speech-communicative competence of future elementary school teachers in the context of digitalisation of education, a lecturer's speech is one of the primary means of organising virtual learning. Therefore, the oral speech of a teacher of pedagogical higher education should consort with the specific pedagogical situation and take into account such properties of sound speech as timbre, volume, tempo rhythm, modulation of the teacher's voice, intonation, "body language" (gestures, facial expressions, looks), lecture style, etc. Evidence-based confirmation of represented opinion is found in V. German (2018), who notes that non-verbal means provide 60 to 80% of communication. The process of communication is 55-65% non-verbal (7% are verbal (words and phrases), 38% – are vocal (intonation, tone of voice, other sounds), and most information (55%) is transmitted nonverbally). Through these tools, students get the necessary educational information, form their pedagogical worldview, the desire to realise future professional activity, and more. It is possible to characterise some elements of the speaker's sound speech, which are worth paying attention to improve the speech-communicative competence of future elementary school teachers.

The *clear proclamation of the text* plays an essential role in students' perception of educational content. It is known that human speech is most expressive in everyday life or informal conversation; that is why the lecturer should try to transfer one's eloquence to the lectures. According to O. Prokhorenko-Duchenko (2015), unique expression is achieved due to intonations, changes in rhythm, spectacular pauses, construction of expressions, changes in pitch and timbre of the voice, etc. However, it is critically important that any expression is natural, so theatricality and artificiality in speech should be avoided.

A pause is one clear sound that influences the lecturer's listeners. Pauses are divided into breathing (in order to gain air), logic (to reflect the structure of the lecture and punctuation), and psychological (to draw the attention of students or prepare them for a certain crucial point).

Psychological pauses are often used during the transition from one thought to another or to emphasise a thought. Nevertheless, the lecturer should avoid unjustified pauses that complicate the perception of words.

The correct perception of the teacher's speech depends on the *tempo of its utterance* (the speed at which sounds, syllables, or words are pronounced per unit time). If the lecturer chooses too fast or too slow a tempo, there is a high probability that students will stop listening to him. Modern scholars note (Prokhorenko-Duchenko, 2015) that when a speaker speaks too fast, communicators lose the essence of the conversation. However, if too slow – the communicator is ahead in the perception of information, and the effect is the same: interest in words is lost. It is recommended to pronounce the most important parts of the lecture at a slower tempo and provide secondary information faster. For convenience, the teacher can mark the speed of proclamation of certain parts of speech in the text of a lecture.

It is also worth thinking about the *timbre of the voice*, which is individual, like a pattern of skin on the fingers. It helps to identify different voices by hearing (Prokhorenko-Duchenko, 2015). If necessary, one can learn to change the timbre to beautify the speech, draw the listeners' attention to some aspects of the speech, outline important nuances of communication, and more. Thus, the process of improving the speech-communicative competence of future elementary school teachers should take place in the context of new requirements. This scientific phenomenon can be considered a critical educational and professional competence, which should include practical work on the voice, diction, intonation, volume, timbre, and tempo of speech. Such professional and pedagogical activity will help students master the skills and abilities to organise and conduct educational interactions in future activities professionally. The current stage of Ukrainian education is characterised by the intensification of large-scale transformations caused by changing the knowledge and information paradigm and the active involvement of educational systems in global processes of information and technologicalising. Thus, the digital transformation of Ukrainian education is an inevitable process, which leads to the need for rapid and scientifically based changes in the content and methods of professional and pedagogical training.

A professional organisation to improve the speech-communicative competence of future elementary school teachers is impossible without the modern advances in information and communication technologies. The current situation of the educational sphere in Ukraine is complicated not only by the consequences of the COVID-2019 epidemic but also by the imposition of martial law, which provides the organisation of the educational process in extreme conditions. Therefore, using digital technologies in the context of professional teacher training in Ukraine is the only solution to outlined problems.

The development of digital education in Ukraine is one of the main areas of the Digital Agenda for Europe (2017).

These tendencies create a fertile background for implementing e-learning and IT technologies practically. According to the WEF-2017 “Global Report on Information Technology”, WEF Networked Readiness Index (NRI) describes Ukraine as a state in which the NRI allows to estimate driving factors and consequences of achievement of a certain degree of network readiness and mobilisation of digital technologies (Zhernovnykova, 2018). Therefore, the digitisation of higher pedagogical education involves creating detailed information and an educational environment in which the teacher becomes the coordinator of online platforms and academic trajectories. However, the main problem of implementation of Ukrainian state policy in stimulating the development of digital technology in education is fragmented, lack of systematic succession and completeness, which requires further development of mechanisms for its implementation.

Among the challenges mentioned above, the need for digitalisation of education is highlighted: “becoming the main trend of our time and radically transforming the essential characteristics of educational processes, because it is impossible to stay out of digital transformation” (Berbeniuk, 2019). In this regard, an essential task for higher pedagogical establishment is an acceleration of involvement in the digital transformation processes of future teachers’ training and the need to organise e-learning. *E-learning* is defined as “distance learning, supported and stimulated through information and communication technologies (ICT)” (Tsidylo, 2011). The process of E-learning in terms of higher education environments is based on the learning management system (LMS) – “learning management systems used for the development, management, and distribution of online training materials on software sharing, are placed in an educational environment” (Vakaliuk, 2016). Therefore, the relevant question is to analyse theoretical and practical research in the digitalisation of higher pedagogical education.

Paying tribute to mentioned works, it is possible to note that the problem of organising the process of improving the speech-communicative competence of future elementary school teachers in the digitalisation of Ukrainian education is not illuminated and needs revision. It is possible to make a statement that quite helpful is the experience of foreign countries in which digitalisation and informatisation of education, including pedagogical vocational teaching, were introduced much earlier and had rapid development than in Ukraine. In particular, according to BBC News (2014), in Great Britain, in 2015, the mandatory study of programming and information technology for children aged 5 to 16 was introduced. That is, public policy in education has long made significant efforts to shape the digital literacy of its citizens, starting from elementary school.

In the countries of the European Union in 2014, The Education Development Strategy was adopted, which envisages the transition to digital technologies by 2020. The primary reason for such a tendency was seen in the significant achievements in the area of information and

communication technologies and the desire to integrate them into the activities of educational institutions. As remarked by the modern Ukrainian scientists A.M. Chaika & V.M. Shyshak (2021), quite interesting is the Estonian experience in which all social processes, including education, are digitised, and the country, the results of PISA, in 2018 entered the top ten most prosperous countries (PISA 2018: Estonia..., 2020). In Estonia, in 2008, eKool – an information system containing all the data related to the study process, in which the interaction of educational participants (students, parents, teachers, and administration). In this system, one can enter / view grades, keep/view attendance records, post, and complete homework, evaluate student behavior, and communicate with each other.

The process of digitising the educational environment in Ukraine is currently in a state of development. Nowadays, with organised online access to educational information and various courses, there is an opportunity to learn using online sources to integrate various educational materials industries and quickly acquire the required additional knowledge (Chaika & Shyshak, 2021). However, with the beginning of the pandemic in Ukraine in 2020, the main issue was the organisation of quality educational services in the distance format. Since February 2022, with the introduction of martial law in Ukraine, the problem has become even more urgent. Any process of building something new, like digitisation and digital transformation of Education in Ukraine, has several problems. In particular (Chaika & Shyshak, 2021):

- limited number of high-quality Ukrainian professionally-oriented digital content: in the online space is much information, but it often is not scientific scrutiny and demands thorough inspection;

- high costs of personal resources: mastering the features of working with online services takes a long time. The profession of an elementary school teacher is quite versatile because, in addition to organising educational work, one should be able to communicate with parents and the closest family environment of pupils, conduct educational activities, establish cooperation with other participants in educational interaction, and all this one should be able to do offline and online;

- orientation of virtual professional education on the content of education and some extent leveling the need for speech-communicative development of future teachers: the transition to digital communication and learning has led to the need to spend much more time (online classes, searching for new information, doing the practical tasks, examination assessment, etc.), which significantly changes the vectors of professional education from active-communicative educational cooperation to the passive perception of professional content;

- lack of systematic legal, regulatory framework, and educational materials on digitising high pedagogical education. Although the digital transformation of the public areas started long ago, Education in Ukraine has taken only the first steps toward its implementation. This thesis

is confirmed by the fact that the online teaching materials are mainly amateur and not scientific.

Despite these difficulties, the introduction of online training for elementary school teachers, particularly in improving their speech-communicative competence, creates favorable conditions for solving several significant professional and educational problems. First of all, it is essential to provide an open access to a variety of educational resources; obtaining special education in a convenient form; intensification of professional education; developing of creative and intellectual abilities of students by employing virtual educational resources; data exchange, communication activities based on shared interests, mainly educational and professional, etc (Smyrnova-Trybulska, 2007).

Among the large variety of available specialised online systems management education and educational content, higher educational institutions in Ukraine use different LMS systems (Learning Management Systems) and LCMS systems (Learning Content Management Systems). In particular, Poltava National V. Korolenko Pedagogical University uses complex services Digital G-suit for Education (since 2021, renamed Google Workspace for Education) and Moodle. It is possible to characterize the possibilities of its implementation in improving the speech-communicative competence of future elementary school teachers.

*G-suit for education* provides diversified opportunities for digital services (Gmail, Drive, Classroom, Google Meet, Jamboard, Google Sites, etc.). These options have significant advantages, while feint compared to other virtual E-environments: increasing the level of information security; the possibility of centralised generation of accounts for students and educators, determining the rights to use existing cloud services, etc.; increasing the number of available online services appropriate for remote interaction between participants in educational activities, in particular; empowerment of virtual services: Google Drive has no restrictions on disk space; Google Sites places the developed resources in the domain of the educational institution; Google Forms used to conduct computer-based testing is only available to users from the university's domain; Google Meet offers video calling, etc (Hrabovskiy, 2021).

Highlight the main ways of implementing G-suit for Education digital services in line with current study. Thus, *Google Classroom* should be used to implement asynchronous remote interaction between teachers and students. This service allows one to perform a wide range of educational operations: post general information on the subject and features of the organisation of joint work (names of topics, number of hours, forms of work, deadlines, etc.); add additional educational content (videos or links on relevant Internet resources, samples of finished students works, etc.); publish general announcements and student assessments; conduct group surveys, final testing (using Google Forms) with the ability to import the received grades; organise a synchronous mode of remote interaction with students through integrated into each classroom constant link to Google Meet, etc.

On the Google-drive, each course contains all necessary materials saved in Google Docs: lectures, guidelines for laboratory work and independent work, the question for ultimate control, and samples of student work. During the course, students get acquainted with all the teaching materials, which have a speech-communicative and pedagogical direction: creating infographics on a particular theme (using cloud services Piktochart, Google Charts, Canva, etc.); preparing educational web-quests (mainly through Scratch service) or smart maps for mind-mapping technology (in group and individual forms), developing e-portfolios (using web-application Google Sites) and others.

Virtual service Google Sites can be used as a virtual diary, forum, electronic students' portfolio, course portfolio, and others. Thus, a convenient option for implementing this application in the educational process of higher educational establishments is developing an electronic teaching textbook with speech-communicative issues. These e-manuals should contain all necessary materials to improve the speech-communicative competence of future elementary school teachers, namely multimedia lectures (created with the help of online services Canva or Google Slides), guidelines for practical classes and students' independent work, questions for final control and useful links to videos (posted on YouTube).

Using these services sufficiently facilitates the perception of teaching and learning material, increases students' interest in disciplines, and optimises the preparation and implementation of practical tasks. Google Calendar helps organise and plan the educational work. Using the capabilities of this service allows one to plan interactions with students and helps create an environment for joint educational activities through the publication of webinar schedules, deadlines for tasks, reminders about important dates, etc. In the context of improving the speech-communicative competence of future elementary school teachers, an essential role in the implementation of online services G-suit for Education is attributed to the following educational objectives: to evaluate and prove the truth or falsity of statements, conclusions, judgments, and conclusions classmates during educational online chat; to develop an example of online teacher interviews, reporting the exciting facts that motivate students to study a particular topic; to develop a problematic communicative situation with options for its solution and present it in the online test format; to develop an example of an educational conversation with students; to develop a conversation-explanation: what teachers' mistakes in communication are rude and not rude (in the form of infographics).

Another cloud environment that can effectively coordinate educational interaction in a high pedagogical establishment is *Moodle* (Modular Object-Oriented Dynamic Learning Environment). Moodle includes a variety of educational elements (so-called "modules") that provide dialogue and cooperation between teachers and students (What is Moodle, 2022). Just as a G-suit for Education, in Moodle, teachers can choose any modules, post them on



the site, edit, update, and use them for information, learning, and student assessment. The platform allows the use of the forums, monitoring the students' activities, contains an easy-to-use electronic journal of grades, and provides convenient content management tools and various forms of organisation of classes. Distance courses can contain different elements: lectures, practical assignments, chat, and more. It is possible to use text, presentations, spreadsheets, charts, graphics, videos, links on the internet, files, and other supporting materials. According to the results of the student task, the teacher can assess and give comments. The learning management system of Moodle has many features that facilitate the evaluation of students' knowledge. Control of knowledge is in the system using a single module that offers many types of tests allowing re-testing with permission of the teacher, the ability to protect against cheating by randomization for a test organisation database of questions for use in tests. Therefore, the online platform Moodle has enhanced interactivity among participants in the educational process, helping the organisation as successful distance education students. Possible formats of implementing the digital system of Moodle, in the context of speech-communicative issues, maybe such educational objectives for future elementary school teachers:

- ▶ to develop the content of the heuristic conversation in the form of an online questionnaire and suggest different ways to solve the problem situation;
- ▶ to develop an algorithm to perform a behavior of the teacher in the form of infographics, based on the analysis of the communicative activity of a person (after watching a video history);
- ▶ to develop options for wording issues in the form educational forum preceding the study of new material;
- ▶ to simulate the communicative situation in the form of an online token, with proper and improper behavior of teachers;
- ▶ to simulate the problem situation and solve it during online classes;
- ▶ to develop the content of online group discussions during which participants could have the opportunity to express, justify and convince of the correctness of their own opinion.

Based on current global trends, pedagogically appropriate is to use gamification's educational and scientific potential. Gamification allows a gradual immersion of students in the learning, provides measurable feedback, and provides dynamic adjustment of verbal behaviour (Sharples *et al.*, 2002). According to data from the journal *Forbes*, gamification is one of the five major trends in modern education and has tremendous potential in the organisation of the educational space (Levyn, 2012). In compliance with the work "Moving learning games forward" by E. Klopfer *et al.* (2009), which was done at MIT, online games in educational institutions should be used as follows: the themed games that contain knowledge of a particular course. For example, students gain some knowledge on the subject "Ethics and psychology of teacher communication"

by playing a game, where they can test their knowledge through game practice; the game simulations should be used to test some pedagogical communication rules, analyse the practical situation, and put thought experiments. For example, students receive a systematic understanding of ethical and speech challenges of the elementary school teachers in distance learning, playing games, they can learn how to solve them; the game platform to create something new (like a specific model of teaching situation). For example, students create a visualisation of specific teaching situations with different behaviors of teachers and students. This format helps to develop the skills of teamwork, leadership, communication, management, etc.

Here are examples of online gaming platforms where teachers can create online educational games for future elementary school teachers to develop their speech-communicative competence. One of the almost free gaming platforms is *Classcraft*. It is a command-role online game with modern graphics and great educational functionality. Its interface can be configured in English or French (but using the automatic translation application Google, the platform can be adapted in Ukrainian). Each player chooses a character (magician, warrior, sorcerer) while studying a particular topic and can unite in teams and compete with other players. All educational and developmental processes are transferred to the game environment; each student's education and personal successes and failures are inevitably reflected in one's character and the ranking of different types of points. The positive aspect is that *Classcraft* allows one to integrate all Google applications (including Google Classroom), which can be an excellent motivator for the professional training of future elementary school teachers, improving their digital and speech-communicative competence. Another great free multilingual online games designer is *Learning apps*. Using it to create interactive game tasks from any discipline, select a template and enter its tasks. Combining individual blocks can create interactive tasks for students through quizzes, puzzles, games, races, timelines, interactive images, and more. Also, collaborative teachers and students are available for group chats, polls, calendars, notes, and message boards (Nalyvaiko, 2022). Thus, gamification is an interactive method of modern educational teacher training, allowing students to act in different roles (scientist, inventor, teacher, parent, or pupil), set goals, make choices, and assess consequences. This format enables the sense of freedom of choice, that is, the ability to influence the situation in both virtual and natural pedagogical environments. Another effective way for future elementary school teachers to train in the digitalisation of study is by using different learning platforms to improve speech and communication skills, self-education, and self-development (Platforms for improving..., 2022). It pertains to:

*Coursera* – is an online platform with more than two thousand courses from more than 180 specializations at four educational levels. Some courses have Ukrainian subtitles. In case of successful completion of each course, the user receives a certificate. During the study, students must

review the lectures sent to them every week, read recommended articles and do homework. From the standpoint of improving the speech-communicative competence of students, the high rate of interest is attributed to the following courses, which can be taken for free: “Transmedia storytelling: Narrative worlds, emerging technologies, and global audiences,” “The language of design: form and meaning”, “Intellectual humility: Theory”, “Know thyself – the value and limits of self-knowledge: The unconscious” and others.

*Prometheus* – is a Ukrainian free online education platform that includes courses with themed video lectures, interactive tasks, and a forum where students can ask teachers and communicate. Successful course completion allows one to get an electronic certificate verifying acquired knowledge. From the standpoint of this research, it is essential to pay attention to the following educational courses: “Information hygiene. How to recognise lies on social networks, on the internet and television”, “Think differently: break the barriers to learning and discover your hidden potential”, “Successful teaching – simple recipes for everyday life”, “Secrets of successful school directors”, “Culture of tolerance: how to build a society comfortable for all”, “Scientific communication in the digital age”, “How to plan and conduct dialogue effectively,” “Dialogue and mediation: The road to understanding,” “Learning science: What has to know every teacher?”, “Media literacy for educators”, etc.

*EdEra* – is a free educational project that aims to study Ukraine's quality and affordability. Each lecture (short videos, questions, and challenges for better absorption of the material) attached accompanying material – a compendium of illustrations and explanations. Each week, students complete homework and pass an exam at the end of the course. After successful passing of final control, the students receive a certificate. In the context of speech-communicative development of future elementary school teachers is the expedient passage of such courses on this digital platform: “Online course for elementary school teachers”, “Online course for teachers and school leaders about the distance learning”, “About school for teachers”, “Ukrainian language. From phonetics to morphology”, “Elementary school teachers work with children with special needs”, “Faktchek: trust-verify”, “Key skills of the 21<sup>st</sup> century” and others.

Thus, the critical role of professional training of future elementary school teachers, particularly in improving their speech-communicative competence, occupies the digital online technologies. The implementation of virtual services contributes to the development of the creative and intellectual abilities of students, establishing effective communication in a digital educational environment. The main ways to solve these problems are to use online platforms' educational and developmental potential, such as G-suit for Education, Moodle, Classcraft, Learningapps, Coursera, Prometheus, EdEra, and others. Systematic and professionally organised use of these virtual services will allow the development of critical and creative thinking of

future specialists, active involvement in the learning process and cognitive motivations for using online services, and the formation of the desire for professional growth in the speech-communicative field in order to master a high level of digital and speech literacy.

## CONCLUSIONS

Based on the analysis of scientific literature, it is possible to define speech-communicative competence of future elementary school teachers as the ability to master their native language perfectly, be able to use the language and the ethical formulas according to the actual conditions of professional interaction, perceive, analyse and use the information of pedagogical direction, assess the communicative situation, quickly and effectively make decisions and plan communicative actions with all subjects of educational cooperation.

An essential element of speech-communicative competence of future elementary school teachers is language and speech etiquette. These concepts demonstrate the state of the speech culture of young professionals, one's spiritual values, ethical orientations, and type of behavior in various psychological and educational situations. Speech etiquette of a teacher is also a cultural landscape of the Ukrainian people, so it is essential to shape the ethical competence of elementary school teachers to develop moral, spiritual, emotional, volitional, speech, and communicative skills in them. Digitalising these processes aims to actively use higher teaching institutions in Ukraine's LMS and LCMS systems. Using the experience of Poltava National V.G. Korolenko Pedagogical University, it is worth noting the value and necessity of applying the online educational system G-suit for Education and Moodle, virtual gaming Learningapps and Classcraft services, online education platform Coursera, Prometheus, and EdEra and others. Implementing these digital educational applications promotes students' creative and intellectual abilities and the critical and creative thinking of future specialists to establish effective communication, active involvement in the learning process, and future professional activities.

Future research could explore the integration of advanced digital tools, such as AI-driven platforms and virtual reality, to further enhance the speech-communicative competence of future elementary school teachers. Additionally, comparative studies between different educational systems could provide insights into best practices for implementing digitalization in teacher training programs globally.

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## CONFLICT OF INTEREST

None.

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**Юлія Кулімова**

Кандидат педагогічних наук

Полтавський національний педагогічний університет імені В.Г. Короленка

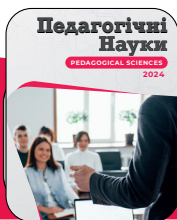
36000, вул. Остроградського, 2, м. Полтава, Україна

<https://orcid.org/0000-0002-1091-6878>**Удосконалення мовно-комунікативної компетентності  
майбутніх учителів початкової школи  
в умовах діджиталізації вищої педагогічної освіти в Україні**

**Анотація.** Актуальність дослідження зумовлена зростаючою потребою в підготовці майбутніх учителів початкової школи, здатних ефективно застосовувати мовно-комунікативні навички в умовах діджиталізації освіти. З огляду на виклики сучасної педагогічної практики в Україні, важливо дослідити підходи до вдосконалення мовної компетентності, щоб сприяти адаптації викладачів до цифрових технологій та забезпечити якісну освіту в умовах швидких змін інформаційного простору. Метою дослідження було проведення детального аналізу особливостей формування мовно-комунікативної компетентності майбутніх учителів початкової школи з урахуванням поточного стану та потенціалу цифрового сектору в Україні, а також впровадження сучасних віртуальних технологій. В роботі використано низку психолого-педагогічних наукових методів, як аналіз, синтез, порівняння, класифікація, систематизація та узагальнення інформації, яка міститься в науковій та навчальній літературі з обраної тематики. На основі узагальнення наукових праць автором запропоновано визначення поняття «мовно-комунікативна компетентність майбутнього вчителя початкової школи». Визначено особливості цифрової трансформації вищої педагогічної освіти на основі аналізу досвіду іноземних держав (Великобританія, Естонія). Описано основні проблеми діджиталізації та цифрової трансформації професійно-педагогічної освіти в Україні. Актуалізовано запровадження онлайн підготовки майбутніх учителів початкової школи, зокрема у контексті удосконалення їх мовно-комунікативної компетентності. У статті розкрито особливості використання низки освітніх діджитал сервісів та платформ (G-suit for Education, Moodle, Classcraft, Learningapps, Coursera, Prometheus та EdEra та ін.) у контексті удосконалення мовно-комунікативної компетентності майбутніх учителів початкової школи в Україні. Результати дослідження можуть бути використані для вдосконалення навчальних програм у педагогічних вузах України та підвищення якості професійної підготовки вчителів

**Ключові слова:** вчитель початкової школи; етична компетентність; освітні онлайн платформи; психолого-педагогічна підготовка; цифрові сервіси





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### **Tamara Denysovets\***

PhD in Pedagogical Sciences, Associate Professor  
Poltava V.G. Korolenko National Pedagogical University  
36000, 2 Ostrogradskyi Str., Poltava, Ukraine  
<https://orcid.org/0000-0002-4927-6783>

### **Iryna Denysovets**

PhD in Philological Sciences, Associate Professor  
National University "Yuri Kondratyuk Poltava Polytechnic"  
36011, 24 Pershotravneva Ave., Poltava, Ukraine  
<https://orcid.org/0000-0002-1424-1652>

### **Olha Kvak**

PhD in Biological Sciences, Associate Professor  
Poltava V.G. Korolenko National Pedagogical University  
36000, 2 Ostrogradskyi Str., Poltava, Ukraine  
<https://orcid.org/0000-0002-3787-3433>

### **Oksana Danyko**

Doctor of Pedagogical Sciences, Associate Professor  
Poltava V.G. Korolenko National Pedagogical University  
36000, 2 Ostrogradskyi Str., Poltava, Ukraine  
<https://orcid.org/0000-0003-4040-562X>

## **Assessment of the efficiency of the application of modern health technologies in the educational process of high schools**

**Abstract.** The health problem of student youth is exacerbated by unfavourable political, social, economic, and environmental factors and is driven by the growing need to maintain students' health. The solution to this problem lies in the idea of creating, substantiating, and implementing innovative health technologies into the educational process of higher education institutions. The study aimed to investigate the features of using hardening in the educational process of a higher education institution as an innovative health technology and to determine its effectiveness. The study involved 50 first-year students of the Faculty of History and Geography at Poltava National Pedagogical University named after V.G. Korolenko, aged 17 to 20 years. It was found that only 37% of students are engaged in regular physical activity. A significant percentage of young people who do not engage in physical education and sports (74%) suffer from minor health deviations in the cardiovascular and respiratory systems, colds, and musculoskeletal disorders; 57% lead a sedentary lifestyle, which leads to weight gain. It was discovered that students recognise the positive impact of hardening on health but do not use hardening methods sufficiently or regularly. The main reasons for the irregular use of hardening activities are a lack of time and insufficient motivation. The effectiveness of the hardening technology was substantiated and experimentally proven, which included, in addition to physical education classes at the university, involving students in health groups, using pool sessions, sauna visits with contrast showers, the duration of which gradually increased, as well as independent activities at home (air baths, mouth rinsing with cool

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\*Corresponding author



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water, neck rubbing with a cool towel, walking barefoot). The results can be used in higher education institutions to improve the physical and mental health of student youth, enhance the functional state and adaptive capabilities of the body, increase resistance to diseases, and normalise body weight, thereby contributing to their academic success and overall quality of life

**Keywords:** health; hardening of the body; physical culture and health technologies; hardening measures; people who get health insurance

## INTRODUCTION

A healthy population is important for economic growth, social stability, and national security of the state. Therefore, human health in the leading countries of the world is a basic resource and driving force for the functioning of society. Healthy people are more productive, in demand, and more actively participate in public life. Conversely, poor health can lead to a decrease in the productivity and social activity of the population. In recent years, there has been an alarming trend of deterioration in the health of the younger generation. Environmental pollution, a decrease in the quality of life, exposure to chemicals, bad habits, increasing emotional tension in society, and the military conflict in Ukraine – these factors negatively affect the health of children and adolescents.

At the current stage, the leitmotif of the entire education system is that it is in a state of constant renewal, taking into account the trends of globalisation, informatisation, and digitalisation of all social relations; that is, it requires a transformation of thinking and innovative approaches and actions of each teacher. The New Ukrainian School is faced with the task of revising and updating health-improving methods and technologies for their application. The stated idea can be implemented only through a harmonious combination of the achievements of classical theory and methodology with innovative approaches to increasing the creative activity and social interaction of students during training sessions with the aim of their further implementation in practical activities. Among the main areas of modernisation of the content of education is the creation and introduction of innovative technologies for the prevention and strengthening of the health of participants in the educational process. The use of the concept of “technology” in the field of education and the pedagogical process is due to the wide implementation of the technological approach, which opens up new promising opportunities. The technological approach in education provides for accurate instrumental management of the pedagogical process and guaranteed achievement of defined educational goals. In the context of consideration of issues of the technologisation of the learning process, the statement of O. Pehota (2022) about the psychological and valeological validity and instructiveness of the learning process acquires special value, that is, any technology should be based on the strategic tasks of modern education – namely, increasing the effectiveness of the pedagogical process and ensuring

appropriate conditions for the development of the child’s personality and formation and improvement of her health in innovative educational spaces.

In the conditions of the innovative development of the post-modern society, the question of the practical readiness of future teachers for the implementation of health technologies in the educational process of the higher school became acute. The analysis of recent publications allows to assert that the issue of using innovative technologies for the formation and preservation of health has found its reflection in many educational technologies aimed at the development and improvement of the educational process and the training of specialists for professional activities in various spheres of life in modern society (Radionova & Lohvinova, 2023). Researchers B. Mamurov *et al.* (2020) emphasise the importance of forming a healthy lifestyle and popularising physical culture and sports among young people. This, in their opinion, should be facilitated by the introduction into the educational and professional programs of higher education institutions of measures to popularise a healthy lifestyle and the formation of theoretical knowledge and practical skills of its organisation, ensuring the motor activity of students, as well as increasing the competence of teachers in these matters.

Scientists G. Griban *et al.* (2021) in the course of an experimental study proved that the health of student youth is ensured by the formation of a motivated value attitude to a healthy lifestyle, adequate nutrition, a sufficient level of physical activity and physical education, compliance with sanitary and hygienic norms, the formation of health care skills, and abilities to design a health-forming environment in further professional activity. Scientists G. Griban *et al.* (2023) emphasise the need for the development of innovative competence in the process of methodical and self-educational activities as the basis for the development of individual health-preserving competence of students – future teachers, their orientation towards active physical culture and physical culture and health work.

Of great interest are the works in which the results of the systematised, classified, and generalised innovative experience are presented, which contributes to the wide familiarisation of teachers with educational innovations and their informed choice: the ability to evaluate self-development, self-improvement, learn emotional self-regulation (Mikheienko *et al.*, 2022); the ability to choose effective ways, means, methods, techniques and forms

of motor activity and disease prevention, which should contribute to constant physical improvement, maintaining a healthy lifestyle, self-knowledge, development of physical qualities, formation of special abilities and skills, development of creative potential of students of education (Wintle, 2022). Maintaining the functional state of the body, increasing the level of motor readiness of students is highlighted in the work by K. Pronenko *et al.* (2020); giving up bad habits, maintaining a rational lifestyle (Wang & Bíró, 2021); the use of digital health technologies (Chatterjee *et al.*, 2021). According to the analysis of the scientific literature, modern technologies are mostly aimed at the formation of a culture of health by increasing theoretical awareness, improving their functional state by means of health-improving physical culture, such as dance and strength fitness exercises, updated programs of cyclical sports (health-improving walking and running, swimming), non-traditional types of motor activity and sports (yoga, Pilates, Frisbee, etc.). At the same time, in the system of professional training of pedagogical staff in institutions of higher education, the problem of forming knowledge, skills, and abilities to prevent, preserve, and strengthen the health of both students and future teachers currently needs improvement. Issues of integration into the system of educational and physical culture and health activities with students of various specialties of hardening technology and substantiation of their effectiveness remain outside the attention of modern researchers. The purpose of the study was to analyse the use of health technologies and the effectiveness of their application in the educational process of higher education institutions. Objectives of the study:

1. Carry out an analysis of the use of health-improving methods in the educational process of higher education.
2. To reveal the effectiveness of technologies when using health-improving techniques.
3. To develop recommendations for enhancing the effectiveness of modern wellness technologies in education.

## MATERIALS AND METHODS

The study was conducted at the Poltava V.G. Korolenko National Pedagogical University in 2022-2023. 50 students (32 boys and 18 girls) of the first year of the Faculty of History and Geography aged 17 to 20 were examined. A questionnaire was conducted to assess the state of formation of a healthy lifestyle of students of higher education institutions (state of involvement of students in physical culture and sports, state of their physical health - susceptibility to diseases, somatic state). The original online questionnaire was compiled together with the curators and scientific and pedagogical staff of the Faculty of Physical Education and Sports in order to find out the quantitative indicator (in percentage) of applicants who play sports and would like to start body hardening procedures. The online questionnaire, created using the Google Forms tool and taking into account all the requirements for sociological research, consisted of 11 closed and open questions. The online questionnaire contained three thematic blocks of questions:

general information about the participants – age, gender, physical education and sports (block I), information about the state of health of students – the presence of abnormalities in the work of body systems and susceptibility to diseases (block II), knowledge and attitude of applicants to health hardening procedures – knowledge and practical use of hardening agents and motivation for hardening procedures (block III). Applicants were warned about the purpose of the questionnaire and participated in the study voluntarily. A total of 50 questionnaires were processed. A quantitative method was used to calculate respondents' answers. All provisions of the Declaration of Helsinki (2013) were followed during the study.

Data on the level of morbidity among students was clarified with the help of the following analysis of documentary materials (medical cards of students), which were reviewed at the beginning and at the end of the study with the involvement of a medical worker of a higher education institution and allowed to reveal the dynamics of disease cases. The dynamics of anthropometric indicators (height and weight) of students were tested for functional indicators using the Body Mass Index (BMI) method and using a height meter and electronic scales. Body mass index was calculated for each participant according to the formula:

$$BMI = \frac{\text{body mass (kg)}}{(\text{height m})^2}. \quad (1)$$

Determination of normative indicators was carried out in accordance with WHO recommendations (World Health Organisation, 1995). According to the results of the questionnaire and the analysis of documentary materials, a pedagogical experiment was developed and organised regarding the use of health-improving methods and the effectiveness of their technologies in the professional activity of a teacher of a higher education institution. The pedagogical experiment took place in three stages with different orientations and durations. At the first stage, the peculiarities of the organisation of the educational and movement mode were considered and analysed. Based on the analysis and generalisation of psychological-pedagogical and scientific-methodical literature, pedagogical observation, the means and methods that can be used to improve the health and functional state of students were studied. Together with this, the goals and objectives of the research were formulated and specified, and the methods of pedagogical control were determined. At the second stage, the composition of the control and experimental groups was determined. The composition was determined by selecting a group of students, who used to play sports. Each group consisted of 10 people. At the third stage, the author's method of hardening the students of the experimental group was implemented, and its effectiveness was investigated.

In order to conduct a pedagogical experiment based on the theoretical analysis of specialised and scientific-pedagogical literature, a methodology aimed at hardening the body of education seekers. It was used in the experimental



group (hereinafter – EG). The control group (hereinafter – CG) was engaged in the program of the discipline “Physical culture”, consisting of boys and girls. Students of the control group took part only in the mandatory form of physical exercises – physical culture pairs twice a week. Students of the experimental group, in addition to physical culture classes at the university, attended health group classes and used various hardening agents. All students who participated in the study were engaged in physical culture twice a week. In EG, one lesson was replaced by a lesson in the swimming pool. Aquatic activity included recreational swimming and (or) performing physical exercises in water. In addition to EG, at the end of the week, a session in the health group was added, which included a visit to the sauna. The duration of stay in the sauna is 7-10 minutes, followed by a contrast shower. Also during the week they were given recommendations on hardening at home. During the week, students took air baths lasting 10-20 minutes. It is recommended to carry out hardening of the nasopharynx in the form of rinsing the oral cavity with cool water and wiping the throat with a cool towel at home. In addition to the above, walking barefoot in the house was recommended. Every week, the time of acceptance of hardening procedures was added to the experiment. Thus, by the end of the experiment, the duration of water hardening was 20 minutes, the duration of visiting the sauna was 10 minutes, followed by a contrast shower, and the duration was 15 minutes. The duration of air hardening at the end of the experiment was 40 minutes of students being in the fresh air. The data obtained during the experiment were subjected to quantitative and qualitative analysis. Mathematical statistics methods were used to determine the effectiveness of the developed methodology.

## RESULTS

For a thorough analysis of the outlined problem, the state of the students' involvement in physical culture and sports, the state of their physical health (susceptibility to diseases, somatic condition) and the dynamics of students' anthropometric indicators were determined. Based on the results of the survey, it was found that out of the number of respondents, the percentage of students engaged in sports was 37%. Among those who do not regularly play sports – 63%, there is a high percentage of colds – 74%, and minor deviations in the work of the cardiovascular and respiratory systems, as well as disorders of the musculoskeletal system. At the same time, there is a percentage of students who suffer from excessive body weight – 57%. Analysing the obtained results, we state that the problematic situation is manifested in the fact that a fairly large percentage of young people suffer from minor deviations in their health from the cardiovascular system, the immune system, this can be said by the fact that a large percentage of them often suffer from cold diseases. Only 20% of respondents are engaged in hardening measures. Out of the total number of respondents, 78% of respondents indicated that they would like to start tempering classes. The students

answered the first question of the third block of the questionnaire “Which factors, in your opinion, are the most important for maintaining health” as follows:

- adherence to the daily schedule – 2%;
- rational attention – 1%;
- full sleep – 5%;
- sufficient exposure to fresh air – 3%;
- healthy hygienic environment – 2%;
- favorable psychological atmosphere – 50%;
- physical education classes – 22%;
- hardening measures – 15%.

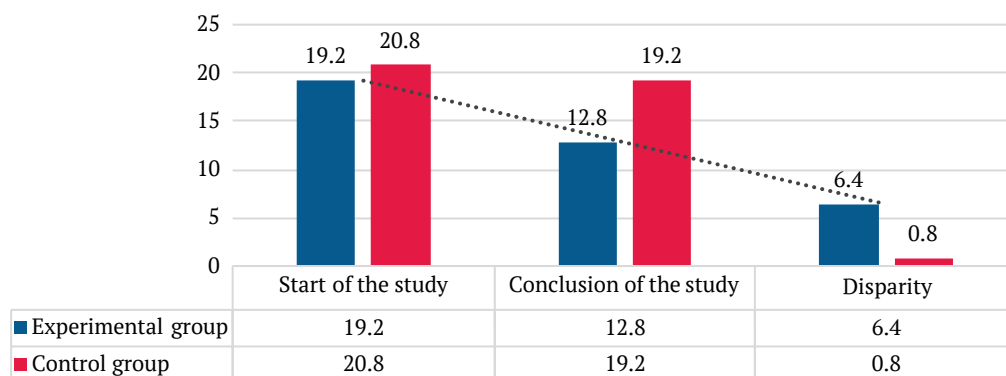
To the second question “Do you exercise in the morning?” the following answers were received: 76% of students do morning gymnastics, but irregularly; 20% answered that they do not charge at all, because they do not have time; 4% regularly exercise in the morning. To the third question “Do you agree that hardening is important for health?” all students agree that it is necessary to harden (100%). The following answers were received to the fourth question “Name the health factors of hardening on the human body”: “reduction of the risk of diseases” (35%), “strengthening of immunity” (26%), “increasing resistance to stress” (18%), “improvement of sleep” (12%), “increasing working capacity” (9%). To the fifth question, “Do you carry out hardening procedures”, the applicants answered that it is rare, because there is no time – 96% and only 4% answered that they carry out hardening procedures at home. To the sixth question “How regularly do you spend time in the fresh air?” answered: regularly – 65%, irregularly – 35%. So, based on the obtained results, we can come to a comforting conclusion that students want to engage in tempering, strive to lead a healthy lifestyle, consider tempering activities as one of the important means of a healthy lifestyle, are aware of the positive impact on health, but do not use the means sufficiently and irregularly hardening (morning gymnastics, walks in the fresh air, water treatments) due to lack of time and insufficient motivation.

So, after summarising all the data of the questionnaire, we can come to the disappointing conclusion that it is necessary to strengthen the work on some issues of physical culture and health work: popularisation of hardening among young people, mandatory conducting of morning gymnastics at home, and increasing the arsenal of hardening means. As a result of the analysis of medical data, we conducted a comparative characterisation of the experimental and control groups according to 2 criteria:

- number of cases of diseases;
- the number of absences (missed days) due to illness.

On Figure 1 histograms of the total number of disease cases in the control and experimental groups are shown. As a result of studying the incidence of control and experimental groups, authors found that:

- when comparing indicators of the level of morbidity at the initial stage of the study, the number of cases of morbidity in both groups is almost the same (CG – 20.8% of cases, EG – 19.2%);



**Figure 1.** Dynamics of the number of disease cases (blue – control group; red – experimental

**Source:** compiled by the authors (based on the experimental data obtained)

➤ at the end of the study, a decrease in the number of diseases is observed, but in the experimental group this happens much faster: CG – from 20.8 to 19.2% (-1.6%), EG – from 19.2% to 12.8% (-6.4 %).

➤ comparing the results of missed days due to illness, we also see that: at the initial stage, the percentage of missed days in both groups is almost the same (K.G. – 17.2%, E.G. – 16.5%); and at the end of the study, we again observe a decrease in the number of passes due to illness, in EG the decrease occurred by 2.7%, and in CG – by 0.8%. Also, at the end of the experiment, the morbidity of students decreased significantly and amounted to 46%. According to them and the observations of curators and teachers, students became less likely to suffer from respiratory diseases and to miss classes in the discipline “Physical Culture” less often.

Analysing the obtained results, we state that many of the students lead a sedentary lifestyle, which causes the body to increase body weight. The results obtained during the preliminary testing of functional indicators proved that in the measurements of the “Body mass index” the subjects of both groups were at approximately the same level, which is close to the increased norm for students of the 1st year. After the experiment, the result in the group of girls improved by 7.23%, and in the group of boys by 6.57%. The obtained result is statistically reliable. So, after analyzing the obtained indicators, we trace positive changes, both in the group of girls and in the group of boys.

Hardening is a prolonged process that requires consistency. Based on the results of the conducted study and considering the specifics of student life, recommendations have been substantiated to enhance the effectiveness of modern health-improving technologies within the educational process. To promote students’ well-being, regular physical education and wellness activities are recommended at least three times a week. An individualised approach is essential for implementing innovative wellness technologies, taking into account each student’s health status, physical fitness, and interests. Hardening procedures should be gradually incorporated into physical education classes, with a focus on adaptation; students should acclimate to low or high temperatures progressively, beginning

with brief exposure and gradually increasing both duration and intensity. For maximum effectiveness, a combination of various hardening methods – such as air baths, swimming, sauna use, and contrast showers – should be used, adhering to recommended procedure times. To further increase resistance to illnesses, additional preventive measures are advisable, including rinsing the mouth with cool water, wiping the body down with a cool towel, and walking barefoot indoors. Monitoring and self-monitoring of students’ well-being are crucial to determine optimal health loads and facilitate effective adaptation to hardening procedures. Moreover, informational campaigns highlighting the benefits of a healthy lifestyle and hardening practices should be organised, encouraging students to engage in wellness activities outside of class time and providing them with clear, practical guidance. To assess the effectiveness of these wellness programs, ongoing data collection and analysis of students’ physical condition are recommended. In summary, these recommendations aimed to establish a consistent and individualised approach to health promotion within the student population, integrating hardening practices that are both gradual and varied. By implementing these strategies, educational institutions can significantly contribute to enhancing students’ physical resilience, promoting long-term wellness, and instilling positive health habits.

## DISCUSSION

Thus, the obtained results testify to the tendency of elementary school students to understand the value of a healthy lifestyle, the importance of hardening procedures for maintaining and strengthening health, improving work capacity, and at the same time insufficient motivation to systematically use hardening agents in everyday life. Innovation is essential for advancing various sectors, and education is no different. As a result and a driver of progress, innovation systematically develops education as a crucial social institution centred around promoting healthy lifestyles among students. Physical education and wellness technologies are instrumental in this endeavor. The training of teachers for the new Ukrainian school involves not only acquiring professional knowledge but also developing skills to

strengthen and maintain their own health and the health of those around them. According to researchers N. Fedchyshyn *et al.* (2020) physical education plays a key role in this process. So, as future teachers, they should: understand the importance of physical activity for human health; engage in physical education and sports; know and be able to select effective means of disease prevention and improving functional capabilities; and promote an active lifestyle among students and their parents in the community.

Authors agree with the opinion of modern scientists V.V. Cheshikhina *et al.* (2022) and T.O. Loza (2022) that the use of physical culture and health technologies is one of the significant directions of innovative activity of higher education institutions in the field of physical culture and sports in accordance with the modern concept of the system of physical education. An important element of the use of innovative technologies in the work practice of higher education institutions is physical culture and health activities in the field of physical culture in general, which contributes to the effective formation of students' competent attitude to themselves and their bodies, as well as the formation of a motivational sphere, awareness of the need to strengthen health, leading a healthy lifestyle and physical improvement.

The analysis of scientific source M.P. Horobei *et al.* (2016) confirms that hardening as an innovative physical culture and health improvement technique is characterised by a set of useful results of its use, in particular: the achievement of a stable, maximally high level of health and the continuation of an active life activities; improvement of basic life support functions and systems; resistance to a number of diseases and harmful effects of the external environment; improvement of the psycho-emotional state; acquisition of applied motor skills and skills; satisfying the need for movement during active recreation and entertainment; correction of body shape and weight.

The study proved the powerful health-improving effect on the human body of hardening with the use of natural factors and motor activity. In general, modern methods of hardening are divided into two groups – traditional and non-traditional. The basis of traditional methods is a gradual decrease in the temperature of water and air, as a result of which the body gradually adapts to heat and cold. Such methods include: air hardening, solar baths, water hardening methods (general and local), non-traditional methods include methods based on temperature contrast (Vinivitin & Kovalov, 2022). Research by O.V. Lopatyuk & O.V. Zakharova (2022) has confirmed that tempering has a beneficial effect on the entire body of students, in particular, it increases the tone of the nervous system, improves blood circulation and metabolism, and contributes to resistance to diseases. The disadvantages include only non-fulfillment of the principles of tempering, as a result of which various disorders occur in the body. Therefore, during the rehabilitation of young men and women, when carrying out hardening measures, it is worth following the following rules: 1) start hardening after making sure

that the person is completely healthy; 2) procedures must be carried out regularly and systematically; 3) gradually strengthen the effect of hardening procedures; 4) individual approach; 5) contrast hardening: regular application of cold and heat stimuli of different intensity; 6) it is better to start hardening in the warm season; 7) pay attention to the child's wishes; 8) after a break, start hardening measures with initial loads.

Hardening is closely linked to the human body's ability to adapt to its environment. Scientists K.O. Karpova (2020) and S. Ketelhut & R.G. Ketelhut (2020) consider hardening as adaptation, which is achieved by repeated training exposure to this or that hardening factor, because the purpose of hardening is to train the body's protective forces, to develop the ability to quickly adapt to new conditions. All this is aimed at increasing the body's resistance, which ultimately leads to a decrease in the number of colds. The effect of tempering is not only that the body's resistance to respiratory diseases increases, but also that the internal systems of the body are improved during tempering. As a result, the general endurance and working capacity of the body increase, and body weight normalises (Denysovets & Kvak, 2023). It has been confirmed that hardening as a component of health-improving physical culture has a clear focus and specific content. Hardening is carried out in various organisational forms as special procedures or in the everyday life of a person (Shepelenko *et al.*, 2024). At the same time, differences in the organisation of various types of hardening in the educational process of the higher school were determined, which are determined by the temperature conditions and the schedule of hardening procedures, which must be coordinated with the schedule of academic classes and adapted to the conditions of self-seeding classes in health-related physical culture of the students of education. In this context, it is important to note that scientists F. Idris *et al.* (2021) and M.O. Nosko (2022) have proven that a rationally constructed system of educational activities based on health-improving technologies stimulates the biological processes of both individual organs and the organism as a whole, promotes healthy students, increasing their social and academic activity, as well as future professional activity. Confirmed that the effectiveness of hardening procedures largely depends on the correctness of their organisation and execution, when any seemingly small thing matters. It is important to note that, when conducting hardening, it is worth remembering the individual approach and state of health of each student. It is important to remember that any physical culture and health technology includes the setting of goals and tasks that contribute to health and the actual implementation of physical culture and health activities in one form or another. The technology covers not only the implementation of the health program but also certain levels of health and fitness testing, as well as management and administration issues (Hashem *et al.*, 2021).

The authors believe that institutions of higher education should consider the possibility of including tem-

pering procedures in the schedule of training classes, providing these classes with appropriate inventory and equipment. Such a well-thought-out organisation, in our opinion, will contribute to the formation in students of education of the ability to use the theoretical and practical knowledge acquired during training in everyday life, skills to use various means of health-improving activity; independently compose and conduct complexes of morning hygienic gymnastics, organise and conduct classes using health-improving technologies, determine the volume and intensity of physical exertion; use physical exercises in order to preserve and strengthen one's own health and the health of others, prevent diseases, increase mental and physical capacity; use natural and hygienic factors in the process of health training in order to restore the body and prevent premature mental and physical fatigue; to apply physical education tools in order to level the influence of harmful factors of the external environment and professional activity; apply methods of self-monitoring of the state of health, physical development and physical fitness of the body and maintenance of an optimal psychophysical state. This is fully consistent with the strategic directions of training pedagogical personnel to create a health-forming educational environment and the leading role of universities in these transformations (Strategy 2030, 2019). At the same time, at this stage, this process is complicated by insufficient funding for the work of physical culture and health clubs and sections in higher education institutions and the reduction of hours, and in some cases, the exclusion of the discipline "Physical Culture" from the curricula.

### CONCLUSIONS

So, hardening is a method of recovery that has a complex effect on the human body with the help of various natural factors, in particular: air, water, sun, low and high temperatures. Hardening procedures are one of the most important components of a healthy lifestyle. The results of the conducted comparative pedagogical experiment proved the effectiveness of the developed method of hardening students of the 1st year of different faculties. But despite this, the regulation of hardening procedures

using sauna combinations with other forms of hardening and taking into account the level of somatic health of young people needs further research. These techniques have been successfully tested in wellness groups and have proven the effectiveness of their influence on the bodies of young people. One of the effective means of introducing the hardening method is the formation of students' motivation to engage in traditional and non-traditional methods of health improvement. It is noted that the use of various hardening methods gives quite effective results. At the same time, fear of procedures and their forced performance do not contribute to a positive effect on the body. It is important to carefully plan and organise training events in such a way that they evoke positive emotions, which, in turn, increases their effectiveness. Non-traditional hardening methods also have the most effective effects. Hardening with the use of natural factors and motor activity has a powerful health-improving effect on the human body. All hardening methods include hardening activities in everyday life and special hardening procedures. However, the authors note the complexity of the organisation of the hardening process in ZVO. It is necessary to find not only effective but also, at the same time, simplified, accessible forms of organisation of hardening the body of the recruiters. There is no unity in views regarding the sequence of application, means, and their duration. This reduces the effectiveness of the introduction of the hardening method into the system of physical culture and health activities with students of various specialties. The prospects for further research in the context of the investigated issues in the development of complex and systemic approaches to the introduction of new types of motor activity into the practice of physical education, as well as in the study of ways to increase the efficiency of the system of training specialists, in particular, the use of innovative health technologies to optimise the process of professional training.

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None.

### CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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### **Тамара Денисовець**

Кандидат педагогічних наук, доцент

Полтавський національний педагогічний університет імені В.Г. Короленка

36000, вул. Остроградського, 2, м. Полтава, Україна

<https://orcid.org/0000-0002-4927-6783>

### **Ірина Денисовець**

Кандидат філологічних наук, доцент

Національний університет «Полтавська політехніка імені Юрія Кондратюка»

36011, просп. Першотравневий, 24, м. Полтава, Україна

<https://orcid.org/0000-0002-1424-1652>

### **Ольга Квак**

Кандидат біологічних наук, доцент

Полтавський національний педагогічний університет імені В.Г. Короленка

36000, вул. Остроградського, 2, м. Полтава, Україна

<https://orcid.org/0000-0002-3787-3433>

### **Оксана Даниско**

Доктор педагогічних наук, доцент

Полтавський національний педагогічний університет імені В.Г. Короленка

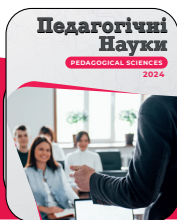
36000, вул. Остроградського, 2, м. Полтава, Україна

<https://orcid.org/0000-0003-4040-562X>

## **Оцінка ефективності застосування сучасних оздоровчих технологій в освітньому процесі ЗВО**

**Анотація.** Проблема здоров'я студентської молоді актуалізується в умовах несприятливих політичних, соціальних, економічних та екологічних факторів та зумовлена зростаючою потребою у підтримці здоров'я студентів. Шляхом вирішення означеної проблеми є ідея створення, обґрунтування та впровадження інноваційних оздоровчих технологій в освітній процес закладів вищої освіти. Метою роботи було дослідити особливості використання загартування в освітньому процесі закладу вищої освіти як інноваційної оздоровчої технології та визначити її ефективність. У дослідженні взяли участь 50 студентів першого курсу факультету історії та географії Полтавського національного педагогічного університету імені В.Г. Короленка віком від 17 до 20 років. Встановлено, що до систематичної рухової активності залучено лише 37 % студентів. Значний відсоток молоді, які не займаються фізичною культурою і спортом (74 %) страждає на незначні відхилення в стані здоров'я з боку серцево-судинної, дихальної систем, застудні захворювання, порушення функцій опорно-рухового апарату; 57 % веде малорухливий спосіб життя, що призводить до підвищення маси тіла. З'ясовано, що студенти усвідомлюють позитивний вплив загартування на здоров'я, але недостатньо та нерегулярно використовують засоби гартування. Основними причинами нерегулярного використання гартувальних заходів є брак часу та недостатня вмотивованість. Обґрунтовано та експериментально доведено ефективність технології загартування, що передбачала додатково до занять фізичною культурою в університеті, залучення студентів до занять у групах здоров'я, використання як занять у басейні, відвідування сауни з контрастним душем, тривалість яких поступово збільшувалася, а також самостійних занять вдома (прийом повітряних ванн, полоскань порожнини рота прохолодною водою, обтирання горла прохолодним рушником, ходіння босоніж). Практичне значення результатів полягає в можливості їх використання в закладах вищої освіти для підвищення фізичного та психічного здоров'я студентської молоді, покращення функціонального стану та адаптаційних можливостей організму, опірності до захворювань, нормалізації маси тіла, що сприятиме їхньому успіху в навчанні та загальній якості життя

**Ключові слова:** здоров'я; загартування організму; фізкультурно-оздоровчі технології; гартувальні заходи; здобувачі ЗВО



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### Nataliia Snizhko\*

PhD in Physics and Mathematics, Associate Professor  
Zaporizhzhia Polytechnic National University  
69063, 64 Zhukovskiy Str., Zaporizhzhia, Ukraine  
<https://orcid.org/0000-0003-4547-5934>

### Volodymyr Kozlov

PhD in Engineering, Associate Professor  
Zaporizhzhia Polytechnic National University  
69063, 64 Zhukovskiy Str., Zaporizhzhia, Ukraine  
<https://orcid.org/0000-0002-0048-2535>

## Possibilities for integrating the flipped classroom into a bilingual course in higher mathematics at a technical university

**Abstract.** Changes in higher education paradigms and the challenges of globalisation necessitate revising methods and approaches to teaching disciplines in Ukrainian universities. This article aimed to summarise and analyse the practical application of flipped classroom technology in teaching higher mathematics to students specialising in engineering and technical disciplines on a bilingual basis. The study utilised general scientific research methods: theoretical methods (system analysis, comparison, generalisation, synthesis) and empirical methods (pedagogical observation, interviews, professional experience exchange, and analysis of pedagogical activity outcomes). The study examined the stages of flipped classroom technology from a historical perspective and identifies the rationale for employing this methodology under conditions of limited social contact. The advantages of this teaching model for mathematical disciplines taught bilingually were analysed. The essential role of information and communication technologies in implementing the flipped classroom model was elucidated. The authors' experience teaching English-language mathematics courses to prospective engineers using flipped classroom methods in a distance learning context was discussed and thoroughly evaluated. Potential disadvantages of this teaching model were also highlighted. It has been determined that the flipped classroom represents a learning model in which a student-centred approach predominates, significantly enhancing interaction between students and lecturers. This approach fosters greater student engagement and facilitates the acquisition of subject matter in a foreign language. The findings of this study can be applied to the teaching of professional disciplines at technical universities, both in the native language and bilingually.

**Keywords:** bilingual education; bilingual teaching/learning; subject-oriented didactic models; mathematical courses; flipped learning; information and communication technologies

### INTRODUCTION

The current stage of development in the Ukrainian education system is characterised by the rapid implementation of innovative processes aimed at its integration into the global educational landscape. Significant changes in pedagogical theory and educational practice focus on

harmonising Ukrainian and international educational programmes, enhancing the academic mobility of Ukrainian university students, and ensuring the international recognition of domestic higher education qualifications. In this context, it is crucial to prepare specialists who not only

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\*Corresponding author



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possess modern knowledge but can also apply it effectively in practical work within a globalised environment, including proficiency in documentation and communication in foreign languages. Consequently, the adoption of bilingual education has become increasingly relevant. Bilingual education enables a foreign language, alongside the native language, to function as a tool for learning, self-education, intercultural communication, and fostering multicultural awareness. One significant aspect of modernising higher education involves the integration of bilingual teaching and learning into professional university training. Bilingual education entails delivering professional disciplines in a foreign language, which serves as a medium for exploring various subject areas. This study focuses on disciplines within the mathematical cycle, which are foundational for students specialising in engineering and technical fields.

The education sector, like all areas of public life, has faced significant changes and challenges. The WHO declared the spread of coronavirus infection a pandemic, leading to recommendations to limit social contact and shift learning from physical classrooms to virtual ones. This relocation of learning environments has accelerated the adoption of information and communication technologies in higher education, providing an alternative means of acquiring and disseminating knowledge during a critical period of human development. The latest generation of state educational standards optimises the learning process by incorporating distance learning, which aims to enhance educational quality, promote students' information mobility, and foster their capacity for self-directed learning. This shift in educational paradigms is reflected in Ukrainian legislation (Resolution of the Cabinet of Ministers of Ukraine No. 896, 1993; Decree of the President of Ukraine No. 347/2002, 2002).

New educational standards can be implemented within the framework of the so-called flipped classroom (FC). This teaching model was introduced in the United States in the early 2000s, with chemistry teachers Jonathan Bergmann and Aaron Sams recognised as its founders (Bergmann & Sams, 2012; Siegle, 2014). These educators provided their students, who frequently missed classes, with recorded lectures to help them address gaps in their knowledge. Their initiatives formed the foundation for the development of a new educational programme. In the spring of 2007, Bergmann and Sams used PowerPoint to create several slide-shows with voiceovers and text notes. They converted these into video files that were distributed online, allowing students to access the materials at their convenience. This methodological innovation attracted the interest of colleagues from other disciplines and was subsequently adapted for foreign language classes and other courses. The practices developed by Bergmann and Sams extended beyond the United States and were tested by educators in other countries. The flipped classroom is a hybrid strategy that divides learning into two distinct phases, in contrast to traditional teaching approaches. During the first phase, conducted remotely, students independently study

learning materials and resources. The second phase occurs in either an online or physical classroom, where teachers and students engage in discussions and collaborate on group projects. Additionally, FC is typically supported by an educational platform that integrates various digital learning and assessment tools. This platform serves as a centralised hub for teachers to provide assignments, interactive content, and learning resources. It also enables them to monitor students' progress and facilitate communication. Overall, FC leverages digital tools and platforms to combine in-person and virtual instruction, thereby enhancing learning quality and fostering student engagement.

This technique has become widespread globally. It is regarded as an evolution of pedagogical approaches that enable lecturers and professors to align their teaching practices with the demands of the digital age. Today's students have grown up surrounded by a multitude of online resources and technological devices, and FC aims to utilise these resources effectively. Among the numerous studies on FC technology, several notable research studies stand out. Research indicates that the advantages of FC technology outweigh those of traditional teaching methods (Beatty *et al.*, 2019). Some studies describe how traditional, passive classes have been transformed into active and individualised learning environments (Goedhart *et al.*, 2019). FC is viewed as a methodology that allows students to learn at their own pace before attending classes and facilitates collaborative interactions and dynamic classroom engagement (Chen *et al.*, 2019; Lo & Hew, 2020). Research by M.Y. Doo & C.J. Bonk (2020) demonstrates that FC is associated with higher levels of student engagement and interest in the subject, as well as increased opportunities for student-centred learning. The integration of FC with problem-based learning has also been explored (Oliván-Blázquez *et al.*, 2022). However, these studies primarily focus on the application of FC technology in settings where students study in their native language rather than a foreign language.

Few studies investigate the use of FC technology in bilingual education at universities. For instance, a modified bilingual flipped learning approach was developed for training international nurses in Finland. This method, which emphasised independence and teamwork, involved dynamic in-class activities and pre-class content, enhancing communication, decision-making, and language proficiency (Cubelo, 2023). Another study examined the usefulness of FC compared to traditional methodologies in training primary school teachers in bilingual classrooms. It analysed students' perceptions of teaching approaches employed in their classrooms and studied during their teacher preparation (Torres, 2022). It is essential to transition students' learning styles from passive acceptance to active engagement through flipped classroom teaching, thereby improving learning outcomes. For example, recommendations for implementing the FC teaching model in bilingual courses on international business negotiation were provided (Zhang *et al.*, 2022). Similarly,

FC teaching modes have been applied in teaching reforms for training applied talents (Jianghong *et al.*, 2021). Traditional bilingual teaching methods in International Business Management were found to require improvement, and FC was used as an alternative (Bian, 2021). There is a lack of research on the implementation of FC in bilingual engineering and technical courses, particularly in bilingual mathematics courses.

The purpose of this research was to summarise and analyse the practical application of flipped classroom technology in teaching higher mathematics to students specialising in engineering and technical disciplines in a bilingual context.

## MATERIALS AND METHODS

The research was conducted at Zaporizhzhia Polytechnic National University (Electrical Engineering Faculty). The concepts of Flipped Learning and Bilingual Teaching were adopted as the theoretical foundation of the study. In the first stage, a review of scientific publications and methodological literature on the topic was conducted. Works from the scientometric databases Scopus and WoS were considered. The search was conducted using the keywords: “blended learning”, “inverted class”, “flipped learning”, “flipped classroom”, “bilingual teaching”, “subject-oriented didactic models”, “higher mathematics”, “engineering education”, and “information and communication technologies”, among others. Additionally, methodological materials relevant to the topic were analysed, including the passport and educational programme of the relevant speciality, as well as curricula for mathematical, general technical, and professional disciplines. Methods of analysis and synthesis were applied in the review of the literature. Special attention was given to the application of FC methodology in bilingual classes. The methods of comparison and classification were used to study the peculiarities of FC for students of various specialities and its application to different disciplines. The second stage of the research involved practical implementation. This consisted of conducting mathematics classes using FC methodology. The research methodology necessitated the implementation of the following elements:

The essence of the *FC methodology*. The FC model is a form of blended learning aimed at integrating new information and communication technologies into the educational process to optimise it and enhance students’ motivation. This approach is particularly relevant in distance education, where audio and video materials play a significant role. In this model, the teacher provides students with materials to listen to or watch for preliminary self-study at home. During class sessions (whether online or offline), students discuss the material and tackle more complex practical problems. This constitutes the core principle of the FC concept: new topics are studied independently at home, while activities typically assigned as homework – such as reinforcing and consolidating the topics covered – are completed under the teacher’s guidance during class.

*Materials used at the individual stage of FC.* FC is comprehensive and includes presentations, vodcasts, podcasts, and pre-vodcasting. A vodcast is an audio lecture accompanied by video content. It involves engaging with video material and includes various activities such as working with authentic resources, completing tests, and undertaking creative tasks. A podcast is an audio file sent to participants in the educational process, which can be accessed either online or offline. Prevodcasting refers to a teacher’s methodological practice that provides an overview of the topic at the start of its study through a vodcast. Of the FC components, vodcasts and presentations are the most convenient to use, as they serve as the primary sources of learning material for students. The video content should not exceed 15 minutes in duration to maintain engagement and focus.

*Auditory stage of FC.* After utilising FC resources, the learning process transitions from the online environment to the classroom for solving practical and theoretical problems, conducting empirical tasks, and consolidating learned material. This stage can be conducted either in person or remotely in a synchronous mode. To assess comprehension of the material, the teacher prepares questionnaires, tests, and written exercises. If a student does not fully understand the material, they have the opportunity to review or listen to it multiple times as needed. Face-to-face (or synchronous distance) classes focus on solving more complex tasks, with the teacher acting as a tutor, guiding students through the learning process.

In the second stage of the research, the primary method was a natural pedagogical experiment, involving the educational process conducted under predetermined parameters. As part of this framework, purposeful pedagogical observation of students’ academic performance was carried out, and any challenges encountered were documented. In the third stage of the research, the outcomes of FC implementation within the bilingual mathematics course were evaluated. The exchange of experiences, along with the study and discussion of the results, took place during methodical seminars and meetings of scientific and methodological councils. Methods of systematisation and generalisation were employed to formulate the conclusions of the study.

## RESULTS

Since 2019, the Faculty of Electrical Engineering has formed groups of students for bilingual education, where mathematical, general technical, and professional disciplines are taught in English. The university utilises the Moodle distance learning system as its educational platform. Before the transition to the distance learning format, FC methods were used to introduce and consolidate new subject and grammatical material, provide students with supplementary resources, and conduct tests. With the implementation of online learning, the FC method became a central approach to student engagement. Prior to lessons (typically one week in advance), students receive pre-vodcasting materials prepared by their lecturers. These include lecture presentations with theoretical content, vodcasts,



and video examples of solving standard problems on the topic. As the mathematical material is presented in English, it is deemed essential to provide students with a thesaurus for the topic. This includes a file containing English terminology and speech expressions relevant to the subject matter. Lecturers also provide a brief test to evaluate students' comprehension.

After completing the test, students can assess whether they have adequately mastered the preliminary material. Feedback from lecturers is facilitated through the Moodle electronic learning system. If students encounter difficulties or have questions about the material, these are addressed directly during practical sessions, conducted either face-to-face or online. For instance, in the linear algebra course, the topic "Determinants of Matrices" is introduced. Students are granted access to videos such as "Calculation of Second-Order Determinant" and "Calculation of Third-Order Determinant". A file containing key terminology is also distributed. After reviewing the material, students complete a test comprising theoretical multiple-choice questions on definitions and terminology, a calculation of a second-order determinant with a definitive answer, and an open-ended task requiring the calculation of a third-order determinant. During the practical session, lecturers and students address any queries on the topic, solve more complex problems involving higher-order determinants, and explore applications of determinants in practical scenarios. The content of the podcasts and vodcasts is tailored to the topic and students' specialisations. Videos are a cornerstone of the FC learning experience. For example, in the analytical geometry course, during the study of the topic "Second-Order Surfaces", students receive a link to a video featuring a 3D animation of a surface derived from a second-order equation. Following this, students are tasked with completing a test that matches each surface with its corresponding equation.

When studying the topic "Derivative" in the mathematical analysis course, students are provided with a corresponding podcast. Having mastered the prior topic, students are introduced to new vocabulary, enabling them to answer the questions following the podcast and complete a basic test. For the topic "Calculation of Volumes Using Multiple Integrals", students receive a podcast and a video featuring visualisations of specific three-dimensional shapes. The students are tasked with proposing a method for calculating the volumes of these shapes and presenting their approach orally during class discussions with the lecturer. The class then analyses and evaluates the proposed solutions collectively. In addition to podcasts, authentic English-language video and audio materials on mathematics, such as those available on YouTube channels, are utilised. The goal is not only to help students engage in mathematical dialogue but also to enhance their listening skills in authentic English. Listening skills are developed by initially listening to English in the background to become accustomed to its intonation, followed by adjusting the playback speed using YouTube's speech slowdown

feature to suit the listener's level. Subtitles can also be activated in the desired language for better comprehension. For example, in the field theory course, during the study of the topic "Vector Field", students are provided with an authentic English-language video where the lecturer demonstrates and comments on the Oersted experiment, which determines the direction of the magnetic field of a steady current. Similarly, in the probability theory course, when exploring the topic "Conditional Probability", students are shown an authentic English-language video demonstrating the Monty Hall Dilemma.

By employing FC technology, students are required to study new material as homework before the next class session. They watch and listen to the materials at their convenience, revisiting them as often as necessary to comprehend the sections under study. Students are encouraged to take notes, answer questions, prepare topics for in-class discussion, complete tests, or undertake written assignments. Through this process, students not only grasp the subject material but also enhance their English-speaking, listening, and reading abilities, practise using relevant lexical and grammatical structures, and refine their writing skills. It should be noted that teaching mathematics in English presents specific challenges. Typically, the student's English proficiency within a group is uneven. Some students, despite possessing adequate mathematical knowledge, feel insecure in class due to their weaker English skills. These students may refrain from participating in discussions and, as a result, disengage from classroom activities. The FC approach allows such students to prepare for lessons at their own pace, learn vocabulary and speech patterns pertinent to the topic, and prepare their contributions in advance. This preparation helps them gain confidence, perform on par with their peers, and actively participate in class activities.

The positive aspect of the FC approach lies not only in its capacity to combine e-learning with in-person classes but also in the accessibility of educational resources. Students can engage with the material using various mobile devices. These methods are applicable to students across diverse fields, specialisations, and age groups, underscoring the universality of this approach. Another advantage is the integration of additional authentic materials in bilingual learning. The quality of students' independent work is easily assessed, as lecturers can evaluate their grasp of topics during practical lessons based on their preparation through pre-podcasting and podcasting. This methodology is particularly relevant during periods of distance learning, where maintaining students' motivation to study independently becomes crucial, especially in the absence of direct pedagogical guidance. The implementation of FC technology during a pandemic or under martial law addresses several objectives of distance learning:

1. Creating a "virtual" educational environment enriched with presentations, audio and video materials, and interactive tasks, accessible regardless of time and location;



2. Facilitating continuous and summative assessments of students' competencies by offering various forms of final evaluations;

3. Enhancing English language proficiency alongside mathematical skills, thereby promoting spontaneous communication and enabling access to authentic sources of information.

According to state standards, future graduates of higher education institutions are expected to solve professional problems involving modern hardware and software, organise and conduct experimental research, and apply computer modelling using advanced tools and methods. These requirements align well with the FC framework. While it is impractical to entirely replace traditional teaching methods, combining conventional approaches with FC technology proves to be a productive strategy for teaching students.

## DISCUSSION

The standards of the International Society for Technology in Education establish specific requirements for the learning process. For instance, the standards issued in 2016 specify that:

1. Students should have access to technical tools and the ability to adapt learning spaces, irrespective of the location of the educational institution or the students themselves;

2. Understanding the dynamics of learning in diverse settings should align with the use of safe and legal teaching methods and techniques;

3. Critical thinking should serve as a cornerstone for acquiring new knowledge;

4. Theoretical knowledge should connect to practical applications to develop innovative solutions in various scenarios (ISTE, 2016).

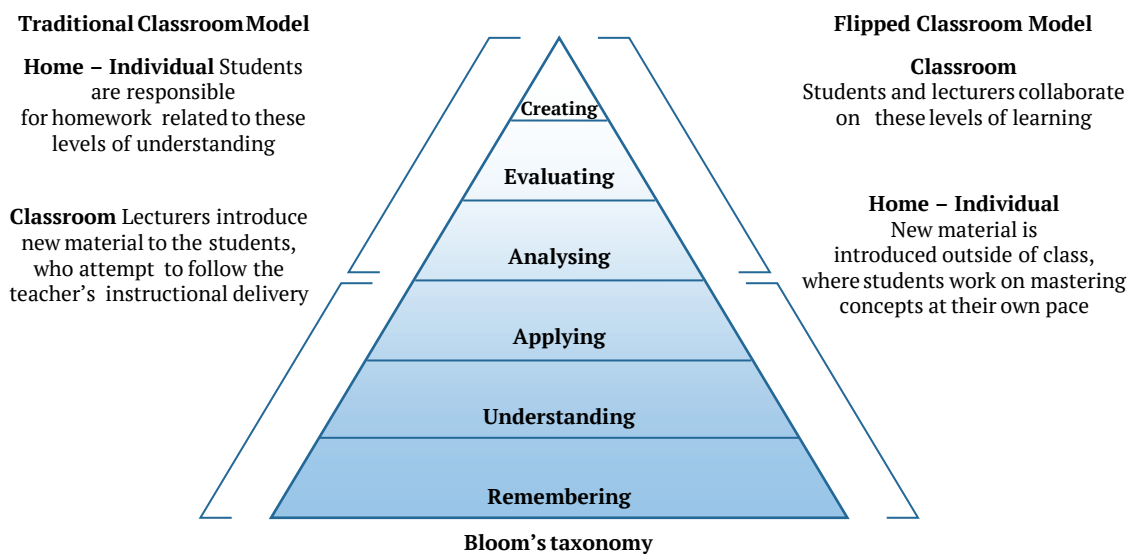
These requirements can be effectively implemented through the FC framework. The FC model redefines the traditional learning process: conventional approaches are linear and time-bound, making it difficult to revisit previously covered material. By contrast, FC technology allows students to set their own learning pace. They can review educational videos independently, regardless of external circumstances. Additionally, students can organise video conferences without an lecturer to collaborate and complete tasks collectively. FC also transforms students' roles from passive recipients of knowledge to active participants in its acquisition.

The guiding principle of FC, a hybrid approach, is "homework in class and reading at home". This strategy offers flexibility depending on factors such as activity duration, available resources, students' abilities, and the lecturer's creativity. According to J. Lecocq & M. Lebrun (2016), "any teacher can experiment with it, on a small or large scale". The integration of innovative ICT-based practices has significantly influenced education. In this context, the evolution of the FC methodology in research warrants attention. J. Bergmann & A. Sams (2012), two of the approach's creators, introduced "flipped learning", a more advanced FC model. They observed that, in the tradition-

al FC model, "all students watch the same video on the same night" before completing identical tasks in class. It is crucial to acknowledge that pupils in a group frequently have varying skill levels and aptitudes. This indicates that while some students are on track, others might have trouble understanding ideas or require further time. Students can study "the material at their own pace" using the FC approach. Not every student watches the same film on the same night as a result. Students watch and learn in an asynchronous and differentiated system that aims to have them assimilate and master the material at their own pace".

In their research, Marcel Lebrun and Julie Lecocq propose a three-level classification for FC. The first level represents the foundational stage, where lecturers upload course materials online for students to access outside of class. Classroom activities focus on discussions and exercises, providing more time for collaborative and interactive learning. The second level introduces greater complexity: students are encouraged to conduct preliminary research and readings that form part of the course. In addition to structured discussions and activities, students co-create the course by utilising IT tools or delivering oral presentations. "In the form of a cycle, it would go beyond the deterministic linearity of "before class/during class" to become a spiral made of successive contextualisation (the meaning of knowledge, practices, contexts), decontextualisation (invariants, principles, models, theories), and recontextualisation (applications, situations, transfer)", according to J. Lecocq & M. Lebrun (2016), who describe the third level as a combination of the first two. The hybrid nature of FC – balancing theory and practice, in-person and remote learning, knowledge acquisition and skill development – enables the integration of diverse pedagogical techniques from constructivism, behaviourism, cognitivism, socio-constructivism, and connectivism. As J. Lecocq & M. Lebrun (2016) observe, FC is "a fertile mix of direct transmission (I teach) with a constructivist or socio-constructivist approach to learning (it is up to the learners to learn)", aimed at enhancing students' capacity for autonomous learning, including the knowledge, skills, and interpersonal abilities required to decide what, when, and how to learn.

Therefore, all theoretical information is remotely transferred through a digital platform due to the relationship between presence and distance. This content is provided through an educational platform or institution chosen by the lecturer before class, typically in the form of text files, study materials, or lectures with commentary or videos. The classroom is reserved for assignments that require student engagement and teacher supervision. From the perspective of B.S. Bloom's (1956) taxonomy, the hybrid nature of FC enables the exploration of different levels within the cognitive domain. As shown in Figure 1, the pre-class time is dedicated to lower-level skills, such as "recognising and understanding", which represent the first two levels of the pyramid. Conversely, the four higher levels of the pyramid – "applying, analysing, evaluating, and creating" – can be addressed in the classroom.



**Figure 1.** Bloom's taxonomy adapted to the flipped classroom by B. Williams

**Source:** developed by the authors based on H. Dufour (2014)

This study supports the conclusions of other researchers regarding the advantages of FC technology over traditional methods (Kuzu, 2007; Danker, 2015). Authors agree that FC promotes student engagement (Kazu *et al.*, 2014; Sohrabi & Iraj, 2016). The relevance of FC technology in the digitalisation era is confirmed by other studies (Kim *et al.*, 2014). Despite the many benefits of FC, its disadvantages must also be considered. First and foremost, such training can only be efficiently organised if students are highly motivated and eager to acquire new knowledge, rather than simply searching for answers to test questions in videos or presentations. It is worth noting that some topics (for example, methods of calculating indefinite integrals of trigonometric or rational functions) do not generate much enthusiasm among students and tend to stagnate at this stage. Students who have not thoroughly engaged with the preliminary material provided will be unable to fully participate in class discussions with the lecturer. The challenge of providing proper technical and methodological training for university lecturers remains significant, as the existing material and technical infrastructure pose difficulties in preparing audio and video lectures. This leads to an increased time commitment for lecturers in preparing lessons, adding to their overall workload. The authors' experience also indicates that this methodology requires well-organised feedback that accounts for the nuances and specificities of the material being taught.

### CONCLUSIONS

It was found that FC is a learning model in which a student-centred approach prevails, and the interaction between the student and lecturer is significantly increased.

In this case, the lecturer acts as a mediator of the learning process, rather than an omnipotent guru, and the student is responsible for the learning outcomes achieved through an activity-based constructivist approach. FC technology can be used for both lectures and practical classes on mathematical subjects taught in a foreign language. Modern technologies enable the selection of relevant material and the creation of effective and engaging tasks. Since FC serves as a compromise between traditional and distance learning, students enhance their autonomous learning skills and strengthen their motivation. Despite some drawbacks, this model of teaching promotes student engagement and greatly facilitates learning a foreign language.

The strengths of FC can serve as a motivating factor for many lecturers to adopt FC technology for teaching any subject at the university level, including bilingual education. Innovations in teaching and learning are undoubtedly one of the most important factors determining the success of higher education. The ability of FC to combine several pedagogical approaches and utilise ICT provides a significant advantage when developing innovative teaching methods.

It is recommended to conduct a statistical experiment to determine the impact of FC technology on the delivery of subject content and the development of students' bilingual professional communicative competence. This will further deepen the understanding of FC and its potential benefits in bilingual education at technical universities.

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None.

### CONFLICT OF INTEREST

None.

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### **Наталія Сніжко**

Кандидат фізико-математичних наук, доцент  
Національний університет «Запорізька політехніка»  
69063, вул. Жуковського, 64, м. Запоріжжя, Україна  
<https://orcid.org/0000-0003-4547-5934>

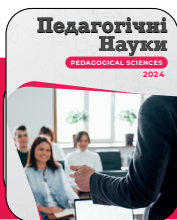
### **Володимир Козлов**

Кандидат технічних наук, доцент  
Національний університет «Запорізька політехніка»  
69063, вул. Жуковського, 64, м. Запоріжжя, Україна  
<https://orcid.org/0000-0002-0048-2535>

## **Можливості інтегрування технології «flipped classroom» у білінгвальний курс вищої математики в технічному університеті**

**Анотація.** Зміна парадигм вищої освіти, виклики глобалізації зумовлюють необхідність перегляду методів і підходів до викладання дисциплін в українських університетах. Метою даної роботи було узагальнення та аналіз практичного застосування технології перевернутого класу при викладанні курсу вищої математики студентам інженерно-технічних спеціальностей на білінгвальній основі. У роботі використовувались загальні методи наукового дослідження: теоретичні (системний аналіз, порівняння, узагальнення, синтез) та емпіричні (педагогічне спостереження, бесіда, обмін досвідом роботи, вивчення результатів педагогічної діяльності). Описані ступені становлення технології перевернутого класу в історичному ракурсі. Встановлені причини, які зумовлюють застосування даної методики в умовах обмеження соціальних контактів. Проаналізовано переваги даної моделі навчання при вивченні математичних дисциплін на білінгвальній основі. З'ясована істотна роль інформаційно-комунікаційних технологій при використанні моделі перевернутого класу. Детально описано та проаналізовано досвід авторів викладання англійських математичних курсів майбутнім інженерам із застосуванням технології перевернутого класу в умовах дистанційного навчання. Зазначені можливі недоліки даної моделі навчання. Встановлено, що перевернутий клас – це модель навчання, в якій переважає особистісно-орієнтований підхід, значно збільшується взаємодія між студентом та викладачем, зростає залученість студентів, для них полегшується вивчення предмету іноземною мовою. Результати роботи можуть бути застосовані в процесі викладання фахових дисциплін в технічному університеті, як рідною мовою, так і на білінгвальній основі.

**Ключові слова:** білінгвальна освіта; модель білінгвального навчання; предметно-орієнтовані дидактичні моделі; математичні дисципліни; технологія «перевернуте навчання»; інформаційно-комунікаційні технології



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**Valeriia Mykhailenko\***

Graduate Student, Senior Lecturer  
Dragomanov Ukrainian State University  
01601, 9 Pyrogov Str., Kyiv, Ukraine  
<https://orcid.org/0000-0002-8318-2457>

## Syllabic structure of the word: Examination and formation of knowledge in students with intellectual disabilities in primary schools

**Abstract.** The purpose of the study was to examine the formation of the sound-component structure of speech of students with intellectual disabilities in Ukrainian language lessons. The methodology of observation, testing, and questionnaires were used to achieve this goal. The object of the study was the students with minor learning disability. The main focus of the study was on the development of individual approaches that consider the special needs of students, and interactive teaching methods aimed at stimulating speech activity, didactic games, and exercises were used to stimulate speech activity. The role of didactic games, visual aids, and exercises in the development of speech and grammar skills in children with intellectual disabilities is also examined. The results showed that systematic familiarisation with the sound structure of words and the development of phonemic perception positively affect the speech development of mentally disabled children. Students find substantial difficulties in developing speech skills, especially in using the component composition of words, based on the results. When working with complex words, the number of syllables and grades are often confused. Slowly but surely, due to the systematic use of didactic techniques, progress was made in the development of phonetic hearing and the analysis of speech structure. Students who have completed specially designed exercises should substantially improve their language skills. 75% of students participating in the study showed an improvement in their understanding of the sound-syllabic structure of words, which was confirmed by statistical data. There are certain factors that hinder the educational process, in particular, insufficient attention to the development of communication skills in the educational process. It is necessary to ensure the individual characteristics of each child to improve the speech development of children with intellectual disabilities. In the results obtained, the basis for further correctional programmes in the field of special education can be identified.

**Keywords:** language evolution; inclusive education; correctional pedagogy; game methods; social integration

### INTRODUCTION

Speech development is one of the key components of a child's overall development because speech is not only a means of communication but also an important tool for learning about the world around them. For children with intellectual disabilities, speech development is a particularly complex process that requires comprehensive attention and a special approach. These difficulties are particularly noticeable in elementary school classes, where attention is focused on basic language skills such as word sounds and syllable structure. Speech disorders in children with intellectual disabilities substantially complicate their ability to

master a complex language system, including correct articulation, perception, and production of language units. This affects their social adaptation, learning, and perception of the world. An important aspect that deserves detailed examination in this context is the formation of the syllabic structure of words. This is because it is the basis for proper assimilation of grammatical and lexical norms of the language.

The problem of impaired self-regulation and organisation of mental actions in unfamiliar situations was investigated by L. Prokhorenko *et al.* (2021). After conducting an empirical review through testing, the authors determined

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\*Corresponding author



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that students often refuse to solve problems or simplify tasks, indicating weak abilities for self-regulation and an inability to purposefully organise their mental actions. The study analysed how different learning styles, students' level of emotional stability, or socioeconomic status can affect students' learning behaviour. This combines an understanding of the complexity of the problem and the possibility of a personalised approach to learning to help students better adapt. A study conducted by E. Kikas *et al.* (2008) highlighted the relationship between language skills in primary school students with learning problems and children who are developing normally. The problem is a lack of understanding of how specific learning disabilities affect language development. S. Malki & T. Einat (2019) examine the inclusion of students with intellectual disabilities in Israeli primary schools and the attitude of inclusive teachers to this process. It is proved that teachers with a positive attitude to the inclusion process are more effective in helping students with intellectual disabilities adapt to the general educational environment. However, negative attitudes and poor teacher training can substantially complicate this process, highlighting the importance of appropriate training and support to ensure inclusion. These authors did not consider aspects of the influence of the home environment on teachers' attitudes to receiving students with intellectual disabilities. For example, it did not analyse how the support or resistance of students' parents affects teachers' motivation to introduce inclusive practices in their classrooms.

S. Stebljuk *et al.* (2021) investigated the process of formation of communication skills in younger schoolchildren with intellectual disabilities in the context of inclusive education. The main challenge is to be able to effectively integrate these students into the educational environment. The main results of the study showed that effective communication of students with intellectual disabilities in the educational environment can be fully ensured, provided that their special educational needs are considered. This highlights the importance of creating appropriate conditions and support for the integration of these students. J.A. McKenzie & C.I. Macleod (2012) applied the concept of Michel Foucault's medical perspective and the psychological experience of Nicola Rose to develop important ideas in the education of children with intellectual disabilities. Two forms of expert knowledge that play a key role were analysed. The analysis showed that medical and psychological approaches often lead to the classification and normalisation of these students, which may limit their opportunities in the learning process. The authors emphasise the importance of critically reviewing these approaches to develop more comprehensive educational policies that meet the needs of South African children. The authors do not analyse how different cultural values affect attitudes towards inclusion and learning about inclusion, or even the learning outcomes expected of students. This limits understanding of how different cultural environments affect the success of inclusive education and the integration of students with

intellectual disabilities into the regular education system. Considering these aspects will help to develop more individual and effective educational programmes that meet the needs and characteristics of different groups of students.

A paper of A. Hanreddy & D. Östlund (2020) examines alternative curricula for students with intellectual disabilities and their impact on inclusive education. The authors emphasise that intellectual disability is a socially deterministic category and can vary from culture to culture. However, despite these changes, students with intellectual disabilities often face isolation and low expectations in the school environment. J. Pownall *et al.* (2020) examined the relationship between social isolation and health literacy among young people with intellectual and physical disabilities, especially in terms of sex education. A study by D. Ioanna (2020) presents the concept of an independent life for people with intellectual disabilities in Greece to parents, teachers, and people with intellectual disabilities. The paper examined how school psychologists interpret intelligence tests to identify specific learning difficulties. The problem is that parents and teachers do not understand how important independent life is for people with intellectual disabilities. The author noted that intelligence tests are used to detect learning difficulties, but their use can be ambiguous. Researchers J.N. Kranzler *et al.* (2020) focus on the various approaches used by practical psychologists and the impact of these approaches on school practice. The authors noted that the lack of agreed assessment criteria may lead to inconsistencies in practice and aspects of the impact of practical recommendations for teachers and parents on accompanying students with intellectual disabilities in the learning and socialisation process were not considered.

The purpose of this study was to analyse the specific features of the formation of syllabic word structures in mentally disabled children of primary school age and develop effective methods for improving these abilities. Based on the set goal of the study, the following subjects were identified, such as: research of scientific approaches to the formation of word components in mentally disabled children, analysis of typical mistakes made by primary school students when reproducing syllabic structures of words, development of a series of iterative exercises aimed at improving formations.

## LITERATURE REVIEW

Special education programmes were reviewed by G.H. Al-nahdi *et al.* (2024) for students with intellectual disabilities, emphasising the need for individual approaches and inclusive practices. The authors established that families and teachers were dissatisfied with the current curriculum. This study highlighted the need to improve the curriculum to better meet the individual needs of these students. W. Xin *et al.* (2024) analysed the views of Chinese primary school teachers on teaching students with intellectual disabilities. Researchers have identified three categories of beliefs, which allow for a better understanding of the professional perspective of teachers. N. Panopoulos &

M. Drossinou-Korea (2020) used Bronfenbrenner's theory to analyse the improvement of reading comprehension in students with intellectual disabilities through individual programmes. N. Schoop-Kasteler & C.M. Muller (2020) focused on assessing student relationships in special classes and analysing social interactions and friendships. The study offered new directions for further scientific research. H.I. Cannella-Malone *et al.* (2021) conducted a systematic review of the literature on the development of learning skills in students with serious intellectual disabilities. This study determined that most interventions were effective, especially those that combined modelling, cues, and visual support. A study by O. Aktan (2020) was dedicated to examining the educational needs of teachers in the context of inclusive learning. The author identified a substantial gap in the professional training of teachers – a lack of knowledge to develop individual plans and provide effective support to students and their families.

A. Kart & M. Kart (2021) conducted a comprehensive literature review on the implications of inclusion for students without disabilities. The study showed the positive impact of an inclusive environment on social adaptation, promoting tolerance, and reducing prejudice. L. Tometten *et al.* (2021) focused on the relationship between teachers' awareness of special educational needs and students' social participation. The researchers established that students with emotional and behavioural disorders have lower levels of social integration and academic performance compared to other students. J.R. Root *et al.* (2022) investigated the effectiveness of modified schematic instructions for students with autism and intellectual disabilities. Researcher I.A. Pramantik (2021) has optimised traditional games such as Gobak Sodor games to develop the character of children with mild intellectual disabilities. The study has shown that combining adaptive physical education techniques with traditional games can substantially improve children's cognitive, social, and practical skills. Instead, researchers like Y. Bystrova *et al.* (2021), focused on social and pedagogical support for children with visual impairments in general education institutions. M.M. Kim & E.L. Kutscher (2021) used longitudinal data to investigate factors that influence the development of academic achievement and confidence in students with disabilities. In turn, J.A. Kurth *et al.* (2021) examined teacher training for inclusive education for students with serious disabilities. They used the Delphi examination to identify key skills and techniques that teachers need to master to effectively support such students. S. Krämer *et al.* (2021) conducted a meta-analysis of cognitive and psychosocial outcomes in students with learning difficulties. The study showed that inclusion has a noticeable effect on cognitive outcomes, but has almost no effect on psychosocial performance.

Authors C.C. Klimaitis & C.A. Mullen (2021) focused on investigating the involvement of students with disabilities in STEM education. The researchers analysed teachers' plans for inclusion in primary, middle, and high schools, examined teaching methods in Virginia, and identified

seven key approaches to effective integration. D. Domin *et al.* (2020) devoted a study to the prospects of readiness of students with intellectual disabilities for federally funded higher education programmes in the United States. They identified a relationship between successful employment and three key strategies: engagement, improving access to career services, and building partnerships. M. Medina-García *et al.* (2021) also considered the important role of inclusion. Their study showed that information and communication technology skills affect teacher motivation, although the level of use of these technologies in primary schools was low. Other researchers, including R.R. Schallack & R. Luckasson (2021) concentrated on terminology and classification aspects. They reviewed in detail the differences between intellectual disability and developmental disorders and proposed refined terminology – intellectual disability and developmental disability. B. Akdemir (2024) examined the opinion of special education teachers on inappropriate sexual behaviour among young people with intellectual disabilities. The findings show that the most common behaviours of this kind are masturbation and undressing and that teachers are poorly prepared to intervene in such situations due to a lack of appropriate training.

The attitudes of primary school teachers towards inclusive education were examined by K.T. Lindner *et al.* (2023), they determined that teachers preferentially focus on students with complex disabilities and demonstrate a neutral or ambivalent attitude towards inclusion. This indicates that there are certain psychological barriers to the perception of inclusive learning. Another study conducted by S. Schwab *et al.* (2022) concluded that children often do not have friends in class. Particularly interesting was the fact of a substantial discrepancy in the assessments of friendship between students and teachers, which indicates deeper socio-psychological problems of integration. A paper of S.Y. Skinner *et al.* (2024) showed that students with serious disabilities do not receive adequate support to fully participate in learning and that student involvement is largely limited by the social environment and culture of the classroom.

## MATERIALS AND METHODS

This study was conducted from the beginning of May to August 2024. It concentrated on teaching and shaping the knowledge of primary school students with intellectual disabilities and focused on the syllabic structure of words. The study was conducted in the 11<sup>th</sup> comprehensive resource centre of the Darnytskyi district of Kyiv. For this purpose, a sample of 30 students from the second to fourth grades with mild intellectual disabilities was created. The sample included 15 boys and 15 girls, which provided a balanced gender representation. The criteria for inclusion in the sample were as follows: participants were between the ages of 7 and 10, had a diagnosis of mild intellectual disability confirmed by medical records, and had the consent of their parents or legal guardians to their child's participation. The study involved teachers with at least 5 years of experience working with children with intellectual

disabilities. Each of them has special knowledge and skills that allow them to effectively teach children with different needs. Teachers have appropriate educational training and have been trained in the field of correctional education. During the study, teachers actively participated in the development and implementation of teaching methods that considered the individual characteristics of students. They used a variety of interactive and didactic materials to en-

courage learning, including games and creative tasks. All participants of the study demonstrated high professionalism and responsiveness to the needs of students, which contributed to creating a positive educational atmosphere. A sample was randomly generated among the centre's students to ensure the representativeness of the data and the possibility of gender analysis. This study was conducted in three stages, as shown in Table 1.

**Table 1.** Stages of the study

Stage	Description	Duration	Methods and tools
1. Assessment of the initial level of knowledge	Diagnostic testing, which included tasks to determine the syllabic structure of a word. Testing was conducted in an interactive form using games, which encouraged students to actively participate	2 weeks	Test tasks, game forms of assessment, observation of participants
2. Formation of knowledge	Training sessions aimed at improving students' knowledge of the syllabic structure of a word. Classes were organised with an emphasis on students' gender preferences, which provided high motivation to learn	8 weeks	Vocabulary games, art therapy, didactic materials, active forms of work (group tasks, discussions)
3. Analysis of results	Processing of data obtained as a result of testing at the beginning and end of the educational process. Assessment of changes in students' knowledge and an analysis of the impact of gender on learning outcomes	1 week	Statistical analysis (Student's t-criterion, Fischer's criterion), comparison of average knowledge values between boys and girls

**Source:** compiled by the author

All stages of the study were conducted in accordance with ethical standards of Declaration of Helsinki (2013). Written informed consent was obtained from the participants' parents or legal guardians prior to the study. All student data was processed anonymously to ensure confidentiality and protect personal data. Statistical analysis methods were used to process the obtained data. In particular, the Student's t-criterion was used to compare students' average knowledge scores before and after training and analyse gender differences. The Fischer criterion was used to analyse the variance of the test results. This allowed identifying statistically substantial differences between boys and girls.

## RESULTS

In the initial stage of the study, diagnostic testing was conducted, which included a series of tasks to determine the level of knowledge of students about the syllabic structure of words. One of the key aspects of this stage was the identification of gender differences in task performance. Overall results showed that girls showed 3-4% better results in all task categories compared to boys, which was an interesting point for further analysis. Girls had the most noticeable advantages in tasks related to recognising the number of syllables in words, while boys showed slightly worse but still substantial results in other tasks, in particular, in dividing words into syllables. The results of syllable recognition tasks showed that girls, on average, understood and performed better on these tasks. Their success can be explained by several factors. Firstly, the speech skills of girls tend to develop faster than those of boys, especially at a

younger age. Studies in the field of children's speech development show that girls master speech at a younger age and are more verbally active than boys. This phenomenon is associated with biological, cognitive, and social factors that affect the development of language skills in various states. Girls most often start speaking earlier than boys and are more likely to use more complex language constructions. They develop vocabulary better in early childhood because cognitive functions associated with speech activity develop faster. Neuroscientists have shown that girls develop more actively the parts of the brain responsible for speech, which gives them an advantage in the early stages of speech development. This factor may explain the higher level of skills in performing syllable recognition tasks. Notably, the girls showed a greater ability to concentrate during tasks, which is especially important for tests for recognising the constituent elements of a word. This task requires not only an understanding of the sound elements but also a certain level of attentiveness and the ability to analyse in detail. Girls' higher scores in this task category may indicate their better ability to process and analyse phonetic information. The boys, although they showed slightly worse results, still showed a fairly high level of task completion. Their weak point was lower accuracy in determining the number of syllables, which may be due to less attention to detail or lower levels of speech development compared to girls at this stage. However, it is important that this difference was insubstantial and did not affect the overall picture of the boys' results. The task contributed to the development of critical thinking and the expansion of students' vocabulary, as they had the opportunity to work with language material

at a deeper level. On average, girls showed slightly higher results on all indicators compared to boys, which may be

due to the girls' natural propensity for speech skills at a younger age. Detailed results are presented in Table 2.

**Table 2.** Initial student test results, %

Tasks	Overall result (%)	Boys (%)	Girls (%)
Recognising the number of syllables	63.3%	60%	66.6%
Forming words with addition/subtraction of syllables	56.6%	46.6%	73.3%
Dividing words into syllables	60%	60%	40%

**Source:** compiled by the author

The results of the conducted studies indicate differences in the speech abilities of primary school boys and girls, as well as the overall level of development of children's speech abilities. An analysis of the three tasks received by students shows a clear trend. The first task that the students set was to determine the number of syllables in a word. From the overall results of the students, it can be concluded that the majority of children coped very well with this task and achieved an average of 65%. This shows that they have developed a basic ability to recognise syllable numbers and can successfully apply these skills in practice. However, differences in the results of boys and girls on this task indicate specific gender characteristics. The percentage was 60% for boys and 66.6% for girls. This confirms a general trend often seen in similar studies, which suggests that girls at a younger age perform better on tasks related to language and voice manipulation. Notably, girls are better able to perform syllable recognition tasks due to their innate propensity for speech activity. At a younger age, girls usually communicate more with adults, actively socialise, and participate more often in speech games, which can contribute to a better development of vocal skills. Since they recognise sounds better, they can more accurately determine the number of syllables in a word. This factor can also be explained by biological features of brain development when girls develop a zone responsible for speech functions earlier.

The second task was more complex and required adding or subtracting syllables to form words. Scores for this task were lower than for the first task, averaging 56.6%. This can be explained by the fact that this task required higher levels of conversational skills, analytical skills, and strong critical thinking. Students had to not only recognise syllables but also use language structures to create new words to complete this task. Analysis of the results again showed that girls performed better (73.3%) than boys (46.6%). This difference supports previous findings that girls perform better on tasks that require a detailed understanding of language structure and phonetic elements. In addition, such exercises also contributed to the development of critical thinking, as students had to analyse how words change when syllables are added or removed, which requires a deeper linguistic analysis. The critical thinking element is very important in this task. When forming words, students had to understand the mechanism of addition and subtraction of syllables and also apply this knowledge to form new words, which substantially expanded the

field of speech. As this task involved the active formation of language units, students were encouraged to think at a higher level than just recognising syllables. For children, the results of this task may indicate that in the early stages of learning, they are less active in using linguistic resources to solve problems that require analytical thinking. This may be because other cognitive processes in boys develop earlier than language processes, and they are more focused on practical tasks that involve different ways of thinking.

The third task, dividing words into syllables, gave an average result of 60%. This indicates that the vocal training of students is at a fairly high level. As in the first task, this task required students not only to recognise the number of syllables but also to actively participate in syllable segmentation, which is an important element in developing oral skills. Analysis of the results of boys and girls shows that the latter still have a certain advantage. The achievement rate was 40% for girls and 60% for boys. Although this difference is small, it still suggests that girls better understand the phonetic structure of words. This may be due to girls' general propensity for verbal activity and higher levels of vocal communication at an early age. In addition to the results of performing specific tasks, it is also important to consider the overall impact of the study on the development of students' linguocognitive skills. The tasks set contributed not only to the development of vocal skills but also to the active integration of critical thinking and analytical skills. Working with language material at a deeper level allows students to reproduce ready-made language constructions and actively create new ones, which substantially contributes to the expansion of vocabulary and overall speech development. Often, girls start actively communicating earlier, spend more time playing speech games, and communicate more often with adults, which contributes to the development of speech skills. On the other hand, boys may spend more time playing games that don't require active language involvement, which can slow down their development in this direction.

The second stage of the study is a series of training sessions based on interactive methods, vocabulary games, and creative tasks. This stage was aimed not only at improving students' knowledge of the syllabic structure of words but also at stimulating their activity and interest in learning by engaging in various forms of activity. The training programme was carefully designed to consider the individual characteristics of each participant, including cognitive abilities, gender characteristics, and the level of



intellectual disability. This allowed adapting the learning process as much as possible to the needs of each child, which became an important condition for effective assimilation of the material. One of the critical components of the training programme was interactive exercises. They included tasks to recognise syllables in words using visual and audio stimuli. Such exercises allowed students to work with different types of information (visual and auditory), which helped develop their skills in processing complex speech information. For example, students were asked to listen to audio recordings of words, divide them into syllables, and relate what they heard to visual images that depicted the appropriate number of syllables. These exercises were useful for developing auditory attention and the ability to recognise different sounds in speech, which is an important aspect of teaching children with intellectual disabilities.

In addition, interactive methods helped increase students' interest, as they were able to complete tasks in a playful way, which substantially improved their motivation. Another important element of the curriculum was vocabulary games. They consisted of exercises to build new words by adding or removing syllables from the provided base words. This approach contributed to the development of flexible thinking and speech skills, as students were able to experiment with different syllable variants, creating new words. This process helped students better understand the structure of the word and develop their ability to combine different speech elements. These exercises were especially useful for girls, who often showed a greater propensity for creativity in speech activity. In the course of vocabulary games, they actively used their imagination, creating new words and combining syllables in unexpected ways. This enhanced their speech activity and contributed to the development of phonemic hearing. Classes also included working in pairs or small groups, which allowed students to collaborate and interact with each other in the process of solving problems. Group tasks contributed not only to the assimilation of the syllabic structure of words but also to the development of social skills, such as the ability to communicate, share thoughts, and help others. This is especially important for children with intellectual disabilities because such students often have difficulties communicating with their peers. Group tasks were organised in such a way that each student had the opportunity to contribute to the work of the group. Children who usually had a better understanding of structured tasks were offered clear instructions and logical exercises where they could apply their skills to dividing words into syllables. The girls, in turn, were given the opportunity to work on creative tasks that required more flexible thinking and imagination. Special attention in the programme was paid to art therapy methods, such as creative tasks, which were aimed at stimulating the imagination and emotional involvement of students. These tasks were mainly used for girls, as they often show a greater interest in creative and artistic forms of activity. For example, students could draw words as sym-

bolic images or create associative word cards that included both visual and speech components.

Art therapy helped children express their emotions and experiences through drawings, which had a positive effect on their motivation to learn. In addition, such tasks contributed to the development of motor skills and visual perception, which are important components of speech activity. An important feature of the curriculum was that it was designed with students' gender characteristics in mind. Children were given an advantage in active game tasks, which allowed them to stay involved in the process and maintain motivation to learn. Word division games, logic exercises, and interactive tasks helped them better perceive learning material, which was due to their penchant for structured and clear tasks. Girls, for their part, were more involved in tasks with a creative component. Creative tasks allowed them to show their imagination and use their own imagination to perform exercises to create new words or work with associative cards. This suited their learning style, as girls usually showed a greater interest in speech, communication, and creative expression. Due to the use of interactive and creative methods, it was possible to ensure a high level of student involvement in the educational process. Classes were organised in such a way that each participant could actively take part in the exercises, working individually, in pairs or in groups. The combination of different methods allowed considering the individual characteristics of students, which contributed to better assimilation of the material. Gender-based approaches, which included game tasks for boys and creative exercises for girls, also helped increase students' motivation. Children who usually showed more interest in outdoor and interactive activities were willing to participate in vocabulary games and tasks for dividing words into syllables. Girls, in turn, were actively involved in creative tasks that required the use of imagination and creativity.

The second stage of the study demonstrated the effectiveness of interactive and creative methods in teaching children with intellectual disabilities. Interactive syllable recognition exercises, vocabulary games, and art therapy helped students better assimilate the material, develop speech skills, and increase interest in learning. The use of gender-adapted methods helped maintain motivation in both groups of students, providing different approaches to learning that were consistent with the interests and characteristics of both boys and girls. Evaluation of results after the educational process was identified to be a key component of the study, as it allowed analysing the impact of educational methods on the level of knowledge of students with mild intellectual disabilities. After completing the eight-week training phase, repeated testing was performed, which included the same tasks that were used during the first stage of diagnostic assessment. This provided an opportunity to compare changes in students' knowledge and evaluate the effectiveness of interactive and creative methods used. An overall analysis of the results showed that all study participants showed a substantial



improvement in performing tasks related to the syllabic structure of words. The average increase in results ranged from 20 to 23%, which is a substantial indicator of the effectiveness of implemented training methods. Such a high increase in knowledge can be explained by several factors: an interactive approach to learning, adaptation of methods to individual characteristics of students, gender-differentiated tasks, and high motivation of children due to the game and creative components of classes. A substantial increase in knowledge was observed in all three main categories of tasks. Notably, students showed a noticeable improvement in the ability to correctly determine the number of syllables in words both by ear and visually. This task was one of the most important for the development of phonemic hearing and understanding of the structural elements of speech. The results in this category show that the use of visual and sound stimuli during learning substantially improved students' ability to recognise the number of syllables, which is a critical component in developing speech structure analysis skills. In addition, students began to perform substantially better tasks in dividing words into syllables, which indicates the development of skills in the structural analysis of words. This aspect of the study highlights the importance of a systematic approach to teaching speech elements since the division of

words into syllables is one of the basic components for the further development of speech activity and literacy of students. The improvement in this category can be explained by the use of interactive exercises and group tasks, which activated children's work and helped them better understand the syllabic structure of speech. In addition, the task of creating new words by adding or subtracting syllables, which requires creativity and speech flexibility, also showed a noticeable improvement. This is especially true for students who had lower initial results. Engaging creative elements such as vocabulary games and associative exercises helped students develop the ability to work flexibly with syllabic words, which is important for developing speech creativity and adaptability in a learning environment. Thus, the results showed that the educational process had a positive impact on all aspects of the development of students' speech activity, which confirms the high effectiveness of the methods used.

After completing the training process, repeated testing was conducted with similar tasks as in the first stage. The results showed a substantial improvement in the level of knowledge in all participants. The average increase in results ranged from 20 to 23%, which indicates the effectiveness of the method used. Table 3 shows the results of boys and girls after training.

**Table 3.** Results of boys and girls after training, %

Indicators	Boys (%)	Girls (%)	Differences (%)
Recognising the number of syllables	80%	86.6%	+6.6%
Forming words with addition/subtraction of syllables	73.3%	80%	+7.3%
Dividing words into syllables	80%	93.3%	+13.3%

**Source:** compiled by the author

This category of tasks allowed assessing how students of both sexes use their speech abilities and logical thinking to complete tasks. Building new words by adding or subtracting syllables this task revealed the most noticeable gender differences in student outcomes. The girls demonstrated a higher ability for creative thinking and flexibility in using the syllabic structure of words. They experimented more actively with adding and subtracting syllables, which allowed them to create new words, even if some of these words were unusual or little used. The boys, on the contrary, showed more caution in their answers and tended to stick to familiar and safer options. They were more likely to use words they already knew or had heard before and less likely to experiment with new syllable combinations. This may indicate

that boys are more focused on proven strategies, while girls tend to be creative and flexible in solving speech problems.

Several types of statistical analysis were performed: the Student's t-criterion to check the significance of differences between the average results before and after training to check the statistical significance of changes in students' knowledge. The obtained values showed that the difference between the indicators is statistically substantial ( $p < 0.05$ ), which confirms the effectiveness of the training activities conducted. The Fischer criterion was used to analyse the variability of results in groups. It showed that gender differences are not substantial, but confirm the overall trend towards better outcomes in girls. Table 4 shows the results of the statistical analysis in detail.

**Table 4.** Results of statistical analysis

Indicators	Value of the t-criterion	P-value	Fischer's criterion
Recognising the number of syllables	2.14	$p < 0.05$	1.85
Forming new words	2.65	$p < 0.05$	1.72
Dividing words into syllables	2.31	$p < 0.05$	1.93

**Source:** compiled by the author

As a result of the study, several important conclusions and recommendations aimed at improving the learn-

ing of children with mild intellectual disabilities can be drawn. Firstly, the use of interactive and creative teaching

methods has proven to be extremely effective in developing students' speech abilities. Interactive exercises, such as tasks for recognising the number of syllables in words, vocabulary games, and creative tasks, provided a high level of student engagement and encouraged them to actively participate in the learning process. This confirms the need for further implementation of such methods in the practice of teaching children with intellectual disabilities. It is recommended to further develop curricula with an emphasis on the individual characteristics of students, considering their speech capabilities and level of cognitive development. The use of gender-differentiated methods has also proved effective. In particular, active game tasks were more attractive to boys, while girls showed a higher level of engagement when performing artistic and creative tasks. Thus, educational tasks should be adapted to the interests and needs of each child, which will contribute to their better assimilation of the material.

Another important aspect to consider is the need to involve parents and guardians of children in the educational process. Family support can substantially increase students' motivation to learn and help consolidate their knowledge in everyday life. It is important to regularly consult with parents about their children's academic success and difficulties, providing them with recommendations on opportunities for additional support at home. Based on the results of the study, it can be concluded that to achieve successful results in teaching children with mild intellectual disabilities, it is necessary to use an integrated approach that combines interactive, creative, and socially oriented methods. For example, group tasks where students collaborate with each other contribute not only to the development of speech skills but also to the socialisation of students, which is an important component of their personal development. It is recommended to continue implementing elements of art therapy in the educational process, as they have proven to be an effective tool for increasing the involvement of students, especially girls, in educational activities. The use of visual and creative stimuli allows students to better assimilate complex speech information and develop their creative abilities.

Separately, the importance of constant monitoring and correction of curricula, based on the results of an intermediate assessment of students' knowledge, is notable. Regular diagnostic tests, such as sound recognition tests, help assess how many sounds or syllables a student hears in words, allowing them to identify gaps in knowledge in time and make appropriate changes to the teaching methodology, which will help ensure a more individualised approach to each student. An important factor is also the training of teachers working with children with intellectual disabilities. It is necessary to ensure the continuous professional development of teachers, in particular, in terms of using interactive and creative teaching methods and in the field of correctional pedagogy and psychology. This will help improve the effectiveness of the educational process and help teachers better adapt to the needs of their students.

As a result, the study confirms that interactive and creative teaching methods have a substantial positive impact on the development of speech skills of students with mild intellectual disabilities.

## DISCUSSION

The problem of teaching children with intellectual disabilities is one of the initial and simultaneously the most difficult tasks of modern pedagogy. It covers a wide range of issues related not only to teaching methods but also to socialisation, development of communication skills, and self-determination of such students. The specific feature of this category of children is that their cognitive processes have their own specific features: a decrease in the level of abstract thinking, the power of cognitive operations, difficulties in the formation of speech skills, and problems with the assimilation of new information. Accordingly, this requires the development of special programmes and approaches that would consider the individual development characteristics of such students as much as possible. In the context of modern education of children with intellectual disabilities, special attention is paid to the inclusion and adaptation of educational programmes.

Inclusive education ensures the integration of children with special needs into the general education process, where they have the opportunity to interact with their peers, receive help from teachers and assistants, and participate in general social processes. Therewith, the question arises about the effectiveness of such approaches in cases where children with intellectual disabilities cannot cope with the general education programme due to special difficulties because of their cognitive development. These tasks require the development of separate teaching methods adapted to the level of intellectual capabilities of children. Independence as a life skill is one of the key elements of successful social adaptation of such students. However, its development depends on the effectiveness of educational programmes, which should form the functional life skills necessary for a full life. This applies to aspects such as decision-making ability, ubiquitous tasks, and social interaction. It is important to use approaches based on the individual needs of students, their capabilities and strengths to do this.

In the modern world, there is a strong tendency to integrate such students into the overall social structure. However, this is often accompanied by certain problems, in particular, stigmatisation, misunderstanding on the part of society, and difficulties in communicating with peers. The role of teachers is important, as they are not only carriers of knowledge but also assistants who help children adapt to social norms and rules. Thus, G. Moljord (2019) conducts a content-analytical review of educational programmes for students with intellectual disabilities. The author identified key trends in curriculum development for this group of students, emphasising that cognitive academic content is the dominant area of research compared to functional life skills. The author emphasised the need for a discursive link between the normative framework of educational programmes

and the real needs of students for their further social integration. This study also concerns the problem of forming functional speech skills in children with intellectual disabilities. However, this study focuses more on the development of grammatical categories of adjectives and the sound-component structure of speech that reflect the practical needs of these children, while supporting the ideas of G. Moljord on the need for a cognitive and functional approach.

B.L. Kassah *et al.* (2018) examined special schools for children with intellectual disabilities in Ghana. They determined that these institutions play an important role in educating such students, despite the presence of international calls for universal education. The authors emphasised the positive impact of dedicated teachers, the variability of learning activities, and other factors that contribute to effective learning in special schools. However, the current study focuses on the details of speech development, while B.L. Kassah *et al.* (2018) cover more general education processes. V. Garrels & P. Arvidsson (2019) in their study practised the development of self-determination skills in students with intellectual disabilities from the standpoint of Vygotsky's approach. Researchers have shown that such skills can be developed through adequate social interaction with competent mentors and maintained by focusing on the need to adapt interventions to match the cognitive abilities of students with intellectual disabilities. This study also focuses on the social aspects of learning but more so on the methodology used, which improves the assimilation of grammatical constructions and speech skills.

P. Tan *et al.* (2019) analysed disability in the context of math education for people with intellectual disabilities. They underlined that research data in this area focuses on identifying shortcomings while humanising approaches to such students can improve their participation in the educational process. A.E. El Banna (2019) conducted a study on the impact of the multiple intelligence programme on improving reading skills in children with reading disabilities. The results show that methods based on multiple intelligence theory contribute to more effective development of reading comprehension, which may be important in the context of this study, which examines various aspects of language development. B.C. Elder & B. Kuja (2019) focused on inclusive education practices in primary schools in Kenya. The authors highlighted the importance of developing inclusive programmes that promote the involvement of students with disabilities in general education and ensure further integration of such approaches at the national level. In this study, Inclusion approaches are also important, but the accent is on specific methods of speech teaching, especially in specialised schools, rather than general education. O. Hrybiuk (2019) described the importance of creating intellectual development centres to improve the educational process at the conference. The author emphasised the importance of scientific and technical creativity in the development of students' intellectual abilities. While this study agrees with her approach to intellectual development, it focuses more on specific language and grammar

skills, which are crucial components of cognitive development in students with intellectual disabilities.

A.J. Harrison *et al.* (2019) analysed the impact of inclusive post-school education on students' explicit and implicit attitudes to intellectual disability. The authors concluded that students who participated in the volunteer programme when interacting with people with intellectual disabilities had lower levels of discomfort and negative stereotypes than students who did not have such experiences. Importantly, volunteers who worked with people with intellectual disabilities showed a deeper understanding of the causes of these disorders and were more open to social interaction with such people. This study shows that inclusive post-school education programmes have a positive impact on the formation of students' tolerant attitudes towards people with intellectual disabilities and contribute to their social integration. Comparing it with this study, some similarities and differences can be noticed. For example, the positive impact of adaptive teaching methods on the development of speech skills of students with intellectual disabilities was noted. However, the focus of this study is different, as it concentrates on the development of speech skills in primary school-age children, whereas A.J. Harrison *et al.* focus on high school students. However, both studies confirm the importance of social interaction and inclusive approaches in working with people with intellectual disabilities.

Another important study, conducted by M. Osei (2020), considers the effectiveness of learning strategies in teaching adaptive skills to students with intellectual disabilities in special schools in Hawaii. Other approaches, such as cooperative learning, direct learning, and interactive methods, were also used in this study. Consequently, he established that interactive and direct methods were most effective in developing adaptive skills in these students. In addition, teachers who applied a comprehensive adaptive skills development programme achieved better results in teaching children. The study highlighted the importance of regular professional development of teachers and the use of audiovisual materials to ensure high-quality education for students with intellectual disabilities. This study also used interactive and adaptive learning methods to develop speech skills in children with intellectual disabilities. Consequently, all of these studies complement their findings, highlighting the importance of adaptive learning methods, inclusion, and focusing on the real needs of students with intellectual disabilities.

## CONCLUSIONS

The study focused on the importance of developing language skills in children with intellectual disabilities and the methods and approaches that contribute to this goal. The results also suggest that teachers can use this information to form study groups and adapt their teaching methods. Periodic diagnostic testing is an important tool for identifying gaps in students' knowledge, enabling teachers to adjust the curriculum in a timely manner and ensure an individual approach to each student.

The key to success is the use of interactive and didactic methods that allow children to actively interact with the material. This may include game elements, critical thinking tasks, and working in small groups. This is especially important for children with intellectual disabilities. An important aspect of the study was the confirmation of the importance of social interaction in learning. The interaction between students and their teachers has a substantial impact on the development of oral skills. Cooperation and support of classmates create conditions for the exchange of experience, which contributes to the formation of even deeper knowledge and skills. Equally important is the focus on developing functional life skills in children with intellectual disabilities.

For further research, it is important to expand the sample to include students from different types of schools, including those with substantial intellectual disabilities. It is also necessary to analyse the impact of social, extracurricular, and family environments on the speech development of children with intellectual disabilities. Investigating the relationship between speech and communication skills can be the next step in further improving educational methods.

None.

None.

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## CONFLICT OF INTEREST

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### Валерія Михайленко

Аспірант, старший викладач

Український державний університет імені М.П. Драгоманова

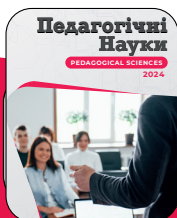
01601, вул. Пирогова, 9, м. Київ, Україна

<https://orcid.org/0000-0002-8318-2457>

## Складова структура слова: обстеження і формування знань в учнів з інтелектуальними порушеннями початкових класів

**Анотація.** Метою статті було дослідити формування звуко-складової структури мовлення учнів з інтелектуальною недостатністю на уроках української мови. Для досягнення поставленої мети використовувалася методика спостереження, тестування та анкетування. Об'єктом дослідження були учні з незначною розумовою відсталістю. Основна увага в дослідженні була зосереджена на розробці індивідуальних підходів, що враховують особливі потреби учнів, та інтерактивних методів навчання, спрямованих на стимулювання мовленнєвої активності, були використані дидактичні ігри та вправи для стимулювання мовленнєвої діяльності. Також досліджувалася роль дидактичних ігор, наочних посібників та вправ у розвитку мовленнєвих та граматичних навичок дітей з порушеннями інтелекту. Результати показали, що систематичне ознайомлення зі звуковою будовою слів та розвиток фонематичного сприйняття позитивно впливає на мовленнєвий розвиток розумово відсталих дітей. Учні виявили значні труднощі у розвитку мовленнєвих навичок, особливо у вживанні компонентного складу слів, за результатами. При роботі зі складними словами часто плутають кількість складів і оцінки. Повільно, але впевнено завдяки систематичному використанню дидактичних прийомів відбувався прогрес у розвитку фонетичного слуху та аналізі будови мовлення. Учні, які пройшли спеціально розроблені вправи, повинні значно покращити свої мовні здібності. 75% учнів, які брали участь у дослідженні, показали покращення розуміння звуко-складової структури слів, що підтверджено статистичними даними. Існують певні фактори, які перешкоджають навчальному процесу, зокрема недостатня увага до розвитку комунікативних навичок у навчальному процесі. Необхідно забезпечити індивідуальні особливості кожної дитини з метою вдосконалення мовленнєвого розвитку дітей з інтелектуальною недостатністю. В отриманих результатах можна знайти основу подальших корекційних програм у сфері спеціальної освіти

**Ключові слова:** мовна еволюція; інклюзивна освіта; корекційна педагогіка; ігрові методи; соціальна інтеграція



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**Maryna Kiryanova\***

Teacher

Poltava State Medical University

36011, 23 Shevchenko Str., Poltava, Ukraine

<https://orcid.org/0000-0001-6732-9239>

## The educator's information and digital competence as a foundation for professional success in the context of the information and educational environment

**Abstract.** Information and digital competence has become a key component of an educator's professional success, as it facilitates the integration of innovative approaches into teaching and align with the needs of modern pupils. The purpose of this study was to assess the level of educators' digital competence and develop recommendations for its enhancement to ensure the effective use of digital technologies in education. The research was based on the application of theoretical methods, including analysis, synthesis, generalisation, and systematisation, which enabled the identification of current trends in the use of digital technologies in education. The empirical part of the study involved a survey conducted among educators working in general secondary education institutions. Special attention was given to the role of digital competence in ensuring the effectiveness of the teaching and learning process within the dynamic development of digital technologies. It was found that information and digital skills not only enhance pedagogical expertise but also create favourable conditions for integrating innovative approaches into teaching. Such competencies enable educators to adapt teaching methods to the needs of modern pupils, who are shaped by a digital environment and accustomed to the active use of technology in their daily lives. The survey results revealed the extent to which teachers utilise digital tools in developing educational materials, organising interactive lessons, and integrating information and communication technologies into the learning process. This study identified the level of educators' digital competence and highlighted key challenges in implementing digital technologies, including insufficient technical support, the need to improve knowledge and skills, and a lack of educational resources. The practical value of the article lies in the potential use of the findings to develop targeted professional development programmes for educators, aimed at enhancing their digital literacy and facilitating the effective integration of technology into the teaching and learning process.

**Keywords:** educational space; learners competence; educational workers; information society; digital technologies

### INTRODUCTION

The modern era is characterised by the rapid development of information technology, which is steadily making its mark on all aspects of society, including education. The increasing accessibility of information and the use of innovative technologies are transforming learning and the educational process, thereby presenting new challenges and

opportunities for contemporary education. Under these conditions, the question of an educator's professional success is becoming increasingly relevant and inextricably linked to their ability to possess digital competence. This is defined not only by the ability to use modern technical devices but also by a deep understanding of the digital

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\*Corresponding author



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environment, its capabilities, and challenges. It is a key element for the successful implementation of innovations in the educational process, creating a stimulating and dynamic environment for pupil development. In this context, the digital competence of educators becomes a necessary component for the formation of a creative and competitive educational space.

Information and digital competence is one of the key components of a contemporary person's professionalism. In the context of globalisation and rapid technological advancement, it has become indispensable for effective functioning across various spheres of life. The ability to effectively use digital tools and work with information not only contributes to increased productivity but also ensures competitiveness in the job market. Digital competence encompasses more than just the ability to operate digital tools; it also involves the capacity to effectively use information to solve various problems, analyse data, and make informed decisions. O.M. Trifonova (2020) argued that in a world where digital technologies permeate all aspects of life, the development of this competence is a prerequisite for successful activity in both professional and personal spheres. It forms the basis for adapting to a rapidly changing environment and opens up new opportunities for learning, communication, and self-development.

Analysis of scholarly and pedagogical literature has revealed the existence of research within the Ukrainian academic sphere dedicated to the development of information and digital competence in various professional groups. For instance, O. Semenog *et al.* (2022) focused on developing this competence among future naval officers in non-formal educational settings. A. Barbinova (2022) analysed the specifics of developing digital competence among future educational managers within the context of innovative educational activities, emphasising the importance of this competence for the effective management of educational processes and the implementation of new technologies in educational practice. O.V. Silkova & N.V. Lobach (2021) investigated the development of digital competence among students of higher medical education institutions, particularly in the context of studying medical information systems, enabling the training of specialists capable of effectively working with digital technologies in the medical field. O.P. Kirdan (2019) concentrated on developing this competence in the process of professional training for future economists, underlining the importance of digital skills for analysing financial data and making strategic decisions in the field of economics. All of these studies attest to the significance of developing digital competence in various professional spheres as a necessary condition for successful activity in the modern world.

Therefore, the development of digital competence becomes an interdisciplinary task that encompasses a wide range of professional fields. The modern era, characterised by the rapid development of information technology, is steadily influencing all aspects of society, including education, and places increasing demands on the effective use

of digital technologies in professional activities, which is a determining factor in ensuring the quality of specialists' work. The growing accessibility of information and new technologies is transforming the learning process, presenting new challenges for education. An educator's professional success now hinges on digital competence, which encompasses not only the ability to use technology but also an understanding of the digital environment. This is necessary for implementing innovations in teaching and creating a dynamic learning environment. Consequently, the importance of digital technologies in education is increasing, and research on this issue is becoming increasingly relevant.

An educator's information and digital competence is one of the key aspects of modern education, actively studied in the context of society's rapid technological transformation. As M.V. Sapogov (2020) argued, this competence not only ensures the effective use of new technologies in the teaching process but also serves as a powerful tool for developing critical thinking, creativity, and a teacher's ability to adapt to the challenges of the digital world. It is precisely these qualities that make an educator competitive, able not only to keep up with technological changes but also to create conditions for the comprehensive development of pupils. Despite the widespread scientific interest in the problem, the issue of developing an educator's digital competence remains multifaceted and requires further research. As research has shown, contemporary studies cover various aspects of this topic: from methodological approaches to developing competence in future educators to the implementation of digital tools in the teaching process.

However, many aspects remain insufficiently studied. Moreover, the rapid pace of technological change and the diversity of digital tools create new challenges that make it difficult for educators to adapt to the modern environment. In this context, there is a need to develop innovative approaches to educator professional development that take into account both the technical and pedagogical aspects of their work. Thus, despite significant progress in studying this problem, it remains open for further scientific research and practical implementation. Therefore, this article aimed to investigate an educator's information and digital competence to develop professional skills and create conditions for effective learning in a digital environment.

## MATERIALS AND METHODS

The research comprises theoretical and empirical sections, each with its specific characteristics and research methods. The theoretical part was based on the use of analysis, synthesis, generalisation, and systematisation methods. The method of analysis allowed for the examination of existing scientific approaches and theoretical concepts related to digital technologies in education, as well as the identification of key problems and trends. Synthesis made it possible to combine different aspects of the research topic and create a holistic picture of the use of ICT in pedagogical practice. Generalisation allowed for drawing conclusions based on the data considered, which helped to identify

the main patterns in the development of educators' digital skills. Systematisation was used to structure and order information from various sources, which allows for a clear distinction between concepts and ideas related to teachers' digital competence.

The empirical part of the research aimed to study the level of digital technology use among educators in general secondary schools in Poltava. The main stages of the research included: preparation, data collection, analysis, processing of results, and formulation of conclusions. At the preparatory stage, the research aim was defined, which was to identify the characteristics of the use of digital tools by educators, and a survey method was chosen to collect data. Educators with varying experience, age characteristics, and specialisations were involved. In September 2024, an anonymous online survey was conducted among 50 educators aged 25 to 62. This approach ensured the representativeness of the collected information for further analysis. The survey questions were focused on studying aspects such as the use of digital tools in professional activities, the creation of interactive tasks, the adaptation of educational materials to a digital format, the main difficulties in applying digital technologies, and the identification of educators' needs for their further development in this area. The data collection process was carried out in strict adherence to the ethical norms outlined in the Declaration of Helsinki (2013). All participants were previously informed about the purpose of the research and the use of their responses solely for scientific purposes. The survey results made it possible to determine the current state of educators' digital competence, the main challenges in its implementation, and promising directions for the development of professional development programs.

## RESULTS AND DISCUSSION

The education sector is undergoing dynamic changes driven by the impact of information technology, which influences the process of knowledge acquisition and the development of personal competencies. Digital technologies have the potential to foster more inclusive and sustainable development, stimulate innovation, and enhance the effectiveness of educational services. Moreover, they have become a crucial tool for learning during the COVID-19 pandemic, which negatively impacted society worldwide and the education sector in particular. In the current context, leveraging the benefits of digital transformation is essential for job creation, providing access to educational services, and addressing potential challenges. The modern information society is a significant driver for the development of industry, education, and culture, particularly in the context of computerisation, informatisation, and automation of all spheres. As a result of digital transformation processes in societies, the education sector faces several challenges. Among them are ensuring access to quality educational content, the need to modernise outdated teaching methodologies, the readiness of learners to become part of the new workforce in the future, the rapid increase in living

costs, the need to maintain affordable tuition fees, and the growing rejection of traditional approaches and methods of teaching among the new generation of young people.

Within the education system, schools serve as a crucial stage in the formation of a modern, competitive individual who is not only a participant in the educational process but also a future citizen, an active participant in social, economic, and political processes and reforms in the country. Consequently, one of the key objectives for the education system and the state as a whole is the active development of an information and digital environment in educational institutions. This is a necessary condition for integrating the latest technologies into the educational process, providing access to knowledge, improving the quality of education, and creating conditions for the continuous development of pupils and educators in the digital space. In this context, O.S. Storonska (2023) highlighted the importance of organising and developing a digital learning environment, emphasising its significance in the context of current transformations in the education sector, particularly through the implementation of innovative approaches and technological solutions that contribute to the modernisation of the learning process and ensure interactive interaction between participants in the educational process.

In the methodological manual written under the guidance of O.V. Ovcharuk *et al.* (2022), the information and digital learning environment of a general secondary education institution is considered "as a systematically organised set of information, technical, and educational-methodological support for general secondary education institutions (GSEIs), aimed at organising the interaction of pupils, teachers, school leaders, and the public, as well as carrying out educational and upbringing influences supported by digital means of data collection and transmission, hardware and software, and teaching and methodological support".

An information and digital environment is a domain where people, technology, and information resources interact. It is defined by the availability and use of digital technologies, information systems, and communication tools for collecting, processing, transmitting, and utilising information. In an information and digital environment, rapid information exchange, the use of electronic communication tools, access to online resources, and the use of digital tools to solve problems are the primary elements. This environment fosters the development of information technology skills, promotes effective communication, and expands opportunities for learning, working, and interacting in various spheres of life.

Therefore, it can be argued that the information and digital environment of educational institutions is a complex of technological, organisational, and methodological resources that ensure the effective use of ICT in the educational process. It includes both hardware (computers, multimedia devices, network resources) and software (educational platforms, electronic textbooks, digital tools for learner interaction), as well as internet resources that allow



for organising access to information and providing interactive forms of learning. Such an environment contributes to the development of digital skills in educators and pupils, supports inclusivity and accessibility of education, and creates conditions for lifelong learning and self-education in the context of digital transformation.

According to the Concept of Digital Transformation of Education and Science until 2026, the creation of a unified digital environment that connects all subjects of educational and scientific activities will facilitate communication and data exchange. This will simplify management processes and significantly reduce the bureaucratic burden in the education and science system. One of the tasks of the concept that will contribute to the creation of an information and digital environment is to provide educational institutions with computer equipment and software (Concept of digital transformation..., 2021).

At the end of 2024, Russia's active aggression against Ukraine, which began in 2014 and intensified after the invasion of Russian troops into Ukrainian territory on 24 February 2022, is still ongoing. From the first days of the conflict, Ukraine suffered significant losses in all regions of the country, both in terms of human potential and infrastructure, including the destruction of educational institutions. Many pupils and students are unable to attend educational institutions, and teachers face significant difficulties and even a complete loss of the ability to organise the educational process. Moreover, access to electronic educational resources for those in occupied territories is limited and often impossible. Under such conditions, the issue of developing an information and educational environment in educational institutions and ensuring access to it for all participants in the educational process becomes particularly important. The use of information and communication technologies is an effective solution to this problem.

In the dictionary *Information and Communication Technologies in Education*, the term "information and communication technologies" is defined as a set of methods, tools, and procedures used for collecting, systematising, storing, processing, transmitting, and presenting various messages and data using computer technology and communication means (Information and communication..., 2019). When considering information and communication technologies in the context of education, according to the same dictionary, this concept is viewed as a complex of methods, techniques, production processes, and software and hardware tools that are integrated to develop information and digital educational systems, create electronic educational resources (EER), and build communication networks. ICT in education also includes technologies for solving learning tasks using these systems, resources, and networks, which contribute to the optimisation of the learning process, provide access to information, and allow for effective interaction between participants in the educational process through digital platforms and resources. Thus, ICT in education is the foundation for creating innovative, interactive forms of

learning that provide a personalised approach to each pupil and also open up new opportunities for educators in planning and conducting lessons.

The comprehensive implementation of ICT in the educational process and management of educational institutions and the education system as a whole should become a key element in ensuring the success of the reform known as the "New Ukrainian School", which is a key initiative of the Ministry of Education and Science. In the education sector, the application of information and communication technologies should evolve from individual projects to a systemic approach that covers all aspects of activity, as this will contribute to expanding the capabilities of educators, optimising management processes, and fostering the development of important technological competencies among pupils, which are key to the modern world.

According to the *Conceptual Foundations of Secondary School Reform* (2016), the main goal of the aforementioned reform is to create schools where learning is enjoyable, and pupils acquire not only theoretical knowledge, as was the case before but also the skills to apply it in real life. This is why the modern world, which is complex and rapidly changing, requires children not only to acquire information but also to be able to use it effectively. It is important to note that the "New Ukrainian School" aims not only to transmit knowledge but also to teach pupils to apply this knowledge in various situations of everyday life. Given the complexity and diversity of the modern world, this reform places a primary emphasis on the development of pupils' life skills. These competencies include not only academic knowledge and skills but also values and orientations necessary for successful self-realisation in life, learning, and work.

The *Concept of the New Ukrainian School* (2016) defines 10 key competencies that form the foundation for the comprehensive development of pupils. Each of these is developed by children while studying various subjects at all stages of education (Hrynevych *et al.*, 2016). These competencies are marked by the need for personal realisation, development, an active civic stance, social inclusion, and employment, as well as the ability to ensure personal fulfilment and lifelong success. These competencies also include the information and digital competence of learners. According to the *Conceptual Foundations of the New Ukrainian School* (2016), information and digital competence involves the ability to confidently and simultaneously critically use information and communication technologies to create, search for, process, and exchange information in a work environment, in the public sphere, and personal communication. This competence includes information and media literacy, the basics of programming, algorithmic thinking, database management skills, knowledge of internet safety and cybersecurity, as well as an understanding of the ethical aspects of interacting with information, such as copyright, intellectual property, and others.

Therefore, given the challenges of the modern world, pupils need a teacher who can not only impart knowledge



but also teach children how to use it effectively. The knowledge and skills acquired should interact deeply with the values of each child to form the vital competencies necessary for successful self-realisation in learning, life, and career. Educators working with modern pupils must have the knowledge to help them solve problems that arise in the digital environment, such as information overload, privacy breaches, plagiarism, protection from online fraud, cyberbullying, and so on. The development of pupils' information and digital competence will only be facilitated by teachers who themselves possess the relevant skills and knowledge in this area. Such educators act not only as intermediaries in the transmission of theoretical knowledge but also as guides in teaching pupils practical skills in working with information technologies. They open up a world of innovation and creativity for pupils, fostering critical thinking and the ability to effectively use information resources. Therefore, the competence of educators in the field of information and digital technologies is an important factor that ensures the successful development of pupils' information and digital literacy.

Educators who possess information and digital competence have the ability to create a stimulating learning environment where pupils can experiment, create, and solve real-world problems using information technology. This promotes active pupil engagement in the learning process and a deeper understanding of information world concepts. Therefore, the professional skills and knowledge of teachers in the field of information and digital competence determine not only the level of education quality but also the readiness of young people to solve problems in today's information society.

In the methodological manual written under the guidance of O.V. Ovcharuk *et al.* (2022), it is noted that one of the priority directions of teachers' professional development is to increase their digital competence and ability to effectively use the information and digital environment. The authors emphasise that an educator's digital competence includes the ability to apply various tools of the information and educational environment, such as computers, software, and networks (local and global), as well as the ability to integrate these technologies into pedagogical activities. A high level of digital competence among teachers is critically important for the effective use of the information and educational environment in the learning process and is one of the main criteria for the success of their professional activities. In addition, this level is an important factor for the further development and improvement of teachers' professional competence. The information competence and media literacy of an educator who is oriented in the digital environment helps them become a full-fledged participant in social, economic, and cultural life. Such a teacher will support and encourage pupils to be active and responsible for their actions, contributing to the formation and development of their information and digital competence.

Within the scope of this research, there is a need for a detailed examination of the structure of educators'

information and digital competence, as this analysis allows for a deeper understanding of the complexity and diversity of the requirements placed on teachers in the context of the modern information society. Unpacking the components of this competence will help identify areas in which educators need to enhance their skills and knowledge, thus supporting more effective integration of digital technologies into teaching and assessment processes. Researching individual aspects, such as the ability to work with information resources, proficiency in technical tools, the ability to conduct critical analysis, and other key aspects, will help create a complete and comprehensive picture of the level of educators' competence in this context. To examine the structure of educators' information and digital competence, it is necessary to analyse the literature covering theoretical approaches, its components, and methods for developing digital skills in pedagogical activities. This will help to form a clear understanding of the main components of educators' information and digital competence, identify effective methods for its development, and the impact of digital technologies on the educational process.

When studying the structure of information competence, Yu.S. Zaporozhtseva (2019) identified three main components: *the information component*, which determines the ability to effectively work with information in any form of its presentation; *the computer or computer technological component*, which defines the skills and knowledge required to use modern computer tools and software; and *the applicability component*, which refers to the ability to apply information and computer technology tools to work with information and solve various tasks. These components form the foundation of comprehensive information competence, which is essential for successful activity in the context of the modern information society.

Within this research, a significant role was played by the theoretical aspects outlined in the Methodological Recommendations on the Formation of Information and Digital Competence of Educational Workers (2022). These recommendations confirmed the author's belief that modern teachers should demonstrate professional communication and collaboration, using creative and innovative methods through digital technologies. It is important that they are aware of the functional features, limitations, consequences, and risks of using these technologies, as well as understand the general principles, mechanisms, and logic behind the creation of digital services. Their knowledge of the basics of the functioning and use of various digital devices, computer programs, and networks is also important. It should also be noted that these recommendations emphasise the importance of educational workers being aware of and adhering to the principles of security in the digital space. In addition, they should be able to critically evaluate the reliability and credibility of information sources, understand their impact on consciousness and personal development, and be aware of the legal and ethical aspects associated with the use of digital technologies.

In August 2024, the Professional Standard “Teacher of General Secondary Education Institution” was approved. Along with its previous versions, it structures and specifies the content of a teacher's information and digital competence by highlighting three broad areas: orientation, resources, and processes. Within these areas, the specific knowledge, skills, and abilities that a pedagogical worker must possess are clearly defined. Thus, the structure of information and digital competence according to the teacher's professional standard includes: “the ability to navigate the information space, search for and critically evaluate information, and operate with it in professional activities; the ability to effectively use existing and create (if necessary) new electronic (digital) educational resources; and the ability to use digital technologies in the educational process”.

Therefore, the analysis of the literature on this issue has led to the identification of the components of an educator's information and digital competence. These include: *the informationseeking component* – the ability to use various sources to search for information, as well as to critically assess and select the necessary data; *digital literacy of the educator* – the proficiency in digital tools, electronic devices, and software required for conducting educational activities; *the practical-activity component* – the ability to apply acquired knowledge and skills in professional practice, particularly in the development of digital learning resources and interactive tools. These components form the foundation for developing effective information and digital competence in educators, enabling them not only to successfully use technologies in the learning process but also to adapt effectively to the rapidly changing information environment. By developing these components, an educator can ensure innovative approaches to teaching, and integrate digital tools into the educational process, which enhances learning effectiveness and fosters critical thinking among pupils.

Thus, an author's understanding of the concept under investigation can be formulated as follows: an educator's information and digital competence is their ability to use information and digital technologies to effectively carry out the educational process, including gathering, processing, analysing, and transmitting information, developing digital thinking, mastering the fundamentals of information and communication technologies, as well as the ability to critically evaluate and use information with ethical responsibility.

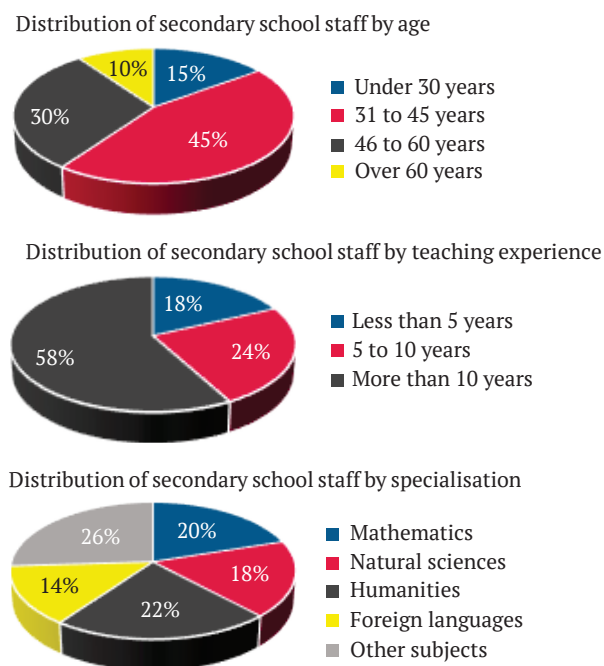
The formation of an educator's information and digital competence is a key task in the context of the modern educational paradigm, as contemporary education requires a high level of orientation towards information technologies and digital resources. M. Averkina & Yu. Lykshoststova (2023) expressed the view that a high level of this competence allows teachers to effectively use digital technologies for teaching and educating pupils. They can integrate interactive tools, virtual resources, and innovative methods into the learning process, creating engaging and informative lessons. In addition, thanks to their own information

and digital competence, educators can influence the development of pupils' ability to critically evaluate information, effectively integrating digital technologies into the learning process. They can create conditions for analysing and comparing different sources, verifying facts, and recognising manipulation, which contributes to the development of skills in searching, filtering, and evaluating information. E.Yu. Zheleznyakova & I.V. Zmiivska (2024) argued that by using digital platforms, educators teach pupils to apply tools for verifying content, such as fact-checking and analysing the reliability of sources. This not only contributes to the development of critical thinking but also prepares pupils for independent work with information, helping them make informed decisions in a digital environment.

Therefore, developing this competence becomes an important task for the modern educator, and this is supported by several key aspects. First, a high level of information and digital competence expands the possibilities for learning. Teachers who possess this competence are able to effectively use a variety of pedagogical tools, from interactive presentations to virtual laboratories, creating an engaging and innovative learning process. Second, the development of this competence allows educators to actively implement modern approaches to assessment and reporting, using electronic platforms and tools for convenient and objective assessment of pupils' learning achievements. This approach promotes individualised learning and creates conditions for the development of the intellectual and creative abilities of each pupil. Third, the increased use of digital resources contributes to the creation of a global learning environment, where pupils can communicate, collaborate, and exchange knowledge without being limited by geographical boundaries. This approach develops pupils' readiness for interaction in a world that is increasingly oriented towards technological development and global cooperation. Thus, the development of an educator's information and digital competence determines not only the success of learning but also the readiness of pupils for life in the modern world.

The theoretical research into the nature of educators' information and digital competence served as the foundation for conducting an empirical study. Within this study, which was focused on analysing the application of digital technologies in the educational process, a survey was conducted among 50 educators in GSEIs in Poltava. Figure 1 presents diagrams of the distribution of educators by age group, teaching experience, and subject specialisation.

According to the survey results, 15% of the participants were under 30 years old, 45% were between 31 and 45 years old, 30% were between 46 and 60 years old, and 10% were over 60 years old. In terms of work experience, 18% of participants had less than 5 years of experience, 24% had 5 to 10 years of experience, and 58% had more than 10 years of experience. Representatives of different subject specialisations were distributed as follows: 20% teach mathematics, 18% teach natural sciences, 22% teach humanities, 14% teach foreign languages, and 26% teach other subjects (physical education, arts).



**Figure 1.** Diagrams of the distribution of secondary school staff by age, teaching experience, and specialisation

**Source:** developed by the author during the research

Regarding the use of digital tools, the most common among survey participants were presentation creation programs (PowerPoint, Google Slides), used by 92% of educators, as well as web platforms for online lessons (Zoom, Google Meet), used by 76% of participants. Tools for creating interactive tasks, such as Kahoot, Quizlet, and Padlet, are actively used by 62% of educators. Text and graphics editing programs, such as Word, Excel, and Canva, are used by 84% of respondents. Only 34% of participants use other tools, including educational platforms such as Moodle. A large proportion of teachers (86%) indicated that they adapt teaching materials to a digital format. Specifically, this applies to textbooks, tests, quizzes, and interactive materials. 72% of educators adapt videos and presentations for lessons, 60% adapt interactive tasks and tests, and 68% adapt textbooks and workbooks.

Among the main challenges faced by teachers when using digital technologies, the largest proportion is the lack of time to learn new technologies and implement them in the teaching process (66%). Technical problems, including the lack of necessary equipment or connection failures, were reported by 56% of participants. Psychological barriers, such as fear of new technologies and low self-confidence, were indicated by 40% of respondents. Lack of support from administration or colleagues was a problem for 22% of teachers. Regarding the needs of educators, 72% indicated that they need additional courses or training to improve their skills in using digital technologies. Technical support is desired by 50% of respondents, while 44% seek access to resources for selflearning. Administrative support is also important for 38% of participants. In terms of assessing

digital competence, 18% of educators consider their level to be high, 60% – average, and 22% – low. Most respondents noted that they want to improve their skills in working with interactive tasks and multimedia resources, as well as increase their confidence in using new technologies.

The survey results demonstrate a heterogeneity in the level of digital competence among educators, necessitating a differentiated approach to their professional development. The high level of activity in using basic digital tools, such as presentation software (92%) and online lesson platforms (76%), indicates that educators are adapting to the basic requirements of modern education. However, the relatively low level of use of tools for creating interactive tasks (62%) and educational platforms (34%) indicates a need to expand educators' skills in working with innovative technologies.

An important factor is the high percentage of educators (86%) who adapt teaching materials to a digital format. This indicates their readiness to implement digital solutions in the learning process. However, the unevenness in the implementation of certain technologies, such as the adaptation of video materials (72%) compared to interactive tests (60%), indicates a need for additional resources and learning opportunities. An analysis of the difficulties faced by educators highlights the key challenges of digital transformation in education. The largest proportion of respondents (66%) indicate a lack of time as the main problem, which requires a review of the organisation of the workload and the creation of conditions for learning new technologies. Technical problems (56%) indicate the need for investments in infrastructure, while psychological barriers (40%) point to the importance of motivational support and building educators' confidence.

The significant need for additional training (72%) is a signal for educational program developers and administrations of the need to create effective and accessible forms of professional development. Attention to training, technical support, and the provision of self-learning resources should become a priority in planning the development of teaching staff. Thus, the research results show that the development of educators' digital competence is not only a current challenge but also a key condition for improving the quality of education and its compliance with the requirements of the digital age. To achieve this, it is necessary to create more opportunities for teachers' professional growth in the field of information and digital technologies, including through the organisation of courses, training, and the provision of technical support. This will contribute not only to improving their digital skills but also to the more effective implementation of innovations in the educational process.

Numerous scientific research emphasise the importance of developing this competence among educators as a foundation for improving educational approaches, integrating innovative technologies into teaching, and ensuring the quality of education for pupils and students. This issue is widely explored in the studies of many Ukrainian scholars who examine various aspects of the formation of

information and digital competence of educational workers. Among the studies devoted to the information and digital competence of educators, the following are worth noting: M.O. Antonchenko (2018) investigated the essence of this concept in the context of postgraduate pedagogical education; T. Berezhna & N. Bessarab (2024) focused on the formation of information and digital competence of teachers for the implementation of the concept of the New Ukrainian School; O. Polyakova (2022) considered the information and digital competence of educators as the basis for introducing a culture of democracy into the educational process; O. Samborskaya (2019) studied the factors influencing the formation of this competence among future primary school teachers. O.Ya. Stoyka (2023) analysed the possibilities of developing information and digital skills in future educators in the context of distance learning; V.M. Stoma (2019) focused on the methodological foundations of forming this competence in students of natural science and mathematics specialties during professional training; L. Titova (2022) studied Ukrainian experience in developing information and digital competencies in future educators, while O.M. Trifonova (2018) compared foreign and Ukrainian approaches to this issue; O.V. Fonaryuk *et al.* (2022) emphasised the importance of teachers' information and digital competence for the successful implementation of e-learning in the student environment. Each author offers their own interpretation of the concept of "information and digital competence" and outlines its structural components, which are determined by different contexts of using this concept. Such a variety of approaches is determined not only by the specifics of professional activity but also by individual experience, scientific beliefs, and methodological approaches chosen by the researcher. Thus, the lack of clear agreement and a common understanding of this concept highlights the need for a deeper analysis to clarify its essence and significance in the modern information and digital environment.

### CONCLUSIONS

An educator's information and digital competence is a crucial foundation for achieving professional success in

today's information and educational environment. The ability to use information and digital technologies, develop digital thinking, work effectively with information, and demonstrate ethical responsibility are becoming key components of successful pedagogical activities in modern educational settings. Possessing these skills not only improves the quality of teaching and learning but also facilitates adaptation to rapid changes in the field of education, ensuring that educators maintain a competitive professional level. Developing educators' information and digital competence is a vital step in ensuring a high-quality and contemporary educational process where digital technologies are used to expand assessment opportunities and enhance the quality of learning. Thus, this research determines the importance of providing pedagogical staff with the necessary knowledge and skills to successfully integrate digital technologies into the assessment process, thereby influencing the quality and effectiveness of learning.

Based on the research findings, several challenges have been identified, including an insufficient level of proficiency in modern digital tools, a lack of systematic training and courses to improve digital skills, and a low readiness of some educators to integrate new technologies into the teaching process. In addition, there is a lack of support from school administrations in the implementation of information and digital technologies. In this regard, it is important to provide educators with more opportunities for professional development, including through the organisation of regular training courses, the creation of platforms for sharing experiences, and involvement in programs focused on the practical mastery of modern digital tools. This will allow them to increase their competence in using ICT and contribute to the more effective use of digital technologies in the teaching process. Future research prospects lie in studying the impact of educators' information and digital competence on their professional motivation and career development.

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### CONFLICT OF INTEREST

None.

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**Марина Кір'янова**

Викладач

Полтавський державний медичний університет

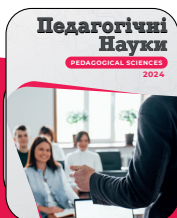
36011, вул. Шевченка, 23, м. Полтава, Україна

<https://orcid.org/0000-0001-6732-9239>

## **Інформаційно-цифрова компетентність педагога як основа його професійного успіху в умовах інформаційно-освітнього середовища**

**Анотація.** Інформаційно-цифрова компетентність стає ключовою складовою професійного успіху педагога, оскільки вона сприяє інтеграції інноваційних підходів у навчання та відповідає потребам сучасних учнів. Метою роботи було визначити рівень цифрової компетентності педагогів та розробити рекомендації для її вдосконалення з метою ефективного використання цифрових технологій у навчанні. Дослідження базувалось на застосуванні теоретичних методів, таких як аналіз, синтез, узагальнення та систематизація, що дало змогу визначити сучасні тенденції використання цифрових технологій в освіті. Емпірична частина дослідження охоплювала проведення опитування педагогів закладів загальної середньої освіти. Особлива увага приділяється її ролі у забезпеченні ефективності навчально-виховного процесу в умовах динамічного розвитку цифрових технологій. Визначено, що інформаційно-цифрові навички не лише сприяють підвищенню педагогічної майстерності, але й створюють сприятливі умови для інтеграції інноваційних підходів у навчання. Зокрема, такі компетентності дозволяють педагогам адаптувати методи навчання до потреб сучасних учнів, які формуються у цифровому середовищі та звикли до активного використання технологій у повсякденному житті. Результати опитування дозволили з'ясувати, наскільки активно вчителі використовують цифрові інструменти у створенні навчальних матеріалів, організації інтерактивних занять та загальній інтеграції інформаційно-комунікаційних технологій у навчальний процес. У межах даного дослідження окреслено рівень цифрової компетентності педагогів та виявлені ключові труднощі впровадження цифрових технологій, серед яких відсутність достатньої технічної підтримки, необхідність удосконалення знань і навичок, а також брак навчальних ресурсів. Практичне значення статті полягає у можливості використання отриманих результатів для створення цільових програм підвищення кваліфікації педагогів, які сприятимуть розвитку їхньої цифрової грамотності та успішній інтеграції технологій у навчально-виховний процес.

**Ключові слова:** освітній простір; компетентність здобувачі освіти; педагогічні працівники інформаційне суспільство; цифрові технології



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**Aida Sotiri\***

PhD in Education, Professor  
Eqrem Çabej University of Gjirokaštër  
6002, 30 Student Str., Gjirokastra, Albania  
<https://orcid.org/0009-0009-5404-0458>

## **Adaptation of didactic methods for children with special needs in primary education**

**Abstract.** The study aimed to address the adaptation of didactic methods for children with special educational needs in the context of inclusive education. The methodology included document analysis, comparison of teaching methods, observation of children's interaction with the adapted materials, and statistical analysis of the data. The study analysed statistics from the Albanian Ministry of Education on the number of children with special needs, the level of their integration into mainstream schools, and the provision of adapted teaching materials to schools. The analysis of educational standards and international recommendations, including the UN Convention on the Rights of Persons with Disabilities and UNESCO principles, was used to assess the role of regulatory documents in the development of inclusive education. Eight criteria covering objectives, structure, compliance with international standards and innovation were used to evaluate documents related to the adaptation of methods for children with special needs. Based on this assessment, the strengths and weaknesses of each document were identified, which became the basis for developing recommendations for improving inclusive education. The results of the study demonstrated the effectiveness of adapted didactic methods for children with special needs in different countries. Methods based on inclusive technologies, multisensory approach and differentiated learning provide a more accessible perception of the material and improve the learning process. Visual and tactile materials, as well as interactive technologies, contribute to the development of students with special needs and increase their activity in the learning process. The results also confirmed the need for further adaptation of educational programmes to ensure equal opportunities for all students. The practical significance of the study is determined by the improvement of methods and resources for teaching children with special needs

**Keywords:** pupil development; adaptation of learning; teaching methods; socialisation of children; complete education

### **INTRODUCTION**

Adaptation of didactic methods for children with special needs in primary education classrooms is an important aspect of ensuring equal opportunities for all students. Inclusive education involves creating conditions that enable every child, regardless of their physical, mental or emotional characteristics, to receive a full education. Consideration of specific needs of students is a key factor in developing effective teaching methods. As such, teachers should use individualised approaches that optimise the

learning process and ensure maximum development of students with special needs. In addition, teaching methods should account for the diversity of students, including children with hearing, visual, developmental and other physiological or psychological disabilities. This requires teachers to understand the specifics of each category of learners, as well as to have different tools and methods to adapt learning. In addition, it is important to use technologies and materials that help children better perceive

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\*Corresponding author



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information, as well as create a favourable psychological climate in the classroom.

Numerous researchers addressed the issue of adapting didactic methods for children with special needs in primary education classrooms. For instance, E. Avramidis *et al.* (2019) investigated the relationship between the attitudes of teachers towards inclusion, their self-esteem towards inclusive practices, and their willingness to implement mutual support methods among students. The authors highlighted the importance of supporting teachers in implementing inclusive practices to ensure equal opportunities for all students. M.E. Alonzo Rezabala & J.S. Villafuerte (2019) analysed adaptations in teaching children with special educational needs in the context of English as a second language, analysing methods that contribute to the successful implementation of inclusive education in the context of language barriers.

A. Bushati (2021) addressed the lack of attention to children with additional support in classrooms and the impact of this phenomenon on their learning opportunities in Albania. Y. Estevez Arias *et al.* (2022) highlighted the need to train teachers to handle the challenges of curriculum adaptation for inclusive education, as well as the need to develop their skills in this area. J.M. Fernández-Batanero *et al.* (2022) investigated whether primary school teachers have the necessary training to use technology when working with students with disabilities. S. Hassani *et al.* (2020) compared different approaches to organising school interventions that promote the participation of students with disabilities. F. Hellmich & M.F. Loeper (2019) investigated children's attitudes towards peers with learning disabilities and the role of parental behaviour and interaction experiences. F. Hellmich *et al.* (2019) investigated the role of teachers' attitudes and beliefs in implementing inclusive practice in primary school classrooms. O. Hnoievska *et al.* (2022) focused on techniques for adapting academic subjects for primary school students with special educational needs in Ukraine. J. Juvonen *et al.* (2019) explored the challenges and opportunities for promoting social inclusion in educational institutions, including the impact of the school environment on the integration of students with different needs.

The study aimed to develop a mechanism for the correct use of didactic methods for children with special needs in primary education classes. The objectives of the study were:

1. To analyse the existing approaches and methods of adapting curricula for children with special needs in primary education in Albania and compare them with those used in Greece and Italy.
2. To evaluate the effectiveness of using interactive platforms and text-enhanced learning materials in the process of teaching children with special needs in primary school in Albania.
3. To develop recommendations for improving didactic tools and methods to ensure more effective inclusion of children with special needs in primary education,

considering international experience and the needs of the national education system.

## MATERIALS AND METHODS

The analysis method was used to analyse statistics from World Vision (2021) on the number of children with special educational needs, the level of their integration into mainstream schools, and the provision of adapted teaching materials to schools. Educational standards and programmes aimed at inclusive education were analysed, as well as international guidelines, including the UN Convention on the Rights of Persons with Disabilities and the principles defined by UNESCO (2020; 2024) on inclusive education. The documents were characterised according to eight key criteria, used for a comprehensive assessment of their role in the development of adaptation of didactic methods for children with special needs. The first criterion was the goals and objectives of the documents that determined the strategic direction of their impact on education and inclusion. The second criterion was the structure of the documents, which assessed the logical construction, coherence and detail of the content. The third criterion was compliance with international standards, particularly the UN Convention on the Rights of Persons with Disabilities. The fourth was practical orientation, which reflected specific tools or methods proposed to achieve the goals. The fifth criterion was the coverage of the target audience, i.e., an analysis of the extent to which the documents considered different categories of children with special needs. The sixth was the accessibility of the materials, including their adaptation for practical use by teachers and school administrators. The seventh factor was feasibility and financial support, which assessed the ability of the documents to be implemented in the existing environment. The eighth was the innovativeness of approaches, which determined the level of interactivity and the use of the latest technologies in the methods described in the documents. These criteria were used to comprehensively assess both the strengths and weaknesses of each document, forming the basis for developing practical recommendations for improving inclusive education.

As part of the study, a comparative analysis of existing methods was conducted to adapt didactic methods in neighbouring countries, in Greece and Italy. In Greece, the method of synthesis was used to characterise the methodology "Employment of Technology for Inclusive Learning", which included adapted teaching materials and special pedagogical technologies to support children with special needs. In Italy, the Montessori Method was considered, which provided for a multisensory approach to learning using tactile, visual and auditory materials for the development of children with special needs using the descriptive method (American Montessori Society, 2024). Based on the case study in Albania, the methodology of "Differentiated Learning" was described, which was based on an individual approach to each student and the use of facilitated texts and visual materials to facilitate the learning process and improve the learning of the material. These methods were



chosen to provide a comprehensive approach that considered both theoretical analysis and practical experience, which was used to conclude optimising didactic approaches in primary education.

## RESULTS AND DISCUSSION

### The importance of inclusive education in primary school

Inclusive education is one of the key areas of development of the modern educational system, as it ensures the right of every child to equal access to knowledge and the opportunity to participate fully in public life. It is based on the principles of equality, fairness and recognition of diversity, creating conditions for children to learn regardless of their physical, cognitive or social characteristics. A particularly important stage is the introduction of inclusive education in primary school. During this stage, basic knowledge, skills and social competencies are formed, which are the basis for the child's further development. Primary school is the foundation for not only academic achievement but also for cooperation, communication and tolerance skills. Inclusive education at this stage not only opens opportunities for children with special educational needs but also contributes to their socialisation, adaptation and integration into the community. For all students, inclusion is a source of empathy, tolerance and understanding. It creates an awareness among children that diversity is an integral part of social life and that help, and support are important values. Co-education in an inclusive environment helps to overcome stereotypes and build a culture of mutual respect and solidarity. One of the most important aspects of inclusive education is the adaptation of teaching methods. This creates a comfortable learning environment for each child, considering the different individual needs of students. Children with different types of disabilities may require specific approaches to the pace of learning, learning formats or assessment methods. For instance, children with hearing impairments may need to use sign language, subtitled videos or interactive visual materials. Children with autism are supported through clear lesson structure, the use of visual timetables and gradual inclusion in group activities.

In terms of disability prevalence, approximately 10% of children aged 2-17 in Albania have significant functional impairment. These impairments cover aspects such as vision, hearing, mobility, learning and social interaction. The data is based on a World Vision (2018) survey of more than 13,000 families, which shows the scale of the problem. Many children face difficulties in communication and behavioural regulation. Access to services for children with disabilities in the country remains limited. The study determined that only a small proportion of children have access to the necessary medical, educational and rehabilitation assistance. The lack of a sufficient number of specialised educational institutions, limited resources and insufficient public awareness create barriers to the integration of children into society.

Concerning the quality of services provided to children with disabilities, the study determined a gap between theoretically proclaimed standards and their practical implementation. Parents highlighted the low level of professionalism of some staff, insufficient equipment of centres and the lack of long-term strategies to support children. These aspects point to the need to improve the quality of services, accessibility and effectiveness of support for children with disabilities in Albania. The analysis of the adaptation of curricula for children with special needs demonstrates a significant variety of approaches and methods used in different countries, including Albania. In Albania, the process of adapting curricula in primary education is based on international recommendations and national initiatives aimed at ensuring inclusion and access to quality education for all students. The support system for children with special needs is aimed at integrating them into mainstream schools and adapting the educational process to meet their needs.

One of the key approaches in Albania is the use of individual educational programmes. These programmes are developed for each student, depending on individual capabilities, needs and developmental characteristics. Individual educational programmes include the adaptation of teaching materials, changes in assessment methods, and the creation of flexible class schedules. In addition, the use of technology to improve access to information is emphasised, including specialised software, audio materials and devices for children with visual or hearing impairments. Albania is also implementing support systems for teachers and caregivers. Teachers are trained in inclusive education to develop their skills in working with children with special needs. At the state level, there are professional development programmes covering interactive teaching methods, communicative approaches and differentiated learning. These measures aim to create a favourable educational environment for children with disabilities. The integration of children into the social environment is of great importance. In Albania, there are programmes of involvement in extracurricular activities, including sports, artistic and cultural events. This contributes not only to socialisation but also to the development of key competencies in children, such as communication, teamwork and creativity. However, the provision of material and technical resources for curriculum adaptation is insufficient. Schools face limited access to resources, including specialised teaching materials and equipment. In addition, the level of teacher training in some regions of the country remains uneven, making it difficult to implement inclusive initiatives.

The practical experience of Albania shows that the implementation of adapted curricula is a complex but important process that requires a comprehensive approach. Successful adaptation depends on the coordination of efforts between government agencies, educational institutions, non-governmental organisations and parents. This experience can be a useful example for other countries seeking to ensure the inclusion of children with special needs in the educational process. An important element of adaptation

is the use of special teaching materials and technologies. These can include enlarged fonts for children with visual impairments, interactive tasks for students with attention deficit hyperactivity disorder or sensory games for children with motor disorders. Teachers in inclusive classrooms should have the skills to approach each child individually, developing programmes that address specific needs. Adaptation of didactic methods involves not only changing the way information is presented but also the methods of assessment. For instance, oral answers can be replaced by written assignments, and complex exercises can be replaced by a series of successive stages. It is important that children feel part of a team, even if their tasks or assessment methods are different. Inclusive education in primary school is not just a step towards equality, but a method for building a more open, supportive and humane society. It helps every child achieve their goals while remaining part of the community and lays the groundwork for positive change throughout the education system.

Documents such as the Convention on the Rights of Persons with Disabilities and Optional Protocol (2006) and Inclusion in Education: Leaving no Learner Behind (UNESCO, 2024) are important for the development of inclusive education, including for children with special needs. They define strategic guidelines for creating a system that guarantees equal access to quality education. In particular, the UN Convention emphasises the right of everyone to education without discrimination and the provision of conditions that consider the individual needs of students. The UNESCO document focuses on the implementation of inclusive approaches that help to avoid the exclusion of any category of children from the educational process.

These documents are based on structured principles that aim to ensure equality in education. They emphasise the need to create infrastructure adapted to the needs of children with disabilities, develop special curricula, and use interactive platforms and visual materials. Both sources offer specific recommendations for the involvement of educators, civil society organisations and government agencies in ensuring inclusion. The documents demonstrate a global understanding of inclusion as a necessity for sustainable societal development. They account for different social, economic and cultural contexts so that their recommendations can be adapted to the specific needs of countries, including Ukraine. The documents also highlight the role of international cooperation in ensuring quality education for all, which is particularly relevant in the context of challenges related to conflict or crises. Such documents increase attention to the social integration of children with special needs, contributing not only to their professional development but also to the overall enrichment of the educational environment. They offer effective mechanisms for monitoring and evaluating the implementation of inclusive practices, making them a versatile tool for education reforms.

Children with special needs have a variety of needs that can affect their learning process. One of the most

common types is visual impairment, which can range from a slight decrease in visual acuity to complete blindness. It is difficult for these children to navigate in space, read and write, therefore it is necessary to use special techniques and adapted teaching materials, such as Braille or tactile aids. Another type is hearing impairment, which can be of varying severity, from mild to advanced hearing loss. For these children, visual and gestural methods of communication are important, as well as special devices such as hearing aids. In the educational process, gestures, sign language or special programmes for speech development are often used. Autism spectrum disorders include a variety of developmental disorders characterised by difficulties in social interaction and communication, as well as repetitive behavioural patterns. Children with autism may have a limited understanding of other people's emotions and are excluded from group interactions. Structured classes, a clear sequence of actions and an individual approach are especially important for such children. Children with cerebral palsy face problems with motor activity and coordination. They may have difficulty walking, using their hands, and performing everyday tasks. These children require special physical therapy and adaptations to the educational process to ensure maximum independence. Attention deficit hyperactivity disorder is a disorder characterised by difficulty concentrating, impulsivity and hyperactivity. Children with attention deficit hyperactivity disorder may have trouble completing tasks, staying on task, and controlling their emotions and behaviour. They require individualised approaches to the organisation of the learning process, creating a structure that helps to maintain attention and encourages learning.

Children with special needs face numerous learning difficulties that depend on the nature of their characteristics. Children with visual impairments often face problems related to limited access to textual information. They have difficulty reading and writing due to small print or lack of appropriate devices. In addition, navigating the classroom space and interacting with peers can be a challenge as well. Special adaptations are needed for these children, such as materials with larger print, audiobooks or digital devices with voice-over functionality. An assistant can help navigate the classroom or complete assignments. Children with hearing impairments have difficulty understanding oral information, which makes it difficult to understand instructions, and explanations and communicate with teachers and classmates. They often face delays in learning to speak, which limits their ability to fully participate in the learning process. The use of visual cues, subtitles in videos, sign language or hearing aids can significantly improve their learning experience. Children with autism spectrum disorders often have difficulty socialising, communicating and adapting to new circumstances. Changes in routines or unexpected situations can cause them anxiety or confusion. They have difficulty working in groups and understanding verbal information. These children need a clear structure to the learning process, including

the use of visual timetables, support cards or individual programmes. Incentives and routines can help reduce their stress and improve learning performance. Children with cerebral palsy face physical limitations that affect their ability to complete tasks and interact with materials. For instance, they may find it difficult to write, use school equipment, or participate in sports or physical activities. Physical support, access to special equipment (e.g., touch-screen computers) and adapted materials should be provided for these children. Children with attention deficit hyperactivity disorder usually have difficulty concentrating, completing tasks and regulating their emotions. They can be impulsive, which prevents them from following

rules and working in a group. Teaching these children requires a clear lesson structure, short tasks, frequent breaks and positive reinforcement for good behaviour. Interactive teaching methods can improve their engagement in the process. Each type of special educational need is accompanied by specific difficulties that require an individualised approach and adaptation. The creation of conditions that consider these peculiarities contribute to the success of such children in learning and their harmonious development. Table 1 shows different types of adaptations for different educational needs, which help to create optimal conditions for the learning and development of children with special needs.

**Table 1.** Types of adaptations for different educational needs

Type of special educational needs	Examples of adaptations	Methods of education
Visual impairment	Use of enlarged print, embossed dot books (Braille), audio materials, digital devices with text-reading function	Use of tactile and audio aids, audiobooks, and accessible visual materials
Hearing impairment	Including subtitles in video materials, using sign language, fitting hearing aids, visual signals	Visualisation of educational material, use of graphs, diagrams, interactive whiteboards, inscriptions
Autism spectrum disorders	Clear lesson structure, reduction of stimuli, use of visual timetables, support cards	Develop individual training programmes, introduce a system of incentives, and use routine tasks.
Attention deficit disorder	Division of tasks into shorter stages, taking frequent breaks, using organisational tools (timers, planners)	Using interactive methods, involving children in activities that require movement
Cerebral palsy (childhood cerebral palsy)	Adapted written assignments (printed forms), special technical aids (e.g., touch-screen computers)	Individual support, use of additional time to complete tasks, physical support

**Source:** compiled by the author based on A. Wulschleger *et al.* (2020)

Albanian schools face a significant challenge in the integration of technology into the learning process, as the current state of technological resources in educational institutions is insufficient. This limitation underscores a gap that places Albania at a disadvantage compared to neighboring countries such as Greece and Italy, where technological advancements in education are more pronounced. The implementation of interactive learning methods could serve as a crucial step in bridging this gap and modernizing the Albanian education system.

### Comparative approaches to the adaptation of didactic methods in different countries

Adaptation of teaching methods is an important aspect of inclusive education, as accommodates different needs of students with special educational needs. One way to adapt is to change the form of tasks. For children with hearing impairments or communication disabilities, oral tasks can be replaced with written or interactive ones. For instance, instead of a traditional oral survey, interactive exercises can be used where the student engages with visual or audiovisual materials. This ensures that information is accessible to all children and tailored to their individual needs. Another way to adapt is to reduce the number of tasks or divide them into smaller stages. For children with special needs, such as attention deficit disorder or autism spectrum disorders, many tasks can be difficult to complete. Therefore, the task can be divided into several

smaller parts so that the student can gradually complete them and achieve success. This reduces overwhelm and helps to maintain interest in learning. For students with developmental delays, it is important to provide additional instruction. Teachers can give clearer and more detailed instructions for tasks, explaining each step of the process. This allows such children to better navigate the learning material and avoid misunderstandings. Visual cues are also particularly useful for children with hearing impairments. The use of pictures, diagrams, graphs, videos and even sign language can make the learning process much easier for these students. Visual cues help to better perceive and absorb information, compensating for the lack of auditory perception. These adaptation methods help to create an inclusive environment where every child can receive the support they need to succeed in school, regardless of their characteristics and needs.

The study conducted a comparative analysis of didactic methods adapted for inclusive education in different countries, including Greece, Italy and Albania. In Greece, the methodology “Employment of Technology for Inclusive Learning” was described, which aims to support children with special educational needs. It includes the use of adapted teaching materials that consider the peculiarities of the perception of students and special pedagogical technologies. These technologies provide access to educational content through interactive platforms, multimedia resources and integrated support systems. In Italy,

the Montessori Method, which is based on a multisensory approach to learning, was analysed (American Montessori Society, 2024). This approach involves the use of tactile, visual and auditory materials to develop the cognitive abilities of children, including students with special needs. The methodology aims to stimulate independence, develop creativity and build problem-solving skills in a favourable learning environment. Albania has studied the Differentiated Learning methodology, which is based on individualisation of the educational process. This methodology offers the adaptation of learning tasks, the use of lightweight texts and the involvement of visual materials to simplify the perception of educational content. As a result, each student can progress based on capabilities and needs. These methods are adapted to teaching children with special needs through individualisation of the learning process and the use of adapted tools that meet the specific requirements of students. In Greece, the “Use of Technology for Inclusive Education” methodology focuses on creating accessible materials that meet the needs of children with different types of disabilities. It involves the use of special training programs and devices that help children with disabilities perceive information. The use of adapted versions of textbooks and visual aids makes the material understandable and accessible to students with special needs, such as the visually impaired or those with learning disabilities. The Montessori Method in Italy adapts to the needs of children with special educational needs through a multi-sensory approach that uses tactile, auditory and visual materials to develop students. This approach allows students to better absorb knowledge through physical experience, which is extremely important for children with developmental disabilities or cognitive problems. This approach promotes independence and confidence in children, as they can interact with the learning material through different senses. An important aspect is the creation of a learning environment that allows children to choose activities according to their interests and abilities, which makes it possible to adapt learning to each student.

The Differentiated Learning methodology in Albania focuses on individualising approaches to each student, which is key for children with special needs. The use of facilitated texts, visual materials and adapted tasks reduces the complexity of the learning process and increases the level of learning. This is especially relevant for children who have difficulty reading or comprehending information, as well as for those with speech or hearing impairments. Using various methods and tools, such as visual aids or special curricula, children with special needs can successfully overcome learning difficulties, which contributes to their development and achievement of high results. The adaptation of curricula for children with special needs in Albania differs significantly from the approaches used in Greece and Italy, which highlights the advantages and disadvantages of each system. In Greece, inclusive education is based on the use of individual education plans. This approach is aimed at meeting the unique needs of each child, involving

teachers, specialists and parents in the creation and implementation of the plan. The advantage of this approach is its flexibility and focus on the individual student, but the disadvantage is the lack of resources, which makes it difficult to fully implement the programmes. At the same time, Greece has a well-developed system of professional training for teachers to work with children with special needs, which contributes to improving the quality of education.

In Italy, inclusion is deeply integrated into the general education system, where children with special needs attend regular schools. The Italian approach is characterised by cooperation between general and specialised teachers working in teams. This approach ensures equal access to education and promotes the socialisation of children. Italy also actively uses modern technologies to adapt educational materials. However, the main challenge remains overcoming the heavy workload of teachers and ensuring their ongoing professional development. In Albania, the approach to curriculum adaptation is still under development. Unlike Greece and Italy, Albania is more focused on creating separate classes for children with special needs. This approach limits the socialisation of children and their integration into the general educational process. The shortcomings of the Albanian system also include insufficient funding, weak material and technical facilities, and a lack of qualified professionals. At the same time, Albania is actively adopting the practices of neighbouring countries, including Greece and Italy, which opens prospects for improving the inclusive education system. Comparative analysis shows that Greece and Italy demonstrate the effectiveness of inclusive approaches through the integration of children into general education schools, which has not yet been achieved in Albania. At the same time, both countries face challenges related to providing sufficient resources and professional development for teachers. Albania can develop its system by drawing on the experience of its neighbours and adapting their successful practices to its conditions. Teachers in Albania lack adequate training in the use of interactive methodologies for working with children with special needs. This gap in professional development hinders the ability to provide inclusive and effective education, highlighting the need for targeted training programs to equip educators with the skills necessary to address the diverse needs of all students.

### **The importance of interactive platforms in teaching children with special needs**

The use of interactive platforms and facilitated texts in the teaching of children with special needs is an important step towards inclusive education in Albania. Interactive technologies, such as the use of online lesson software, adapted mobile applications and specialised curricula, have become important tools to facilitate the learning process of children with special needs. For instance, text integration tools that support voice prompts or adapted fonts can improve the comprehension of information for students with visual or hearing impairments. The use of adapted apps, such



as WordQ or Snap&Read, can reduce barriers to learning by providing the ability to view text in different formats, from voiceover to background colour changes, which can help students with dyslexia or other cognitive difficulties to better understand the material.

Additionally, mobile apps that specialise in teaching children with special needs, such as Ghotit Real Writer or Proloquo2Go, provide support for students with speech or cognitive disabilities. These apps use advanced technologies such as artificial intelligence to provide an adaptive approach to learning by offering interactive tasks and visual cues. Mobile apps can also be customised to facilitate learning for children with autism or developmental disabilities, as they offer the opportunity for interactive engagement where each stage of the learning process can be adapted to meet the needs of the learner. Additionally, online resources that include video and animated materials, such as Edpuzzle or Explain Everything, enable children with special needs to better comprehend complex concepts through visual explanations and interactive elements. The use of these technologies in education helps to maintain interest in lessons, makes learning more accessible and enables students to become more involved in the learning process, which has a positive impact on their progress and independence.

The use of facilitated texts in education is also essential as it facilitates access to material for children with reading disabilities such as dyslexia. The texts have a simple struc-

ture, reduced amount of information and adapted vocabulary, which makes them easier to understand. Studies in Albanian schools show that students who use facilitated texts perform better in reading comprehension tests and assignments. It helps reduce stress levels among children, as they do not feel overwhelmed by information and can focus on the main content. However, despite the significant benefits of interactive platforms and lightweight texts, there are also several challenges facing Albanian schools. One of the main problems is the lack of funding and limited access to modern technology in many educational institutions, especially in rural areas. This makes it difficult to introduce interactive platforms into the learning process. In addition, to use these technologies effectively, teachers need to be trained on how to adapt materials for children with special needs, which requires additional resources and time. Interactive platforms and facilitated texts are powerful tools for inclusive education, but to maximise their potential, access to technology and teacher training need to be addressed. Only under these conditions can sustainable results be achieved in improving the learning outcomes of children with special needs in Albania. The importance of such approaches is also growing in Albania, where inclusion in education is becoming an important step in the development of democratic and social processes in society. Table 2 presents strategies for inclusive classrooms that contribute to the successful integration and development of children with special educational needs.

**Table 2.** Strategies for inclusive classroom

Strategy	Description	Expected result
Individualisation of learning	Adaptation of materials, tasks and pace of learning to the needs and capabilities of a particular child	Increasing the level of learning, reducing stress for the child, improving academic performance
Use of multimedia	Use of interactive presentations, video, audio, and educational platforms and programmes	Increasing students' interest, stimulating activity in the learning process, improving understanding of the material
Differentiation of tasks	Development of tasks of different levels of difficulty, according to the abilities of each student	Reduction of anxiety, increasing motivation to learn, developing independence
Support for social interaction	Use of group tasks, organisation of work in pairs, distribution of roles in joint projects	Development of communication skills, building tolerance, establishing mutual understanding between students
Creation of a favourable environment	Reduction of noise, use of clear signals, adaptation of the physical space of the classroom	Reduction of irritants for children with environmental sensitivities, increasing comfort and safety in the learning space

**Source:** compiled by the author based on C. Tjernberg & K. Forsling (2023)

Successful adaptation of didactic methods and approaches to inclusive education of children with special needs has become an important component of modern education. Real cases of successful adaptation are considered, as well as an analysis of the successes and challenges that arise in this process. One of the most striking examples of successful adaptation can be seen in Albania, where programmes for children with hearing impairments have been implemented. Teachers were trained in the basics of sign language through teacher training programmes, which created an inclusive environment where children with hearing

impairments could learn together with their peers. In addition, the use of multimedia and interactive methods helped make the learning process accessible to children with other types of disabilities. Another example is the adaptation of teaching methods for children with autism. In such cases, teachers use specially designed programmes that include structured activities that help the child understand everyday situations and develop social skills. In Albania, as in many other countries, programmes are being created as part of inclusive education to adapt the environment and learning material to meet the needs of children with

autism. This includes the use of visual cues, and small groups to improve social interactions and learning through play.

The successes of such adaptations include increased social inclusion of students with special needs, improved academic performance and the development of communication skills. For instance, students with hearing impairments, using sign language and hearing aids, were able to significantly improve comprehension of the material and successfully integrate into classrooms by actively interacting with classmates. However, challenges remain. One of the main ones is the insufficient number of qualified professionals able to effectively engage with children with special needs, which limits the opportunities for large-scale implementation of inclusive programmes. The material base also needs to be improved – not all schools have the necessary resources to provide special teaching materials, such as interactive learning tools or specialised equipment. Thus, the successes in adapting teaching methods for children with special needs, particularly in countries such as Albania, demonstrate the importance of a comprehensive approach to education. However, it is also necessary to address the challenges that require additional efforts in terms of training and resources.

To improve the didactic tools and methods of inclusive education in Albania, it is important to integrate modern technologies into the learning process. One of these tools is adapted online platforms and software that can be used to customise learning content to meet the individual needs of students. These can include programmes for children with visual, hearing, or cognitive disabilities. In addition, teachers should also be able to use such platforms, which include regular training and refresher courses. Training should cover not only the theoretical foundations of inclusive pedagogy but also the practical application of adapted methods and technologies.

At the same time, it is necessary to develop a differentiated approach to teaching, which makes it possible to adapt materials and tasks to the individual capabilities of students. This includes the use of facilitated texts that allow children with special needs to better absorb the material. Simpler sentences, visuals, diagrams and drawings can make information much easier to understand. Using such tools helps create equal opportunities for all children, regardless of their abilities. Another important aspect is to create a supportive classroom environment that fosters the emotional development of students and helps each child feel comfortable and confident. It is important to provide access to learning materials in various forms, such as audio and video resources for children with hearing or visual impairments. Such resources allow every child to take an active part in the learning process. Implementation of these recommendations will create an inclusive educational environment in Albania that will promote the development of children with special needs and ensure equal access to quality education for all students.

Practical recommendations for educators and education authorities include the importance of promoting

inclusive education through teacher training and creating favourable conditions for children with special needs. Educators should be trained to use adapted methodologies and technologies, such as interactive platforms, facilitated texts and other differentiated resources. Education authorities should ensure adequate funding to provide specialised resources and equipment and actively contribute to the improvement of infrastructure for inclusive education. Successful implementation of inclusive education requires joint efforts by educators, governing bodies and parents to create a safe learning environment for all students. The topic of inclusive education is of particular importance in the modern world due to the growing awareness of the importance of equal access to quality education for all children, regardless of their special needs. This approach aims to ensure maximum integration of children with special needs into the general education environment, creating conditions for their personal and social growth. Research in this area covers a wide range of issues, from the adaptation of teaching methods to social and psychological support for students and their families.

Researchers such as K.-T. Lindner *et al.* (2022) emphasised the role of social interaction in creating an inclusive environment. These studies concur with the current research on the importance of social integration and creating an adaptive environment for children with special needs. The results of the study by M. Mithans *et al.* (2024) showed that the adaptation of teaching methods significantly improves children's engagement in the learning process. In particular, the authors identified that the use of individualised approaches contributes to more effective learning and increased self-esteem of students. They also emphasised that such approaches are especially relevant for children with different developmental needs, as taking their needs into account creates a comfortable and motivating learning environment. These authors often debate how to balance the social integration of students with the preservation of their individuality. The conclusions coincide with the results of the study in terms of adapting didactic methods for children with different developmental characteristics. The importance of this topic is also confirmed by various approaches to its study, including cultural aspects (Then & Pohlmann-Rother, 2024) and peer role analysis (Woodgate *et al.*, 2020). These discussions highlighted the need for a comprehensive approach to inclusion that considers pedagogical, psychological and social aspects. Their conclusions are consistent with the results of the study, which emphasise the importance of positive interactions between students to create an inclusive educational environment. Comparing the results of previous studies with this one, it is possible to identify commonalities, differences and further directions for the development of inclusive education. K.-T. Lindner *et al.* (2022), and M. Perlaza Rodríguez (2020) highlighted the factors that contribute to the social inclusion of students with special educational needs, including the interaction between parents, teachers and students themselves.

A different approach to the problem is proposed by M. Mithans *et al.* (2024), addressing the effectiveness of didactic strategies in primary school. Their findings show that flexibility of pedagogical methods contributes to better integration of students with special needs, which is consistent with the results of F. Rademaker *et al.* (2020), proving the importance of contact theory in increasing the social participation of these students in the school environment. S. Odom *et al.* (2021), and Z. Temiz & A. Parlak-Rakap (2023) presented a detailed historical analysis of educational interventions for children with autism, covering the last 40 years. The analysis revealed the evolution of approaches from traditional methods to modern programmes based on evidence-based practices such as Applied Behaviour Analysis. The authors noted that the gradual shift to more individualised and technologically supported approaches has significantly increased the effectiveness of teaching children with autism by adapting the process to their unique needs. In this context, the study by R. Woodgate *et al.* (2020) is relevant, as it examined the role of peers in promoting social inclusion. They demonstrated that peer interaction can be crucial to improving the effectiveness of inclusive programmes, as it contributes to a supportive environment. This confirms the findings of A. Paseka & S. Schwab (2020), emphasised the importance of social integration and cooperation between students to ensure the successful learning of children with special educational needs. In particular, the researchers noted that creating conditions for positive interaction not only improves academic performance but also promotes empathy and tolerance among all participants in the learning process.

J. Wåger & A. Bagger (2024), and D. Sklavaki (2022) summarised the didactic aspects of teaching children with intellectual disabilities, emphasising the importance of flexible approaches and involving students in joint activities. These findings correlate with the study by Y. Van den Berg & S. Stoltz (2018), who demonstrated that simple changes, such as classroom seating, can significantly improve social inclusion. The article correlates with the study in emphasising the importance of a comfortable environment and adaptive activities for the effective learning of children with special needs. In contrast, M.T. Rodriguez Sandoval *et al.* (2022) prioritised the development of critical thinking in children using specific didactic models. Their study addressed the development of students' skills in analysing, synthesising and evaluating information, which are important for the overall development of a child, but do not always account for aspects of social integration, which are key to inclusive education, while the study by D. Then & S. Pohlmann-Rother (2024) emphasised the adaptability of methods during the transition to inclusive education, stressing the importance of creating conditions that meet the individual needs of each student. Particular attention is paid to combining didactic methods with social interaction, which allows students with special needs to take an active part in joint activities. This approach contributes to the formation of a holistic inclusive

environment. This correlates with studies that emphasise the need for multi-stakeholder support, such as the UNESCO (2020) recommendations, which emphasise the importance of collaboration between all stakeholders in the educational process to achieve successful inclusion.

However, there are still aspects that need to be further explored to improve the effectiveness of inclusive education. One of these aspects is the long-term effectiveness of adapted methods. The question is whether these methods ensure sustainable progress in the learning and socialisation of students with special needs, especially after the initial stage of education. It is also necessary to study the impact of cultural differences on the implementation of inclusive strategies, as different countries and even regions may have specific approaches to education and perceptions of inclusion. In addition, mechanisms for assessing the social progress of students with special needs remain underdeveloped. The question is how to assess the level of integration, development of communication skills and acceptance of the role of active participants in the educational process by such students. This requires the development of new approaches to monitoring and analysis that would combine quantitative and qualitative assessment methods.

## CONCLUSIONS

An analysis of current practices in inclusive education for children with special needs in Albania demonstrates the importance of implementing adapted curricula, using interactive platforms and facilitated texts to help improve the effectiveness of the learning process. Inclusive methodologies require a comprehensive approach, including teacher training, development of technological resources and improvement of physical infrastructure to ensure access to learning for all students. International experience points to the need to further improve national education strategies, including strengthening social support networks and integrating new technologies into the educational process. The recommendations for educators and education authorities focus on improving the skills of teachers, providing access to adapted resources, and developing new methodologies based on international best practices.

The study also determined that the existence of international standards and guidelines, such as the UN Convention on the Rights of Persons with Disabilities and the UNESCO Principles for Inclusive Education, significantly improves the quality of inclusive education. However, not all countries have a sufficient level of implementation of these standards at the national level. A comparison of adaptation methods in Albania, Greece and Italy showed different levels of integration of children with special needs into mainstream schools. Italy, in particular, has demonstrated a high level of integration due to a clear regulatory framework and the use of modern technologies in education, while Albania and Greece face certain difficulties due to imperfect educational programmes and insufficient teacher training. In terms of methodological aspects, the use of

adapted tasks, individual approaches and special teaching technologies can achieve significant results. Children with special needs who are taught using such methods have shown better results than children who are educated using traditional methods. This confirms the need for further development and improvement of adaptive approaches to education. The results of the study confirmed the importance of introducing interactive platforms and adapted learning materials to improve the effectiveness of the learning process for children with special needs. Further research could

focus on studying a wider range of interactive technologies and their impact on the learning performance of children with different types of disabilities. A separate area for future research is the development of comprehensive teacher training programmes for inclusive classrooms.

None.

None.

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## CONFLICT OF INTEREST

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## Аїда Сотірі

Кандидат педагогічних наук, професор  
Університет імені Екрема Чабея в Гірокастері  
6002, вул. Студентська, 30, м. Гірокастра, Албанія  
<https://orcid.org/0009-0009-5404-0458>

### Адаптація дидактичних методів для дітей з особливими потребами в початковій школі

**Анотація.** Дослідження спрямоване на адаптацію дидактичних методів для дітей з особливими освітніми потребами в контексті інклюзивної освіти. Методологія включала аналіз документів, порівняння методів навчання, спостереження за взаємодією дітей з адаптованими матеріалами та статистичний аналіз даних. У дослідженні проаналізовано статистичні дані Міністерства освіти Албанії щодо кількості дітей з особливими потребами, рівня їхньої інтеграції в загальноосвітні школи та забезпечення шкіл адаптованими навчальними матеріалами. Аналіз освітніх стандартів і міжнародних рекомендацій, зокрема Конвенції ООН про права осіб з інвалідністю та принципів ЮНЕСКО, був використаний для оцінки ролі нормативних документів у розвитку інклюзивної освіти. Вісім критеріїв, що охоплюють цілі, структуру, відповідність міжнародним стандартам та інноваційність, були використані для оцінки документів, пов'язаних з адаптацією методик для дітей з особливими потребами. На основі цієї оцінки були визначені сильні та слабкі сторони кожного документа, які стали основою для розробки рекомендацій щодо вдосконалення інклюзивної освіти. Результати дослідження продемонстрували ефективність адаптованих дидактичних методів для дітей з особливими потребами в різних країнах. Методи, засновані на інклюзивних технологіях, мультисенсорному підході та диференційованому навчанні, забезпечують більш доступне сприйняття матеріалу та покращують процес навчання. Візуальні та тактильні матеріали, а також інтерактивні технології сприяють розвитку учнів з особливими потребами та підвищують їхню активність у навчальному процесі. Отримані результати також підтверджують необхідність подальшої адаптації освітніх програм для забезпечення рівних можливостей для всіх студентів. Практичне значення дослідження визначається вдосконаленням методів і засобів навчання дітей з особливими потребами

**Ключові слова:** розвиток учнів; адаптація навчання; методи навчання; соціалізація дітей; повноцінна освіта

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