МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ

«SCIENTIA ET SOCIETUS»

Збірник наукових праць

Випуск 2

Переяслав
2023

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE

«SCIENTIA ET SOCIETUS»

Collection of scientific works

Volume 2

Pereiaslav
2023

ISSN 2786-6319 (print)
ISSN 2786-6327 (online)

DOI: 10.69587/ss/2.2023

Засновник:
Університет Григорія Сковороди в Переяславі

Рекомендовано до друку та поширення
через мережу Інтернет Вченою радою
Університету Григорія Сковороди в Переяславі
(протокол № 12, від 12 грудня 2023 р.)

Свідоцтво про державну реєстрацію
друкованого засобу масової інформації
серії КВ № 25121-15061 ПР від 26.10.2022 р.

Науковий журнал включено до категорії «Б» Переліку наукових фахових видань України,
у яких можуть публікуватися результати дисертаційних робіт на здобуття наукових ступенів доктора
та кандидата наук зі спеціальностей: 011 – Освітні, педагогічні науки
(наказ МОН України від 20 лютого 2023 року №185).

Журнал представлено у міжнародних наукометричних базах даних,
репозитаріях та пошукових системах: Google Scholar, Research Bible, Citefactor,
Index Copernicus International, Національна бібліотека України імені В. І. Вернадського,

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ISSN 2786-6319 (print)
ISSN 2786-6327 (online)

DOI: 10.69587/ss/2.2023

Founder:
Hryhorii Skovoroda University in Pereiaslav

Recommended for printing and distribution
via the Internet by the Academic Council
of Hryhorii Skovoroda University in Pereiaslav
(Minutes No. 12 of December 12, 2023)

Certificate of state registration
of the print media
Series KB No. 25121-15061 PR dated 26.10.2022

The scientific journal is included in category «B» of the List of scientific specialized publications of Ukraine, in which can be published the results of dissertations for obtaining the scientific degrees of doctor and candidate of sciences in specialties: » 011 – educational, pedagogical sciences
(order of the Ministry of Education and Science of Ukraine No. 185, dated February 20, 2023)

The journal is presented international scientometric databases, repositories and scientific systems: Google Scholar, Research Bible, Citefactor,
Index Copernicus International, Vernadsky National Library of Ukraine

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РЕДАКЦІЙНА КОЛЕГІЯ

EDITORIAL BOARD

ЗМІСТ/ CONTENTS

Vol. 2. No. 2. 2023 Scientia et societus
Received: 11.08.2023.
Revised: 15.11.2023.
Accepted: 12.12.2023.
Journal homepage: https://ses.journal.in.ua/index.php/ses/issue/view/4

UDC 159.944.4:091.2:[613.955:355.48](470:477) *DOI: 10.69587/ss/2.2023.08*

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Assessing the impact of stress factors of the educational process on psychosomatic health of schoolchildren in the conditions of the Russo-Ukrainian war

Abstract. In the conditions of the current full-scale Russo-Ukrainian war, there is an increase in cases of depression, apathy, anxiety and different disorders, as well as other psychological problems that affect the academic process and psychosomatic health of schoolchildren in Ukraine, which makes this problem an important topic for study. The purpose of the research was to characterize the kinds of stress factors in the educational environment and their possible effects on schoolchildren's bodies both in peacetime and wartime conditions; and to assess the real impact of school stress on the psychosomatic health of schoolchildren by taking an experimental approach. The theoretical method made it possible to analyze, synthesize, systematize and summarize the information on stress factors of the educational process affecting schoolchildren which is available in academic literature. The experimental research involved schoolchildren attending gymnasiums (high schools) in Pereiaslav, Kyiv Region. An anonymous questionnaire survey for parents was used to determine the presence of anxiety, its causes and consequences for the schoolchildren under examination. The surveyed gymnasium students were tested to determine academic stress, self-assessment of stress resistance and resilience. It has been established that the academic environment of Ukrainian educational institutions in the wartime conditions is characterized by the emergence of numerous stress factors. The high school students under examination had a high level of anxiety, a low level of stress resistance and an average level of resilience. The obtained results of the test to determine academic stress have demonstrated that the educational process had a negative impact on the health and academic performance of schoolchildren. The increase in stress factors during the large-scale Russo-Ukrainian war had a negative impact on the psychosomatic health, academic performance and social adaptation of schoolchildren to learning. Results of this research can be used for development and implementation of psychoprophylactic measures meant to reduce stress conditions in schoolchildren both in the school environment and at home, therefore promoting a favorable psychological environment and well-being

Keywords: stress; schoolchildren; stress resistance; resilience; anxiety; academic performance

Suggested Citation:
Kotsur, N., & Tovkun, L. (2023). Assessing the impact of stress factors of the educational process on psychosomatic health of schoolchildren in the conditions of the Russo-Ukrainian war. *Scientia et societus*, 2(2), 8-21. doi: 10.69587/ss/2.2023.08.

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INTRODUCTION

As a result of the full-scale Russian invasion to Ukraine on 24 February 2022, Ukraine's secondary education has suffered heavy human and material losses. During combat activities and Russian occupation, many people have perished including educators, schoolchildren, their parents and relatives. Many secondary education institutions have been destroyed, damaged or plundered. Because of the war, millions of students and educators had to relocate: some locally in Ukraine and others abroad (Kohut *et al.*, 2023). Therefore, the increase in stress factors of the modern educational process in the wartime conditions and their negative impact on schoolchildren's psychosomatic health make this problem especially relevant. Overcoming the dreadful challenges of war, all participants of the educational process continued studies in distance or mixed form, with forced interruptions caused by air raid alarms or power cuts. The abovesaid learning conditions have had a negative influence on the quality of the educational process and schoolchildren's performance, and affected their psychological and emotional state in an especially severe way. Meanwhile, despite the abovementioned circumstances, teachers performed their professional duties, motivating schoolchildren to achieve a high level of knowledge and skills, conducting tests in accordance with the curriculum, and providing a proper amount of homework. As a consequence, most present-day schoolchildren have to face stress conditions and feel their negative consequences. Depression, anxiety and various psychological issues are becoming more and more widespread, which affects schoolchildren's studies and overall state of health. Being aware of stress in the educational process also has a negative influence on their academic performance. In addition, stress interferes with concentration, memory and development of creative skills which subsequently impairs academic results.

Before 24 February 2022, Ukrainian scientists mostly studied the stress factors that emerged in the educational process during peacetime conditions. In the conditions of the Russo-Ukrainian war, it is worth studying the new stress factors affecting schoolchildren that are related to war, combat operations, and occupation as well as the ways and methods of eliminating consequences of stress caused by such factors; new research works have emerged that focus on current problems in organizing and ensuring security of educational environments in Ukraine. In particular, organization of the educational process in conditions of martial law is covered by materials of the all-Ukrainian scientific and pedagogical vocational training (Kohut *et al.*, 2023). Such scholars as N.I. Kotsur & L.P. Tovkun (2023) studied formation of psychological safety of the educational environment in the conditions of the Russo-Ukrainian war. The authors note that the number of threats and dangers seriously affecting schoolchildren's and students' psychosomatic health has increased during the Russo-Ukrainian war. Effects of the Russo-Ukrainian war on the nation's mental health are revealed in the research by N.I. Kotsur (2022). Psychological peculiarities in manifestation of stress and resilience in schoolchildren are also covered in the article by O.M. Basenko (2019). According to T.M. Titarenko & T.O. Larina (n.d.), a person's resilience is currently considered a social necessity and an element of safety. Such scientists as G.M. Danylenko *et al*. (2023) emphasize that doctors and psychologists should monitor the health conditions of internally displaced schoolchildren for effects of the current war in Ukraine. Meanwhile, A. Mina *et al*. (2023) note that armed conflicts cause problems with nutrition and housing, which affects schoolchildren's emotions and behavior, provoking an increase in the spread of mental illnesses among children. As a consequence, this will have a negative effect on their adaptation and functioning in adult life. In their work, A. Kadir *et al*. (2018) remarked that armed conflicts severely damage children of various ages as they affect their physical, mental, and behavioral health throughout all of their lives. Taking into account the colossal scale of current armed conflicts in the world, it is important that children's health care specialists should understand those consequences and react to them in a timely manner not only in specific countries affected by conflicts, but in worldwide terms as well. G.J. Jucier *et al*. (2022) emphasize that continued war in Ukraine threatens lives and well-being of millions of children as they are subjected to permanent artillery bombardments and risk of injuries. It will have grave long-term consequences for their mental health and is certainly a threat for their future. M. Mohseni *et al*. (2020) also hold to the opinion that armed conflicts or wars have never had any positive effect on children's health.

Stress factors (academic, social and emotional pressure, family problems and physical stress) all have a negative impact on schoolchildren's health, academic performance, and social adaptation. In this connection, more attention should be paid to psychological well-being of schoolchildren, and if necessary, special measures have to be developed and implemented to reduce the influence of such stress factors both in domestic environment and in educational institutions. That being said, the purpose of the research was to characterize the kinds of stress factors in the educational environment and their possible effects on schoolchildren's bodies both in peacetime and wartime conditions; and to assess the real impact of school stress on the psychosomatic health of schoolchildren by taking an experimental approach. The task of the research is to analyze the various kinds of stress factors of the educational process for schoolchildren under present conditions; and to determine, by an experimental approach, the real situation with effects of school stress on somatic and mental health of schoolchildren as exemplified by ninth form students of high schools in Pereiaslav, Kyiv Region. The novelty of the research is that within the framework of the said problem, it is the first time that the effects of war-related stress factors of the educational process on schoolchildren's somatic and psychological condition have been assessed. At a later stage, it will allow us to develop

effective strategies to support schoolchildren's psychosomatic health in the complicated wartime environment.

LITERATURE REVIEW

Teaching schoolchildren at institutions of comprehensive secondary education in the conditions of the Russo-Ukrainian war has a negative influence on their physical and mental health. It is closely connected with the effects of such negative stress factors as psychological stress, oversaturation with information, bullying, regular ailments, increased anxiety due to air raid alerts, combat operations, and life in occupied territories of Ukraine. In a modern dictionary compiled by I.I. Prykhodko (2021) the term "stress" is defined as well as its kinds (combat, psychological, traumatic, physiological stress) and descriptions of stress behavior, types of stressors, and stress resistance are provided. Stress factors are any factors whose power of influence exceeds adaptive reactions of a body or system, but too much so as to cause lethal outcomes. The influence of such factors is facilitated by extreme living, learning or work conditions. Stress factors during distance learning in conditions of COVID-19 pandemics were analyzed in the article by H. Stelmashchuk (2021). During the recent years, the number of researches focusing on the interrelation between stress and schoolchildren's emotional well-being has increased in the scientific field. For example, M.E. Rodríguez-Rivas *et al.* (2023) analyzed the correlation between a stress condition and life satisfaction in teenage Chilean students during the period of distance learning. They have also established that the feeling of stress has a negative influence on life satisfaction. J. Guzmán *et al*. (2020) noted that schoolchildren's overall life satisfaction largely affects the relation between mental health risks and perception of academic and social functioning. Scientific research also indicates the importance of the role played by educational community in how teenage schoolchildren perceive the level of stress. In particular, A.W. Van Loon *et al*. (2020) emphasized that the school environment during classroom learning accompanied by various extracurricular and sporting events have a positive effect in reducing stress levels and ensure that schoolchildren have a higher level of well-being. C. Esposito *et al*. (2021) discovered that in the circumstances when usual personal communication was impossible, online communication filled the gap between peers and this considerably reduced the feeling of isolation and decreased manifestations of psychological stress. Support on the part of the educational institution, the teaching staff and classmates plays an important role in this process. In their research, M.D. Lyons & X. Jiang (2022) concluded that support from teachers and classmates has a positive influence on the quality of life and reduces the negative impact of stress on schoolchildren. G. Milas *et al*. (2021) suggested that in order to improve students' mental health, special preventive and educational programs should be applied to reduce stress levels.

The negative stress factors that influence schoolchildren's health considerably include bullying. The problem of bullying has been concealed for a long time. The Constitution of Ukraine declares that the main rights of a person and citizen are the inalienable right to life, freedom and inviolability, respect of their honor and dignity (Constitution of Ukraine – Section II., n.d.). In this connection, a series of publications dedicated to this problem have appeared in the scientific environment. In particular, the bibliographical reference by N.L. Karpinska (2019) for head teachers, form teachers, subject teachers and teenagers reveals the essence of bullying and its types, causes and consequences. Also, this reference provides comprehensive information regarding policy of the state in protecting children and their rights. Considering pedagogical violence, scientists E. Matusov & P. Sullivan (2020) remarked that there are various forms of psychological and social violence that affect students' health, provoke physical, social and psychological pathologies, such forms being either a means of teaching or deliberate side effect of teaching that are used on a regular basis. It can be manifested as violent reactions from both students and teachers, and it can be directed against other learners or members of the teaching staff. In his article, R. Volosheniuk (2019) concludes that cyberbullying is a dangerous form of virtual aggression. In the study of bullying and teenage mental health, R. Ringdal *et al*. (2021) discovered that bullying is combined with decreasing levels of mental well-being and increasing symptoms of anxiety and depression. In exploration of bullying in a school environment, J.M. Aldridge *et al*. (2020) provided recommendations for school teachers on improving schoolchildren's mental health by ensuring their work in a favorable psychological and social school environment.

MATERIALS AND METHODS

The research has been performed within the framework of the scientific topics of the Chair of Health and Life Safety at Hryhorii Skovoroda University in Pereiaslav, "Formation of health preservation competence in children, schoolchildren and university youth in the system of lifelong continuous education: medical-biological and psychological-pedagogical aspects". In the course of the research, the following theoretical methods were applied: analysis, synthesis, systematization, and generalization. With the use of these methods, the information available in scientific sources on stress factors of the educational process for schoolchildren was processed. The research was conducted in the period from December 2022 to February 2023 and involved 9th form students from gymnasiums (high schools) No.1 – No.5 located in Pereiaslav, Kyiv Region. School administrators agreed to participate in this research since they saw certain practical importance in it. Schoolchildren's parents also agreed on the students' participation in the research and the questionnaire survey for manifestations of stress. Therefore, the research was conducted with participation of gymnasium students, in the presence of gymnasium psychologists and with observance of the Helsinki Declaration (The Declaration of Helsinki, 2013). In order to identify presence of anxie-

ty, its causes and consequences for the studied schoolchildren,an anonymous questionnaire survey for their parents was organized as well. The questionnaire contained eight questions, where participants had to underline one answer:

1) Does your child often worry? *(Yes/No)*;

2) Does your child often find it difficult to concentrate on doing their homework? *(Yes/No)*;

3) Is your child often afraid of staying home alone? *(Yes/No)*;

4) Does your child often find it difficult to calm down? *(Yes/No)*;

5) Does your child have sleeping problems? *(Yes/No)*;

6) Does your child have problems in communication with their peers? *(Yes/No)*;

7) Does your child have problems in communication with their teachers? *(Yes/No)*;

8) How often did you notice the following states in your child's mood over the last month: apathy, loneliness, sadness, anxiety, anger (*never; sometimes; 1-2 times; often or all the time*).

With the consent of gymnasiums' administrators, psychological testing was conducted among the studied schoolchildren. In particular, with the help of the Test for Determining Educational Stress by Yi. Shcherbatykh (n.d.) the main causes of stress and its manifestations in conditions of the educational process along with main techniques to cope with stress were identified. The studied schoolchildren answered four sets of questions seeking to reveal intellectual stress symptoms, behavioral stress symptoms, emotional symptoms, and physiological symptoms. Test results were assessed by the number of points scored: 0-5 points – stress is absent; 6-12 points – moderate stress; 13-24 points – quite prominent stress of emotional and physiological systems; 25-40 points – heavy stress; over 40 points – dangerous stress level – adaptation energy is exhausted. The obtained test results helped to identify special needs of the studied schoolchildren as regards psychological support, methodological means or other resources that facilitate stress reduction and improvement of the educational process (The Test for Determining..., n.d.). In order to identify the level of stress resistance and ability to counter the effects of stress factors, as well as to adapt to negative life circumstances, the test of stress resistance (The test of self-assessment..., n.d.). was used. The test consisted of 10 questions, and schoolchildren were suggested to underline one of the possible answers so as to assess their own reactions to stress situations. The final result was calculated by adding all points that the studied schoolchildren scored by answering the questions. Such self-assessment of their stress resistance helped the schoolchildren to get a better idea of their response to stress and overall stress resistance. The use of this test provided exhaustive information to develop strategies to handle stress and improve general well-being (The test of self-assessment..., n.d.). The test of resilience enabled the authors to characterize a person's ability to withstand a stress situation while maintaining inner composure and preserving the current level of performance in typical activities. The studied schoolchildren were asked to respond to 45 statements by choosing one of the suggested answers. The resilience index was interpreted on the basis of the total amount of points scored by a participant (The test of resilience by S. Muddy (adapted by D.A. Leontiev and Ye. I. Raskazov), n.d.). The obtained empirical data was grouped and represented in diagrams and charts.

RESULTS

Analyzing the classification of stress factors for modern schoolchildren in the educational environment should begin with such ***factor as the war in Ukraine***. War will always be the destabilizing factor that always affects all people, especially schoolchildren, since education is the main aspect in a child's development. However, in conditions of the war, education faces numerous challenges that provoke emergence of stress factors for schoolchildren in the course of their studies: psychological pressure, physical danger, separation from their parents, lack of resources, social instability, and need for psychologic support. The stress factors affecting schoolchildren in combat areas or in occupied territories are many-valued and have a negative influence on both their psychological condition and academic performance. These include political instability, physical danger, social isolation, inaccessibility of education, and psychological stress. The stress factors for schoolchildren in captivity are a very threatening and stress-generating factor. It may occur when children are kidnapped, taken hostage, or are controlled by unknown (armed) persons against their will. As a result of possible physical and psychological torture in captivity, schoolchildren may develop long-term negative consequences for their mental and somatic health. Experience of being held in captivity may lead to separation of family members, and this can aggravate the feelings of fear, anxiety and helplessness, and cause emotional stress in schoolchildren. Usually, prisoners are deprived of access to basic needs (regular meals, pure drinking water, timely medical aid, proper education) which has an extremely negative impact on their mental and somatic health. Captive schoolchildren survive traumatic experiences consciously (bombardments, searches, pursuits, maltreatment etc) and it inadvertently affects their psychology. Permanent stress and instability cause psychological pressure on schoolchildren resulting in anxiety, depression and psychotraumas. Being in Russian captivity is an outrageous violation of Ukrainian children's rights: the rights to safety, education, and protection against violence and exploitation (Tovkun & Porhun, 2023).

The stress factors for schoolchildren attending schools in occupied territories include as follows: 1) lack of normal conditions for studying, as occupation causes a decrease in the quality of educational services. Due to limited opportunities and resources, schoolchildren develop anxiety and stress; 2) occupation always leads to *political pressure and indoctrination* (enforcement of a certain ideology and distortion of historical facts). Such actions affect

independence of thinking and psychological conditions of the underage; 3) occupation is the reason for *restricted access to any opportunities for development* (sports clubs, artistic and music activities, excursions), and all that has a negative impact on psychological health and social well-being of schoolchildren; 4) permanent *fear* of possible violence or conflict during the educational process leads to constant *anxiety* and post-traumatic stress disorder of students; 5) *social isolation* through occupation of schoolchildren arises feelings of loneliness and estrangement, for absence of connections with friends and relatives; 6) because of political pressure in occupation, *incorrect or modified information and teaching* are spreading, which change the children's worldview and exert a negative influence on their development; 7) conditions of occupation result in an increasing *risk of injury and violence* among schoolchildren (physical, emotional, verbal violence), which has a deteriorating impact on both their psychological condition and academic achievements; 8) occupation inevitably leads to *economic difficulties* for civil population (instability, reduced income, unemployment), which affects directly children's living conditions and health (Tovkun & Porhun, 2023).

Schoolchildren who survived combat operations, occupation, captivity or witnessed consequences of these atrocities may develop a post-traumatic stress disorder (nightmares, anxiety, permanent tension, reliving events of the past). As a result, they develop emotional problems (depression, anxiety, stress) that have a direct influence on their motivation to study, academic performance and health. This is why educational institutions have to provide schoolchildren with free access to psychologists or psychological services, psychologic support programs to help schoolchildren overcome stress and restore their psychological resilience (Where and how Ukrainian children..., 2022). At the same time, it is worth considering the stress factors of the educational process that emerge in normal peacetime conditions and still have a negative effect on schoolchildren's health.

Academic factors. Excessive amount of homework, various projects, tests and other academic requirements cause schoolchildren to become overloaded, which results in lack of time, poor homework preparation, and disruption of the day regimen. Exaggerated standards and expectations on the part of educators and parents exert nervous tension on schoolchildren; due to constant pressure for success, schoolchildren develop anxiety and stress. High requirements for compliance with deadlines and quality standards in performance of various research works create a permanently stressed environment for schoolchildren. Assessment and rating activities are another source of stress for students. Due to the fear of getting a bad mark, their self-esteem decreases, and a permanent state of anxiety develops. The competitive environment of an educational institution is always a source of stress, tension and anxiety (competing for higher marks, better positions, fear of falling behind or failing to live up to somebody's expectations). Regular tests and exams make schoolchildren feel fear and anxiety because of possible poor results. An unfavorable academic environment – lack of support from teachers and classmates, poor learning conditions and inaccessibility of resources tend to increase the level of stress considerably (Ivantsanich, n.d.). Therefore, the abovementioned factors lead to overexerting mental resources, anxiety and development of continued stress conditions in schoolchildren. Due to an immense amount of academic work, schoolchildren have less and less time for recreation, entertainment and socializing, and this is going to affect their overall well-being and health at a later stage.

Social factors. Interpersonal relations (communication with peers and teachers) can also be a source of stress, since there are certain issues in establishing social connections and the feeling of being rejected by collective, which has a negative impact on schoolchildren's self-esteem and emotional state. Conflict situations involving peers or teachers (bullying, jealousy, competition, difference of opinions) provoke emergence of anxiety and stress in schoolchildren. The intensive pace of the educational process, steep demands, fear, failures caused by complicated / misunderstood teaching materials also cause stress conditions. A new social environment (admission to the first form, transition to the fifth or tenth form, or to another educational institution, any changes to the social surroundings) poses a complicated psychological challenge for schoolchildren, since they have to adapt to new conditions, collectives and relations. Family problems (parents' divorce, conflicts, financial difficulties, unemployment) have a negative impact on both the quality of life and mental health, thus triggering stress conditions. Being responsible for completion of assignments (projects, participation in activities, public speeches) is a powerful stress for most schoolchildren (Ivantsanich, n.d.). For students, their popularity among peers and compliance with the social standards ruling their environment is of utmost importance, and this is one of the factors to cause stress. Forms of social pressure include compliance with requirements to appearance, behavior, and academic performance. If schoolchildren feel they fail to comply with the standards as expected, this results in emergence of stress conditions. Such students develop low self-esteem, dissatisfaction with themselves, and their well-being deteriorates. In addition, everyday parental supervision of academic progress also facilitates development of anxiety. For this reason, schoolchildren develop the fear of failure to satisfy their parents' or teachers' expectations. It is this factor that boosts their stress and threatens their psychological well-being. Social factors also include family issues (parents' divorce, family conflicts, family violence, financial difficulties). Such atmosphere at home has a negative impact on schoolchildren's emotional state and causes a stress condition. Consequences typically include deteriorated behavior and academic performance. Financial crises in the family cause instability, dismay, worries and quarrels between parents. Children are usually very sensitive to such situations, since they feel it on their own (restrictions in satisfying new needs, receiving education, purchasing things, or food). Because of that, schoolchildren develop a negative

emotional state and lose their motivation to study. All these factors combined affect their memory, concentration, and ability to absorb new information.

Ecological factors. Physical environment (incompliance with sanitary standards for classrooms or laboratories) can create a feeling of discomfort and cause negative consequences for schoolchildren's health. Loud noise in classrooms of educational institutions or in the playgrounds distracts schoolchildren's attention, reduces the period required for the fatigue to accumulate, and poses a serious hindrance to studies, while permanent noise causes annoyance and stress. Poor quality of air in classrooms of educational institutions (high level of CO_2, allergic agents) affects proper functioning of the brain and respiratory system. Poor quality potable water and food at educational institutions cause discomfort and health problems. Dangerous routes from home to school and back, dangerous pedestrian crossings or their absence also provoke anxiety and stress in schoolchildren. Ecological disasters (all kinds of air or water pollution, natural disasters) exert a negative influence on schoolchildren's somatic and mental health.

Psychological factors. Low self-esteem and insecurity provoke development of stress. Children should be taught to set adequate standards for themselves to prevent them from worrying and regretting failures. High self-esteem is also a problem, since basing one's judgment on inadequate and excessive expectations also leads to stress, as the schoolchild fails to live up to their own standards. Perfectionism (inability to accept minor failures) provokes discontent and permanent stress. Fear of failure during studies can create permanent anxiety and stress conditions in schoolchildren. Adaptation to changes (fixed classroom-based system of learning, new teachers) also creates stress, especially in schoolchildren who are less communicative and find it more difficult to adapt to new conditions. Social ties (feeling of aloofness, problems in establishing social connections, conflicts with peers) excite feelings of isolation and permanent stress. Pressure from parents and teachers (excessive control, expecting excellent results) instill stress and anxiety in children's hearts. Emotional pressure is a schoolchild's collision with emotional problems: low self-esteem, problems with acquiring a proper status among peers, anxiety, and depressed mood. All of these have a negative impact on schoolchildren's psychological health and their academic achievements. In particular, students with low self-esteem always doubt their abilities and fail to believe in success of any activity they may undertake. Schoolchildren suffering from bullying or social oppression tend to feel stress and anxiety within an educational institution. Such states affect their adaptation, education and academic achievements. Students subjected to permanent anxiety suffer from poor concentration, have problems with memorizing things and handling various tasks. Due to constant nervous tension, schoolchildren lose the opportunity to study well. Students who are in a state of depression have no interest in studies. Instead, they feel tired and exhausted all the time. Such conditions provoke academic motivation to disappear, which results in negative academic performance indicators.

Physical stress includes inadequate sleep during the day as compared to corresponding age-related standards, lack of physical activity, and availability of chronic diseases. All these factors have a negative influence on the energetic condition of schoolchildren, as well as on their concentration and health. For example, inadequate amount of daily sleep, improper nutrition and low motion activity cause development of fatigue and loss of energy. In its turn, this affects schoolchildren's concentration, their ability to listen carefully and quickly absorb new information. Irrational lifestyle and chronic diseases contribute to deterioration of schoolchildren's health. With all that, a schoolchild tends to lose their mood, and any willingness to participate in the life of the local educational community. A stress reaction caused by physical stress has a negative influence on their emotional state and ability to manage their own emotions. All these factors combined lead to reduced self-control, deteriorating mood, and increased anxiety levels. Based on a theoretical analysis of modern stress factors of the educational process and their effects on somatic and mental health of schoolchildren, an empirical research was conducted.

Since gymnasiums of Pereiaslav practiced distance learning throughout 2022-2023, only parents could provide exhaustive information regarding presence of anxiety symptoms in their children attending the gymnasiums. According to the **questionnaire survey**, most parents (68%) believed that their children had stress symptoms: often worried (48.2%), found it difficult to concentrate on doing their homework (39.4%), were afraid to stay home alone (27.3%), found it difficult to calm down (23.7%), had sleep problems (22.6%), has communication problems with peers (16.8%) and teachers (15.9%). From parents' evidence, we have established that the studied schoolchildren most often experienced anxiety and sadness, and least of all – apathy (Fig. 1).

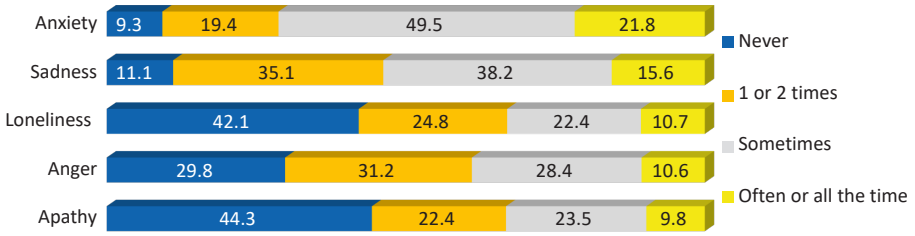

Figure 1. How often did you notice these states in your child's mood over the last month? %
Source: developed by the authors

Academic stress is determined with the Test for Determining Academic Stress by Y.V. Shcherbatykh (n.d.) At first, average values for causes academic stress in the studied schoolchildren were found (Fig. 2).

Changes in the permanent stress level during December 2022, January and February 2023 are shown in Fig. 3.

Results of studies-related stress manifestation in studied schoolchildren are presented in Fig. 4.

To eliminate stress symptoms, the studied schoolchildren most frequently used such methods as communication with friends or a loved one, breaks from study, and sleep (Fig. 5).

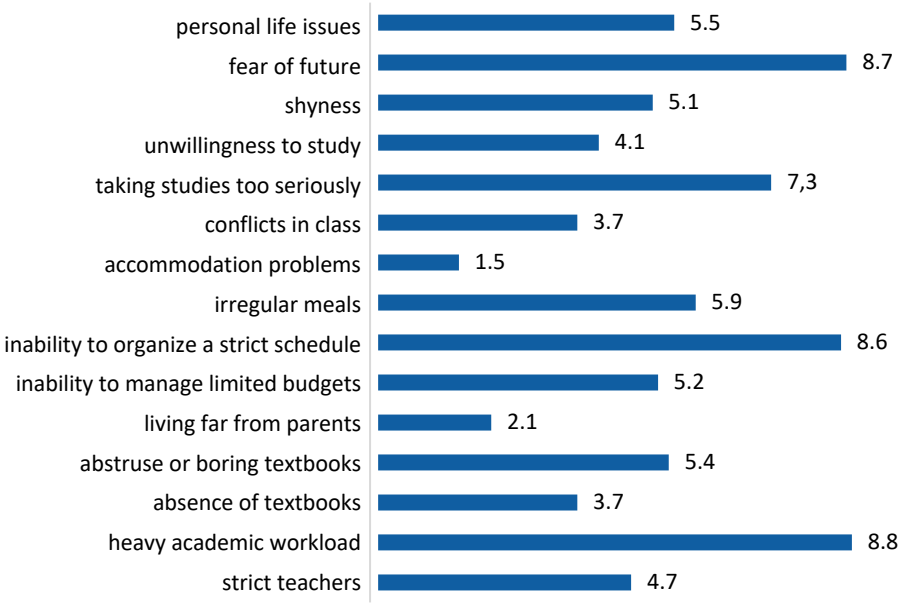

Figure 2. Causes of academic stress (average), %
Source: developed by the authors on the basis of the Test for Determining Academic Stress by Y.V. Shcherbatykh (n.d.)

Figure 3. Changes in permanent stress level, December 2022, January and February 2023, %
Source: developed by the authors on the basis of the Test for Determining Academic Stress by Y.V. Shcherbatykh (n.d.)

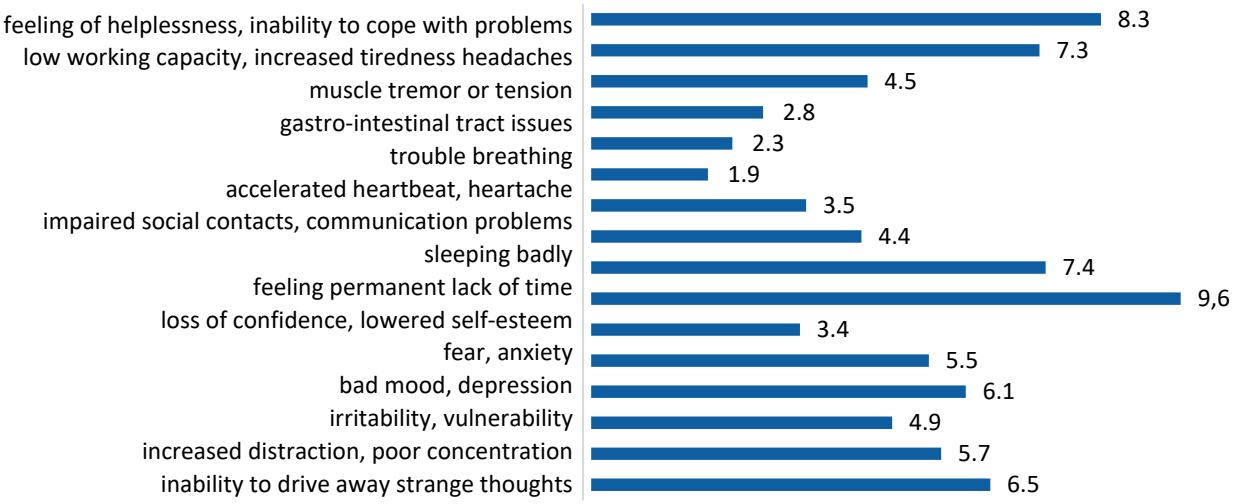

Figure 4. Stress manifestation in studied schoolchildren (average), %
Source: developed by the authors on the basis of the Test for Determining Academic Stress by Y.V. Shcherbatykh (n.d.)

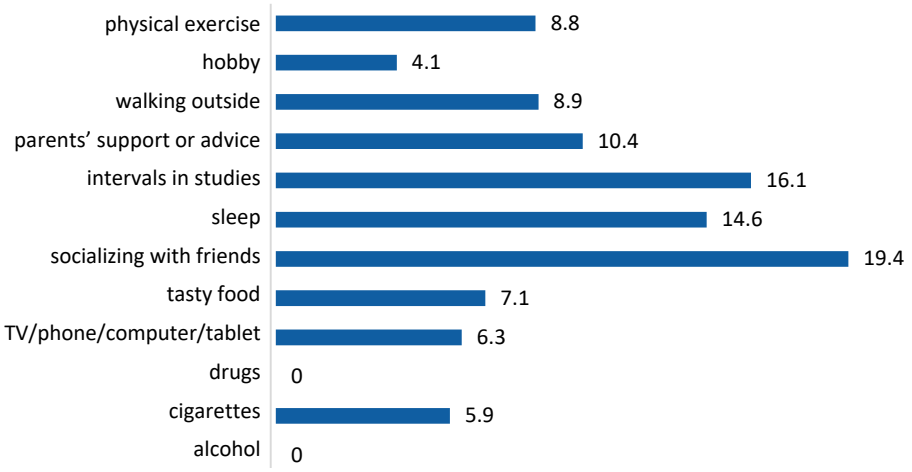

Figure 5. Methods used to eliminate stress symptoms, %

Source: developed by the authors on the basis of the Test for Determining Academic Stress by Y.V. Shcherbatykh (n.d.)

The level of anxiety in studied schoolchildren before tests is represented in points as follows: 1 point – 5.7%, 2 points – 5.3%, 3 points – 12.4%, 4 points – 2.8%, 5 points – 8.5%, 6 points – 14.2%, 7 points – 20.1%, 8 points – 12.6%, 9 points – 10.2%, 10 points – 8.2%. The studied schoolchildren indicated having such stress symptoms before tests: accelerated heartbeat – 39.2%, dry mouth – 16.4%, trouble breathing – 22.5%, headaches or other kinds of pain – 13.8%, muscle tremor or tension – 8.1%.

Determining stress resistance and resilience in senior schoolchildren.

As can be observed from results of the previous research to identify academic stress, educational process is exhausting for schoolchildren and is accompanied by a variety of stress conditions. That is why explorations of stress resistance and resilience of senior gymnasium schoolchildren in the circumstances of the war in Ukraine can help to improve support programs for overcoming stress, and enhance their abilities in securing success and overall psychological and physical well-being. Results of such explorations will help institutions of general secondary education to understand the effects of war on schoolchildren's health better and develop effective measures to strengthen children's health and prevent psychosomatic disorders. Results obtained in application of S. Cowan and G. Willianson's self-assessment test of stress resistance enabled us to identify levels of stress resistance in the studied schoolchildren, how effectively they can cope with stress, and how well they can adapt to negative happenings in their lives. In particular, an excellent level of stress resistance is only found in 4.8% of the studied group, a good level – in 24.7%, a satisfactory level – in 28.8%, a poor level – in 33.2% and a very low level – in 8.5% of the participants.

S. Muddy's test of resilience (adapted by D.A. Leontiev and E.I. Raskazov) identified the ability of the studied schoolchildren to withstand a stress situation while maintaining inner composure and preserving the current level of performance in typical activities. For instance, a high level of resilience is found in 22.1%, a medium level – in 57.9% and a low level – in 20.0% of the studied group. Results of the studied children correspond to average and above average values of the resilience test, which indicates the distinctness of the measured factors. The data is presented in Table 1:

Table 1. Average figures for studied schoolchildren in the Test of Resilience, %

Involvement	Control	Risk acceptance	Resilience
35.2	29.4	17.8	84.4

Source: developed by the authors

Hence, according to the analysis of the classification of stress factors for schoolchildren in the educational environment, we have established that in wartime conditions, the educational process has to be adapted for the needs of schoolchildren who experienced, or are currently experiencing combat operations (by modifying curriculum, establishing a flexible class schedule, introducing distance or mixed learning pattern with safe conditions ensured). Stress factors related to being in a combat area, captivity or occupation suggest the need to apply required immediate action to ensure schoolchildren's safety, soonest release and rehabilitation. Schoolchildren who experienced captivity or occupation require individual long-term psychological support, reintegration into the society, correction of the traumatic experience, and restoration of their mental health. The main step to eliminate the abovesaid stress factors is complete termination of war in Ukraine, immediate individual psychological support and social adaptation, along with provision of a safe educational environment for all schoolchildren. Reaction to academic stress is individual for every child: some of them cope faster with it, while others feel emotional discomfort for

a long time. In this relation, the following psychohygienic actions should be taken to reduce the effects of academic stress on schoolchildren: 1) develop and adhere to a rational day regimen and biorhythm-based principles of organizing the educational process; 2) ensure mutual support between classmates; 3) enable schoolchildren to cope with stress, use various relaxation techniques, meditations, and physical activities; 4) form a trusting interaction with teachers, practice repeated explanation of difficult topics if necessary; 5) provide timely psychologic support; 6) to relieve stress, use various relaxation methods, do sports or work out. It is worth remembering that a low level of stress during studies is a positive thing, since it stimulates students' productivity, while excessive stress (distress) means negative effects for all aspects of health and academic performance.

Knowledge of social and ecological stress factors enables adults (parents and teachers) to take certain actions to eliminate stress conditions and ensure favorable and trustful environment for comfortable studies. In this regard, it is also necessary to enable schoolchildren to express their emotions and report their problems in timely manner. Another important aspect is to support schoolchildren in their development of stress-handling skills. Schoolchildren should be taught to have their own opinions and be strong enough not to yield to wrong ideas from their surroundings. Parents and teachers need to support children and help them to overcome social pressure. In case of unfavorable family circumstances, teachers cannot treat schoolchildren contemptuously due to their poor academic results or behavior, but support them and express understanding. Psychologic counselling should be organized for both children and their parents. School psychologists need to develop a program of psychological support, conduct trainings on stress and emotional self-regulation, as well as control the psychological climate in classes where such children attend. To eliminate physical stress from schoolchildren's lives, they need to be taught healthy lifestyle habits. Educational institutions can use breaks for physical activities; introduce sensible nutrition menus in their canteens; organize events to promote healthy lifestyle among schoolchildren. Also, in order to reduce physical stress educational institutions can provide schoolchildren with free access to pure water, comfortable recreation areas or hygiene accommodations.

To reduce stress conditions in schoolchildren, it is worth doing the following: 1) encourage positive self-esteem and confidence, ability to accept failures and mistakes when studying; 2) teach schoolchildren to handle stress on their own; support each other; 3) provide an opportunity for schoolchildren to develop at their own pace, without pressure on the part of adults. This will reduce the level of stress and improve schoolchildren's psychological condition considerably. Therefore, the school period in a child's life can be accompanied with a number of stress factors in the educational environment, along with certain positive aspects. Results of this research have indicated the similarity of stress factors of the educational process which affect modern schoolchildren during the war in Ukraine. In particular, conducting an anonymous questionnaire survey for the parents of the studied schoolchildren demonstrated directly that the children had a high level of anxiety in conditions of the full-scale war in Ukraine. Their parents noted that almost half of the studied children felt anxiety and sadness very often. This fact indicates that the studied schoolchildren have been found to experience a stress condition and a high level of anxiety in connection with the full-scale war. The main causes of academic stress in studied schoolchildren, according to the Test for Determining Academic Stress by Y.V. Shcherbatykh have been identified as follows: heavy academic workload – 8.8%; fear of future – 8.7%; inability to organize a strict schedule – 8.6% and too serious attitude to studies – 7.3%. These causes may provoke considerable deterioration of children's health and a decrease in the quality of their academic achievements.

The obtained results regarding changes in the permanent stress level experienced by the studied schoolchildren throughout December 2022, January and February 2023 indicate that the gymnasium students had a low level of stress resistance which affected their emotional state and caused inability to handle stress effectively. It is known that schoolchildren who lack the skills to control their own emotions and stress effectively are bound to face overload, lose concentration, and their academic performance will deteriorate soon. The main manifestations of stress have included: feeling permanent lack of time; feeling of helplessness, inability to cope with problems; sleeping badly; low working capacity, increased tiredness; inability to drive away strange thoughts and bad mood, depression. Permanent lack of time and feeling of helplessness indicate the state of being overloaded, inability to manage one's time effectively and handle problems. Experiencing bad sleep and low working capacity result from psychological tension which affects quality of sleep and overall level of energy. Inability to drive away strange thoughts indicates permanent absent-mindedness and concentration on negative factors. Bad mood and depression indicate one's inability to cope with stress effectively. Mostly, stress is still manifested on a psychological level, but with regular and prolonged exposure, its effects will begin to appear on a physiological level as well. From now on, the already available ailments should be considered closely: headaches (4.5%), accelerated heartbeat, heartache (3.5%), muscle tremor or tension (2.8%), gastro-intestinal tract issues (2.3%) and trouble breathing (1.9%). The most popular methods to overcome stress have become socializing with friends (19.4%), intervals in studies (16.1%) and sleep (14.6%). This is a good sign, since communication with friends provides support, distracts from stress situations, and gives a good opportunity to share feelings and receive advice or sympathy. Such social support also helps to reduce the stress level and improve mood. Such intervals in studies as short periods of rest or change of activity allow children to relax as well as renew their energy and reduce tension. Rest and recuperation through sound sleep promote stress reduction and general well-being improvement.

At the same time, it is a positive sign that the studied schoolchildren do not use alcohol and drugs to relieve stress. However, obviously following the example of their own parents or other adults, some of them have already started smoking to handle stress (5.9%). This fact should be paid attention to, and preventive action should be taken to eliminate this addiction. According to this test instructions, anxiety before tests assessed at 1 point (5.7%), 2 po ints (5.3%), 3 points (12.4%) and 4 points (2.8%) indicated good self-control and ability to withstand stress situation and maintain high level of concentration. According to the instruction, the average level of anxiety before tests is 6.0 ± 0.35 points. Therefore, the studied schoolchildren who assessed their anxiety at 5 points (8.5%), 6 points (14.2%) and 7 points (20.1%) react to a stress situation in an emotional way, but they know how to control it. At the same time, they have low concentration and increased distraction levels. The abovementioned 8 points (12.6%), 9 points (10.2%) and 10 points (8.2%) indicate lack of self-control and lack of ability to overcome stress conditions. Before tests, the low level of worry has been found in 26.2% of the studied schoolchildren which indicates their relative calmness and confidence of their knowledge and proper revision for tests. The medium level of worry (42.8%) means that such children experience certain anxiety or partial lack of confidence as to their knowledge and skills. The high level of worry (31.0%) indicates a high degree of anxiety and stress, which has a negative impact on effectiveness and results of school tests. At the same time, it should be noted that worrying before tests is a normal reaction among schoolchildren. However, if such worries hinder studies, effective methods should be applied to reduce such emotions, or a psychologist should be consulted. All the abovementioned physiological reactions of children's bodies before tests indicate a physical and emotional response caused by nervousness, anxiety, and tension. For instance, accelerated heartbeat appears due to activation of the sympathetic nervous system. Dry mouth appears as a response to stimulation of the said sympathetic nervous system, which reduces saliva secretion. Trouble breathing is a manifestation of increased respiratory activity or changes in the breathing rhythm related to stress. Headaches or other pains as well as stiff muscles appear due to tension of muscles and corresponding systems of the human body during a stress reaction. Muscle tremor is another reaction to stress caused by reduction in muscle coordination or activation of the nervous system. These symptoms vary from human to human, so each person has their own reaction to stress.

Therefore, the obtained results of the test to determine academic stress have demonstrated that the educational process can have a great negative impact on the health and academic performance of schoolchildren. The low level of stress resistance causes emotional imbalance and makes it more complicated to manage stress effectively. Manifestations of stress may start to appear not only on psychological, but also on a physical level. Methods to overcome stress are dominated by communication with friends, intervals in studies, and long periods of sleep. The studied schoolchildren do not use alcohol and drugs to relieve stress, but start smoking. A moderate level of worrying before tests is observed among the children, which is believed to be normal. Meanwhile, physiological symptoms indicate physical and emotional reaction of their bodies, including nervousness, anxiety and tension.

According to the results obtained with the test of self-assessment of stress resistance by S. Cohen and G. Williamson most of the studied schoolchildren (33.2%) have demonstrated poor and very low (8.5%) stress resistance levels, which can be related to the war in Ukraine and its effects on the civilian population. Only 4.8% of the studied children demonstrate a high level of stress resistance, which indicates their ability to overcome stress situations effectively in the present-day conditions. Satisfactory and good levels of stress resistance have been demonstrated by 28.8% and 24.7% of the children, respectively. Having summarized these results, we should note that excellent stress resistance is demonstrated only by 4.8%, satisfactory – by 53.5% and poor – by 41.7% of the studied children. Satisfactory stress resistance indicates that the children have sufficient resources to manage stress effectively. They usually react to complicated situations in a deeply emotional way, but then recuperate quickly and adapt to new conditions of their studies and social environment. Poor stress resistance indicates that the children have insufficient resources to manage stress, get adjusted easily, or concentrate on overcoming available difficulties. This situation has a direct influence on the quality of their studies, their feelings and overall well-being. In this connection, there is an urgent need to apply effective measures to bring stress resistance to a high level in conditions of the large-scale Russo-Ukrainian war in Ukraine. These measures may include: psychological support, trainings in stress management and development of personal skills that will help children overcome stress conditions more effectively and build up a positive base of resources.

According to the test of resilience by S. Muddy (adapted by D.A. Leontiev and Ye.I. Raskazov), the high level of resilience indicates that 22.1% of the studied schoolchildren have a high ability to overcome challenges of life effectively, counter stress and various difficulties, while continuing to grow and flourish. The medium level of resilience indicated that during the war 57.9% of the children are able to adapt to unfavorable conditions, live normal lives and continue their studies. Thanks to support from parents, teachers and peers they have both physical and emotional endurance and are able to withstand stress situations. At the same time, the medium level of resilience in wartime conditions of Ukraine may be different depending on the duration of combat operations in the vicinity of their habitation and on their access to educational institutions. The low level of resilience indicates that 20.0% of the studied children had lack of confidence, fear, anxiety, and feel potential threats to their safety. All these factors excite

negative feelings which affect their level of resilience. For this group, it is necessary to apply certain measures to protect their well-being and ensure proper accommodation and education conditions. Hence, results of the test of resilience by S. Muddy (adapted by D.A. Leontiev and Ye.I. Raskazov) give evidence to the distinctness of the measured indicators of the schoolchildren, and to their being dominated by medium-level resilience individuals.

DISCUSSION

In their research A. Kadir *et al.* (2018) pointed out that wars or armed conflicts have a negative impact on overall health and behavior of schoolchildren in various age categories. Results of our research also indicate physical and emotional reaction of schoolchildren's bodies during the war in Ukraine, including nervousness, anxiety and tension. A similar opinion is expressed by G.J. Jucier *et al.* (2022): permanent combat operations threaten the health and lives of Ukraine's underage population. M. Mohseni *et al.* (2020) also emphasize that children's health has never improved but always deteriorated as a result of armed conflicts or wars. G.M. Danylenko *et al.* (2023), while studying mental state of internally displaced children in wartime conditions, also noted that in comparison with the prewar period, a third of children and teenagers faced deterioration of mental health, increased level of negative emotions, and suffered from headaches, dizziness, accelerated heartbeat, stomachache without obvious reasons, which indicates presence of a psychosomatic pathology. Results of this research has also found similar manifestations in the studied group: headaches, accelerated heartbeat, heartache, trouble breathing, muscle tension / tremor, gastro-intestinal tract issues. That is why, in order to improve stress resistance of Ukrainian schoolchildren in conditions of the large-scale Russo-Ukrainian war, effective action should be taken immediately: psychologic support, trainings to develop skills to overcome stress conditions effectively etc. The same opinion is held by G. Milas *et al.* (2021), who suggest obligatory application of various specialized preventive and educational programs to reduce effectively the stress level among schoolchildren.

Teaching schoolchildren at institutions of comprehensive secondary education in the conditions of the Russo-Ukrainian war has a negative influence on their physical and mental health. It is closely connected with the effects of such negative stress factors as psychological stress, oversaturation with information, bullying, regular ailments, increased anxiety due to air raid alerts, combat operations, and life in occupied territories of Ukraine. In a modern dictionary compiled by I.I. Prykhodko (2021) the term "stress" is defined as well as its kinds (combat, psychological, traumatic, physiological stress) and descriptions of stress behavior, types of stressors, and stress resistance are provided. Stress factors are any factors whose power of influence exceeds adaptive reactions of a body or system, but too much so as to cause lethal outcomes. The influence of such factors is facilitated by extreme living, learning or work conditions. Stress factors during distance learning in conditions of COVID-19 pandemics were analyzed in the article by H. Stelmashchuk (2021). During the recent years, the number of researches focusing on the interrelation between stress and schoolchildren's emotional well-being has increased in the scientific field. For example, M.E. Rodríguez-Rivas *et al*. (2023) analyzed the correlation between a stress condition and life satisfaction in teenage Chilean students during the period of distance learning. They have also established that the feeling of stress has a negative influence on life satisfaction. J. Guzmán *et al*. (2020) noted that schoolchildren's overall life satisfaction largely affects the relation between mental health risks and perception of academic and social functioning. Scientific research also indicates the importance of the role played by educational community in how teenage schoolchildren perceive the level of stress. In particular A.W. Van Loon *et al*. (2020) emphasized that the school environment during classroom learning accompanied by various extracurricular and sporting events have a positive effect in reducing stress levels and ensure that schoolchildren have a higher level of well-being. C. Esposito *et al.* (2021) discovered that in the circumstances when usual personal communication was impossible, online communication filled the gap between peers and this considerably reduced the feeling of isolation and decreased manifestations of psychological stress. Support on the part of the educational institution, the teaching staff and classmates plays an important role in this process. In their research M.D. Lyons & X. Jiang (2022) concluded that support from teachers and classmates has a positive influence on the quality of life and reduces the negative impact of stress on schoolchildren. G. Milas *et al*. (2021) pointed out that in order to improve young students' mental health, special preventive and educational programs should be applied to reduce stress levels.

The negative stress factors that influence schoolchildren's health considerably include bullying. The problem of bullying has been concealed for a long time. The Constitution of Ukraine declares that the main rights of a person and citizen are the inalienable right to life, freedom and inviolability, respect of their honor and dignity (Constitution of Ukraine – Section II., n.d.). In this connection, a series of publications dedicated to this problem have appeared in the scientific environment. In particular, the bibliographical reference by N.L. Karpinska (2019) for head teachers, form teachers, subject teachers and teenagers reveals the essence of bullying and its types, causes and consequences. Also, this reference provides comprehensive information regarding policy of the state in protecting children and their rights. Considering pedagogical violence, scientists E. Matusov & P. Sullivan (2020) remarked that there are various forms of psychological and social violence that affect students' health, provoke physical, social and psychological pathologies, such forms being either a means of teaching or deliberate side effect of teaching that are used on a regular basis. It can be manifested as violent reactions from both students and teachers, and it can be directed

against other learners or members of the teaching staff. In the corresponding article, R. Volosheniuk (2019) concludes that cyberbullying is a dangerous form of virtual aggression. In the study of bullying and teenage mental health, R. Ringdal *et al.* (2021) discovered that bullying is combined with decreasing levels of mental well-being and increasing symptoms of anxiety and depression. In exploration of bullying in a school environment, J.M. Aldridge *et al.* (2020) provided recommendations for school teachers on improving schoolchildren's mental health by ensuring their work in a favorable psychological and social school environment.

Therefore, summing up the abovesaid, in the conditions of the Russo-Ukrainian war it is important to take immediate action such as psychologic support and trainings in order to strengthen the stress resistance of Ukrainian schoolchildren. These research works also emphasize the significance of implementing preventive and educational programs intended to reduce schoolchildren's stress levels as well as prevent bullying.

CONCLUSIONS

In connection with the full-scale Russo-Ukrainian war, the studied schoolchildren demonstrate all symptoms of stress condition and anxiety. Due to the importance of reducing the levels of anxiety and stress, it is necessary to take effective action for that purpose, as well as for ensuring their well-being in the realities of the current war. The causes of academic stress as identified above may provoke considerable deterioration of children's health and a decrease in the quality of their academic achievements. Low level of stress resistance affects their emotional state and inability to manage stress effectively. So far, stress is mostly manifested on a psychological level, but with regular and prolonged exposure, its effects will begin to appear on a physiological level as well. The most popular methods applied by schoolchildren to overcome stress are socializing with friends, taking breaks from studies, and sleeping. They do not use alcohol and drugs to relieve stress, but have begun to use smoking for that purpose. Schoolchildren mostly experience medium level of worry before tests, which complies with general norms. The identified children's physiological reactions before tests indicate a physical and emotional response of their bodies caused by nervousness, anxiety, and tension.

The studied schoolchildren predominantly demonstrate satisfactory and poor stress resistance which indicates the corresponding unsatisfactory emotional state and poor ability to adapt to current wartime challenges and difficulties that they have to face both at home and at educational institutions on a daily basis. Stress resistance is an important skill that can be developed. For this purpose, trainings including relaxation and self-regulation techniques should be held, psychologic support should be provided, and positive surroundings created both at home and at educational institutions. The studied children mostly demonstrate a medium resilience level. It indicates that during the war, children are able to adapt to unfavorable conditions, live normal lives, and continue their studies, thanks to the support from their parents, teachers, and peers. Further research will consist in development and implementation of strategies, programs, complexes of training sessions, psychological recommendations that would be intended to manage stress conditions, form schoolchildren's stress resistance and resilience, which could greatly improve the quality of their studies, academic performance, somatic and psychological conditions. After all, it is by working hard to overcome stress at its early stages that secondary education applicants can receive an important tool to use throughout all of their lives while overcoming difficulties and achieving success.

ACKNOWLEDGEMENTS

We would like to thank the administrations of the gymnasiums in Pereyaslav, Kyiv region. Pereyaslav, Kyiv region, which made the study possible.

CONFLICT OF INTEREST

None.

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Оцінка впливу стресогенних факторів освітнього процесу на психосоматичне здоров'я школярів в умовах російсько-української війни

Анотація. В умовах повномасштабної російсько-української війни спостерігається зростання випадків депресії, апатії, тривоги і різних її розладів, а також інших психологічних проблем, що впливає на навчання і психосоматичне здоров'я школярів в Україні, що робить дану проблему важливою для вивчення. Метою дослідження було охарактеризувати види стресогенних факторів в освітньому середовищі та їх можливі наслідки впливу на організм школярів за умов мирного і воєнного часу; експериментальним шляхом оцінити реальний стан впливу шкільного стресу на психосоматичне здоров'я школярів. Теоретичний метод дав змогу проаналізувати, синтезувати, систематизувати й узагальнити наявну інформацію щодо стресогенних факторів освітнього процесу для школярів у науковій літературі. Експериментальне дослідження здійснювалося серед учнів гімназій міста Переяслава Київської області. Анонімне анкетування батьків використано для визначення наявності тривожності, причин виникнення та наслідків для досліджуваних. Серед досліджуваних гімназистів проводилися тестування на визначення навчального стресу, визначення самооцінки стресостійкості та життєстійкості. Встановлено, що освітнє середовище закладів освіти України в умовах війни характеризується появою низки стресогенних факторів. Досліджувані гімназисти мали високий рівень тривожності, низький рівень стресостійкості та середній рівень життєстійкості. Отримані результати тесту на визначення навчального стресу засвідчили те, що освітній процес має негативний вплив на стан здоров'я й академічну успішність школярів. Зростання стресогенних факторів під час широкомасштабної російсько-української війни негативно позначилося на психосоматичному здоров'ї, академічній успішності і соціальній адаптації школярів до навчання. Результати цього дослідження можуть бути використані для розробки та впровадження психопрофілактичних заходів, спрямованих на зменшення негативних стресових станів у школярів як у шкільному середовищі, так і в домашніх умовах, тим самим сприяючи створенню сприятливого психологічного середовища та благополуччя

Ключові слова: стрес; учні; стресостійкість; життєстійкість; тривожність; академічна успішність

Vol. 2. No. 2. 2023 Scientia et societus
Received: 29.07.2023.
Revised: 31.10.2023.
Accepted: 12.12.2023.
Journal homepage: https://ses.journal.in.ua/index.php/ses/issue/view/4
UDC 378.4
DOI: 10.69587/ss/2.2023.22

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Current trends in radiation safety education in the digital educational environment: Challenges and opportunities

Abstract. The population's level of radiation literacy needs to be increased due to the significant rise in the use of radiation technologies in medicine, industry, science, and other fields. Simultaneously, the rapid development of digital technologies and increased access to the internet for a significant portion of the world's population have created new opportunities for radiation safety training and awareness-raising. The purpose of the study was to examine current areas and methods of teaching radiation safety in the era of digital education, to identify important challenges faced by educational institutions and students, and to identify opportunities for using modern technologies.The research employed theoretical analysis of information sources, systematization, deduction, modeling, and generalization. The article analyses the potential of modern digital learning tools in studying radiation safety. It substantiates the structural and logical scheme of using educational web resources for this purpose. The article also proposes tools for diagnosing the level of subject competence and approaches to ensuring reflection and self-reflection of the subjects of the educational process. The identified components of radiation safety training include accessibility of educational information, quality interaction of participants, objective evaluation of results, and reflection and process analysis, specialized web services have also been identified to aid in their implementation in a digital educational environment. The study's results will be valuable for training non-specialists who may encounter radiation risks from domestic, man-made, natural, or military sources, they will also be useful for specialists studying ways to improve radiation literacy among different segments of the population

Keywords: radiation literacy; ionising radiation; augmented reality; virtual reality; competence diagnostics; digital learning tools

INTRODUCTION

The modern world requires continuous transformation and development of the radiation safety (RS) education system due to the growing use of radiation technologies in medicine, industry, science, and other areas. At the same time, the rapid development of digital technologies and increased access to the Internet for a significant number of the world's population create new opportunities for learning and raising awareness of RS. In these circumstances, it is recommended to assess how current trends in radiation biology education impact the educational environment, the challenges they present to educational institutions, and the opportunities they offer in the context of utilising the latest digital technologies. Understandably, interest in radiation education is significantly increasing in countries that have experienced the consequences of radiation disasters.

In particular, researchers T. Sawano *et al*. (2018) emphasise the importance of radiation education for all segments of the Japanese population. They suggest that continuous and sustained radiation education is necessary to increase the overall level of knowledge after the Fukushima nuclear power plant disaster. Studies have shown that there are significant gaps in the general population's knowledge of radiation, which are due to imperfect approaches to teaching radiation safety basics (Sadigh *et al*., 2014). The expansion of radiation technologies in industries, agriculture, and research has led to a need to improve radiation

Suggested Citation:
Tymoshchuk, O. (2023). Current trends in radiation safety education in the digital educational environment: Challenges and opportunities. *Scientia et societus*, 2(2), 22-30. doi: 10.69587/ss/2.2023.22.

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literacy among the younger generation in some countries. For instance, innovative demonstration tools are used to teach radiation literacy to secondary school students in Sri Lanka at the national level (Ranasinghe *et al.*, 2019). Training to improve radiation literacy among the younger generation is conducted with the assistance of the International Atomic Energy Agency (IAEA) and the University of Tokyo to meet national requirements. According to some researchers, game-based learning methods have been highly effective in teaching primary school students about radiation and its associated risks (Yamaguchi & Horiguchi, 2021). Studies have shown that radiation awareness is essential for kindergarten teachers in areas with potential radiation risk or those affected by radionuclide releases (Moriyama *et al.*, 2022). Additionally, companies that use nuclear technologies are actively involved in public radiation education. An example of this approach is energy tourism, which involves observing the operation of nuclear facilities to form ideas about safety and security (Gerulaitienė & Mažeikienė, 2021). It is important to note that radiation safety training is actively implemented at national and international levels. The Asia-Pacific region has a pilot project for intergovernmental cooperation at the secondary school level. The project aims to involve experts in developing educational tools to promote radiation literacy among schoolchildren (Iimoto *et al.*, 2019). It has been established that the introduction of radiation technologies requires the improvement of general radiation and special training in this area. This, in turn, will reduce public concern about man-made and terrorist accidents at nuclear facilities (Cho *et al.*, 2019). Considering the issues outlined in the presented studies, it is imperative to improve radiation literacy among people of all ages, regardless of their location or professional activities. Therefore, this study aimed to investigate current trends and methods of teaching radiation education in the digital era. The task was to identify the significant challenges faced by educational institutions and students and opportunities for using modern technologies.

MATERIALS AND METHODS

The study is based on a theoretical and review approach and does not contain empirical results of an experimental nature. In the course of the study (initial stage), the method of analyzing modern practices of teaching radiation safety in the digital educational environment was used. Based on the results of the analysis, they were differentiated depending on their characteristic features, and the following groups of educational practices for radiation safety education were identified "use of virtual and augmented reality tools", "use of multimedia visualization tools" and "interactive interaction of participants in the education process". The approaches to teaching radiation literacy identified in the study were compared with the current needs of the educational process. At the same time, the research was based on the study of the didactic potential of digital learning tools through their critical analysis. In particular, the possibilities of remote access to educational materials such as Google Drive and Dropbox were investigated. The criteria used to analyze them included ergonomics of use, collaboration tools, opportunities for differentiated learning, integration with other learning resources, security, and privacy. The study also analyzed the diagnostic tools of the web services Google Forms, Kahoot, Quizizz, namely the possibilities of assessing students' learning achievements and reflection. These services were evaluated according to the following criteria: the ability to create different types of tasks, integration with other educational resources, and the ability to analyze the results. The Google Analytics web service was studied as an analytical tool for the effectiveness of radiation safety training in a digital educational environment. In particular, its capabilities in terms of collecting data on visitors, their geolocation, the pages they view, and the duration of their visits to web resources were evaluated. The possibilities of "Google Meet" and "Zoom" in the context of ensuring social, digital, and interactive interaction of participants in the educational process are investigated, in particular, the possibilities of video conferencing, file sharing, recording classes, questionnaires, and surveys are analyzed.

The optimal tools for achieving the goals of radiation safety training were selected by modelling training cases and analyzing the didactic potential of existing tools. The most effective tools for teaching radiation safety in a digital educational environment are identified using scientific methods of comparison and contrast. These tools are differentiated based on their accessibility to educational information, quality of participant interaction, objective evaluation of results, reflection and self-reflection, and analytical tools. The study's findings are presented through hierarchical and cyclic diagrams. The materials used for this study included scientific publications, regulatory documents, statistical data, and technical specifications of digital learning tools, as provided by the manufacturers' websites. The study utilized academic search engines such as "Google Scholar" and "Microsoft Academic Search", as well as electronic journal databases like "Open Journal System" and "Scimago Journal & County Rank". Additionally, it drew upon materials from international projects, including the "EURAMED Rocc-n-Roll project survey (Education and training in radiation protection in Europe, 2023)" and "Synergy for Nuclear/Radiation Asian Teacher/Student Development (2019)". The presented materials are not subject to any restrictions on information disclosure or data access.

Results

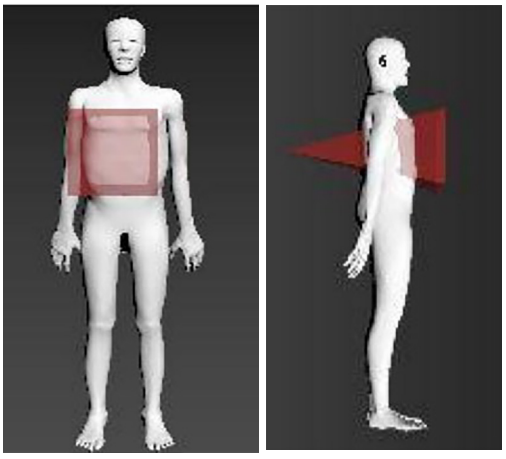
One important area of pedagogical research and educational policy is the process of digitalization in education. The goal of education is to ensure that all participants in the educational process have mastery of digital skills and competencies, which is an important factor in the comprehensive and successful development of society and the economy of the state as a whole. Learning in a digital educational environment is a new area of pedagogical research (Schüler, 2019). The digital transformation of the

educational environment requires the appropriate retraining of both teachers and higher education students. Israeli scholars have identified two strategies for digitalizing the educational environment: conservative and skeptical. According to the conservative view, the digitalization of the educational process involves adapting educational organizational and technical approaches to modern computer science technologies, while the skeptical view, on the other hand, requires a complete transformation of the pedagogical process, including a fundamental rethinking of the interaction between participants in the educational process, this is referred to as the postmodern interaction between teachers and students (Aviram & Eshet-Alkalai, 2006).

Learning in the digital learning environment is considered in terms of the following strategies: social and virtual, Internet-based resources, interpersonal communication on the network, and digital tools (Ferdian & Chayanuvat, 2017). The digital learning environment contributes to more effective cognitive engagement of students, resource management, and the formation of motivational beliefs (Anthonysamy *et al.*, 2021). However, the digitalization of the educational environment has both advantages and disadvantages. While there are positive examples, studies have also identified a decrease in the motivation of higher education students in online teaching and learning. It is important to note that in digital learning environments, students' intrinsic motivation is the primary driving force, and the teacher's motivating influence is somewhat reduced, that can have an impact on the level of learning and cognitive activity (Hartnett, 2016). Teaching in a digital learning environment requires both comprehensive pedagogical and technical training. According to J. Macleod *et al*. (2018), higher education students place the greatest value on learning environment tools that facilitate negotiation, experiential learning, reflection, ease of use, and usefulness. The quality and ease of communication, as well as the design of applications, are noted to play a crucial role in student engagement.

The teaching of radiation safety in the digital educational environment is often studied as a scientific problem with a focus on training specialists who work directly with radiation sources. However, studies on the formation of radiation literacy using digital means are fragmented and do not adequately address the current challenges and opportunities of the digital educational environment. For instance, A. Tekbiyik (2015) outlines the means of interaction, reflection, and collaborative learning in forming objective views of bachelors (future science teachers) on the use of nuclear energy. The author argues that distance learning, exclusively used in this case, allowed for a wider audience and collective learning through information and communication technologies (ICT). The educational presentation aims to enhance comprehension of the physical basis of ionizing radiation and its effects on the human body. The use of digital learning tools facilitates a high level of understanding of alpha, beta, and gamma radiation, which in turn promotes competence in radiation protection basics (Ribeiro *et al.*, 2020). Digital technologies significantly enhance communication between participants in the educational process, provide high-quality visual representations of information, and expand the possibilities for visualizing certain processes in static and dynamic conditions. Ukrainian researchers have developed immersive technologies for training personnel working with nuclear technologies, based on augmented and virtual reality (Popov *et al.*, 2021). Modeling the operation of hazardous equipment is a key aspect of using these digital tools, resulting in a higher level of safety and improved basic training of personnel. Thus, digital technologies not only serve a didactic purpose but also contribute to health protection and the development of competencies for safe human activity in the face of radiation risks.

The Department of Engineering and Applied Physics at the Chinese University of Science and Technology (Hefei) conducted a study on the integration of virtual reality (VR) technologies with dosimetric equipment, the researchers developed a virtual reality application for this purpose. The virtual visibility headset is used in conjunction with radiological equipment. The student can 'see' the spatial distribution of the X-ray field and the dose rate is displayed on the screen in real time (Guo *et al.*, 2020). This allows them to adjust their actions and minimize the harmful effects of radiation on the body while developing safe behavioral skills. The approach described should be used to understand the geometric parameters of radiation propagation. For instance, an augmented reality tool that illustrates the areas of exposure of the human body could be effective in comprehending the geometric outlines of X-rays during radiological chest diagnosis (Fig. 1). This tool helps students to understand the geometry of radiation visually. The provided conditions explain how the placement of the ionizing radiation source and the detector affects the geometric parameters of radiation. It is important to include information on safe behavior during such procedures, minimizing radiation dose absorption, and personal hygiene measures.



A B

Figure 1. X-ray image of a human being
Notes: A - top view; B - bottom view
Source: Y. Guo *et al*. (2020)

In terms of using augmented reality tools, it is recommended to employ methods for detecting or marking target objects or locations during RS training. As suggested by F. Biocca *et al*. (2007), this approach can be useful for identifying potentially hazardous objects by marking them with a frame. In the study of RS, augmented reality tools can be used to train personnel working with radioactive materials by creating simulation situations and virtual training programs. According to the results of surveys presented within the framework of the Euramed project, the main task of the pedagogical community, whose specialists teach the disciplines of the cycle of emergency response, is to adapt curricula and teaching methods to the practical side of protection against radiation threats (Santos *et al*., 2023). In this context, the project method deserves significant attention. As part of project preparation, students demonstrate their competence in safety basics through a personality-oriented approach to assessing learning achievements. The implementation of projects is made possible by numerous web applications that improve the structure of the material, graphic content, and interactive effects.

A number of studies focus on the active interaction of participants in the e-learning process dedicated to the formation of radiation literacy. It is recommended to organize electronic or distance learning sessions that focus on interactive participation, allowing participants to acquire new knowledge independently (Zafar *et al*., 2014). Some researchers argue that online learning has no positive impact on radiation safety. For instance, a study suggests that professionals working with medical radiation technologies have low rates of competence improvement in radiation risk prevention. Practitioners who use radiation diagnostic tools did not significantly increase their level of competence after completing specialized online courses, as evidenced by the results of the Kirkpatrick assessment (Kowalczyk, 2014). Based on the experience described above, it is evident that investigating the mechanisms of interaction among participants in the educational environment during digital transformation is a pertinent and pressing matter. However, it necessitates the exploration of effective methods for teaching RS. Certain studies have focused on personalized learning trajectories, where the student can manage the process of knowledge acquisition and track personal progress. Such an approach with the use of digital technologies is interpreted as "self-regulated learning" (Johnson & Davies, 2014; Xia *et al*., 2023). Organizing learning in this way requires planning and managing time, effort, and resources. Learners who develop plans and strategies to achieve personal goals are actively engaged in learning. Web-based technologies are particularly suitable for facilitating active engagement of learners in the learning process (Sahni, 2023; Huang & Wang, 2023). Therefore, to improve the effectiveness of radiation safety and radiation literacy education in the digital environment, it is recommended to analyze the potential of existing web-based tools.

Dropbox is a cross-platform file sharing service that enables users to upload files to a server. One of its key features is the accessibility of resources from any device, including computers, tablets, and smartphones, regardless of the operating system. Additionally, the user interface allows for file creation and editing, making it possible to prepare training reports remotely (Dropbox Help Centre, 2023). Google Drive (2023) is a multitasking service provided by the digital Internet giant that offers a wide range of tools for accessing learning materials. In addition to storing and synchronizing files on the server, Google Drive enables users to create and collaboratively edit various file types. The service also allows for the storage of photos, drawings, audio recordings, and videos, with each user being provided with 15 GB of disk space. The tools included in Google Drive are: Google Drive offers a suite of tools including Docs, Sheets, and Presentations. It also provides powerful access management features, allowing for personalized access with the ability to copy, edit, and distribute files. This helps to ensure organized access to educational materials and protects against copyright infringement of teaching materials (Google Drive Help, 2023).

The importance of objectively assessing students' learning achievements in the digital learning environment cannot be overstated. This is highlighted in a study on digital knowledge assessment by B. Thoma *et al*. (2019), which identified the use of machine (test) control in combination with communication as an approach. It is important to note that the most objective results of diagnosing learning achievements can be guaranteed if the individual professional and social attitudes of students are taken into account (Kümmel, 2020). Diagnosing the level of knowledge of radiation risks is challenging due to the complexity of the cognitive dimension, as well as the motivational and axiological assessment. Ultimately, modern web-based knowledge assessment tools should be utilized to diagnose the level of knowledge regarding radiation safety. Quizizz is a service that enables the creation and publication of tests of varying complexity on a user's profile, with access granted to specific users. Additionally, audio, video, and graphic files can be attached to questions to enhance comprehension of the topic. The teacher can monitor the completion, comprehensiveness, and timeliness of test tasks. Kahoot is a platform specifically designed for conducting surveys and tests, suitable for various age groups. It also enables the integration of graphics and videos (Quizizz Help Centre, 2023). The Test and Lesson Designer was developed with the support of the Ministry of Education and Science of Ukraine. It enables users to create an unlimited number of tests and store them on the free platform of the same name. The service provides detailed statistics on diagnosing the level of knowledge and skills, allows for test time planning, and stores the results (Test builder "Vseosvita", 2023).

Another approach to optimize the process of learning about radiation is through the use of interactive animations. Animations can aid in understanding complex numerical indicators of radioactive radiation, particularly for individuals with low radiation literacy (Housten, 2020). For instance, animations can be utilized when studying

radiation sources such as the sun, nuclear reactors, household radiation sources, medical radiological equipment, radioactive waste, and natural materials. To ensure comprehensibility and logical structure, it is recommended to present the animation linearly, beginning with natural radiation objects and concluding with household and man-made ones. This approach also facilitates the learning process of radiometric equipment operation by analyzing its structure and use step by step (Bakri, 2019). To comprehend the intricate processes of ionizing radiation propagation in space, we developed a 3D animation module that simulates the propagation of radioactive gas in residential premises (García-Tobar, 2020). The integration of animation visualization tools into the study of various types of electromagnetic radiation has yielded significant results (Ambarwati *et al.*, 2019). The utilization of animation is particularly effective for self-study and developing critical thinking skills in students (Fig. 2).

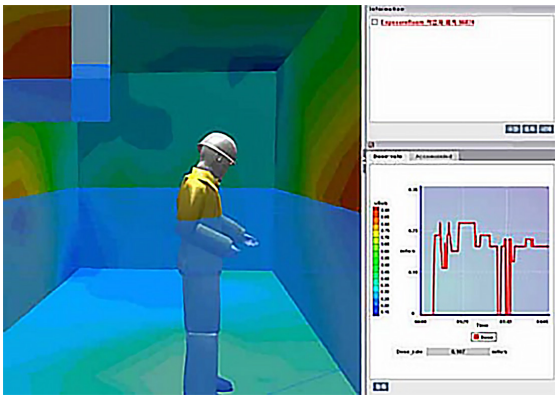


Figure 2. Animation of modeling employee exposure depending on the activity of the ionizing radiation source
Source: D. Ambarwati *et al*. (2019).

Significant attention in the study of each discipline, including RS, should be paid to the issue of "learning from mistakes" or reflection. The main purpose of reflection is the ability of this tool to improve the teaching practice of a particular discipline (Veine *et al.*, 2020). Reflection and self-reflection is a tools designed to identify gaps between the teacher's theoretical position on the organization of learning and the practical side of direct implementation (Morley, 2011). At the same time, critical reflection is a key means of self-correction of activities, in the context of distance education, of teachers and students in particular (Evans & Nation, 2020). Digital tools of the modern information environment allow to ensure an appropriate level of reflection and self-reflection due to the sufficiently flexible privacy settings, which allow teachers and students to draw objective conclusions. One formality for encouraging reflection is an open online discussion among educational stakeholders (teachers, students, etc.) about diverse aspects of the learning experience. For this purpose, it is advisable to use well-known services for organizing online video conferences, such as Google Meet, Zoom, Microsoft Teams, or their analogs. For informal reflection, such tools are not very effective, as most students are hesitant to speak out about problematic issues in the study of a particular discipline. To solve this problem, it is advisable to use applications that allow for the anonymity of expressing opinions, in particular, such services include testing tools, social networks, etc. The use of digital tools will allow for the prediction of negative and critical scenarios in the educational process, and thus improve the quality of teaching, and as a result, increase the level of competence in the basics of RS.

In the global space, where the analysis of all types of activities is essential, the educational process is no exception. All data can be analyzed and visualized in the form of summary tables and diagrams, allowing for the tracking of correlations between teacher and student performance (Lepouras *et al.*, 2014). The digital learning environment has a wide range of analytical tools that enable the tracking of visitor geolocation, activity, and task completion time. Such tools, like Google Analytics, enable the evaluation of a particular web page based on various criteria, such as the number of visitors, page popularity, duration of stay, and traffic sources. The purpose of analytical educational tools is to select statistical data, process it, and prepare reports that inform management decisions (Sclater *et al.*, 2017). For instance, by using Google Analytics, a teacher can track the time spent on a resource, the specific section accessed, and the duration of use. This information alone enables the teacher to evaluate the effectiveness of learning tools, the level of student motivation, and the usability and comprehensibility of learning materials. The digital learning tools described demonstrate highly effective indicators in the study of RS. At the same time, the analyzed experience is fragmentary and provides certain aspects of the educational process. It is advisable to define a holistic structure for the use of digital learning tools in RS in this discourse.

Considering the significant volume of analyzed works, it can be stated that digitalization of RS learning should be ensured, taking into account the following criteria: accessibility of educational information, quality interaction of participants in the educational process, objective assessment of learning outcomes, reflection and self-reflection, and analytical tools for assessing the learning process. The implementation of these criteria presents several pressing challenges related to the technical, organizational, and pedagogical aspects of the educational process. It is important to note that Dropbox and Google Drive allow multiple users to collaborate, facilitating the quick creation of documents and project management through work schedules, task lists, and spreadsheets. This supports A. Tekbiyik's (2015) view on the effectiveness of collaborative learning. An integrated calendar enables the implementation of a schedule for completing learning tasks by providing intelligent reminders and recording completed iterations. In addition to the web services described above, many others allow the use of cloud storage and collaboration tools. However, Dropbox and Google Drive are the most popular in the educational sector. The author presents the structuraland functional model for using these services in the form of a diagram (Fig. 3).

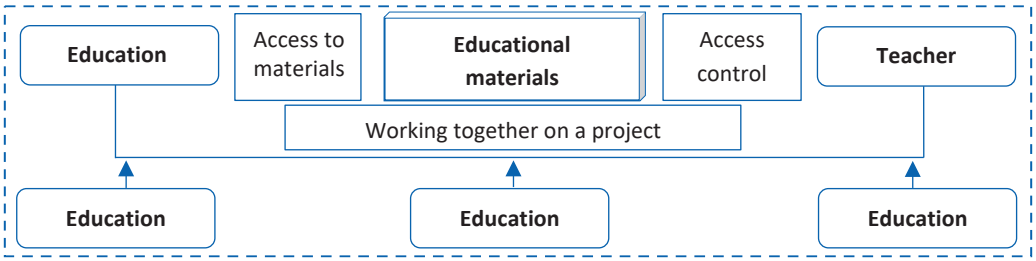


Figure 3. Flowchart of using web services to access educational materials

Source: developed by the authors

To ensure the availability of educational information, virtual and augmented reality, as well as cloud storage services, should be utilized. Additionally, integrating infographics and animation can optimize the process of learning about the RS. Such an approach to presenting information can enhance the process of visualizing complex information. Traditional textbooks and visual aids often lack easy-to-understand graphic materials. It is important to evaluate the effectiveness of digital learning tools in the study of RS. The learning outcomes of the RS can be objectively assessed through various tools in the digital educational environment. It is necessary to use automated assessment systems that enable teachers to create different types of tests, analyze results, and assess student learning achievements objectively and without bias. To evaluate the effectiveness of learning in a digital environment, it is recommended to use Google Forms. This service provides tools to track the general trends of a specific audience through open and anonymous surveys. Additionally, it allows for the collection of summary statistics on specific issues, enabling the identification of general trends. Further discussion is required to determine how to integrate these tools and approaches into the learning process of the Security Council. To illustrate the ways to optimize radiation safety education, the author has provided a hierarchical schematic diagram (Fig. 4).

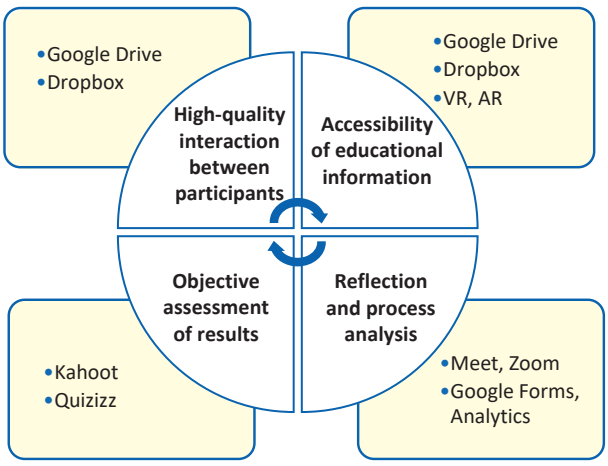


Figure 4. Modern digital tools for teaching radiation safety in a digital educational environment

Source: developed by the authors

The diagram shows potential methods for effectively organizing RS education in a digital learning environment. It is important to avoid using similar tools that lack the necessary features to achieve the desired educational outcome. Effective interaction among participants in the educational process is possible through the qualitative mastery of the described tools and reliable technical support. The development of innovative learning tools deserves considerable attention (infographics, animation, augmented and virtual reality), justification, and verification of the effectiveness of their use in the study of Security Studies. However, it is crucial to maintain objectivity when evaluating their effectiveness. To implement these tools in a digital educational environment, a coordinated and integrated approach is necessary. Educational web resources can serve as a central hub for the use of these tools. The main challenge in using the methods mentioned above to support education is obtaining financial resources for teaching aids, providing specialized training for teachers, and improving teaching methodologies. The RS training system, described here, allows for training to be conducted in vocational and higher education institutions, retraining centers, and training centers of specific enterprises or institutions. Adapting to the requirements of various educational institutions is accomplished through a customized approach to course material, which considers the students' previous knowledge. This guarantees consistency and enables the adjustment of teaching techniques to cater to different age groups.

CONCLUSIONS

Analytical review of modern trends in radiation safety education in a digital educational environment allows to declare a number of intermediate results, namely: research on the integration processes of modern digital technologies for radiation safety study has been widely conducted by researchers from different countries; The majority of recent research focuses on software tools for web technologies and augmented or virtual reality in learning; Modern directions of radiation safety education in a digital educational environment have been identified, such as: accessibility of educational information, quality of interaction between participants, objective assessment of results, reflection and self-reflection, analytical tools in the assessment of the educational process; Based on the tools of analyzed digital learning tools, a structural-logical scheme

of interaction between subjects of the educational process and access to educational information has been developed; Systematization and synthesis of research, as well as digital technologies, allow to develop a process diagram for the use of digital radiation safety learning tools in a digital educational environment.

At the same time, the examples, peculiarities of the methodology of using digital tools in the study of RS, as well as the challenges related to their integration into the educational process, in particular, the insufficient development of digital learning tools, the low level of training of educational subjects in interaction in the digital educational environment, increase the efficiency of RS teaching methods. The article presents effective theoretical foundations for the coordinated use of modern digital teaching aids for RS. By studying the research vectors of the academic community and state and international projects, several trends related to radiation safety education in the digital educational environment can be identified, namely: integration of digital learning tools into all stages of the educational process, adaptation of education to individual needs and characteristics of students, ensuring joint work on projects. These trends create new opportunities to improve the effectiveness of radiation safety education, but they also pose certain challenges for educators. One of these challenges is to ensure the quality of digital learning, ensure student safety prevent information violence, and adapt existing or develop new digital learning tools. Undoubtedly, the outlined study represents the theoretical side of current trends in RS education in the digital educational environment, and it is relevant and appropriate to conduct an empirical study of the effectiveness of the system of the proposed tools, which will be carried out in future scientific developments.

ACKNOWLEDGEMENTS

The author expresses sincere gratitude to the specialists of the Department of General Technical Disciplines, Technologies and Civil Security of Rivne State University of the Humanities for their professional advice on the choice of the methodological apparatus of the study.

CONFLICT OF INTEREST

None.

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Сучасні тенденції навчання радіаційної безпеки в умовах цифрового освітнього середовища: виклики та можливості

Анотація. Необхідність підвищення рівня радіаційної грамотності населення зумовлена значним збільшенням використання радіаційних технологій у медицині, промисловості, науці та інших сферах. Водночас, швидкий розвиток цифрових технологій і збільшення доступу до Інтернету значної кількості населення земної кулі, створили нові можливості для навчання та підвищення рівня обізнаності щодо радіаційної безпеки. Мета дослідження полягала у вивченні актуальних напрямків і методів навчання радіаційної безпеки в епоху цифрової освіти, виокремленні важливих викликів, з якими стикаються освітні інституції та здобувачі освіти, а також виявленні можливостей використання сучасних технологій. Дослідження виконувалося послуговуючись методами теоретичного аналізу інформаційних джерел, систематизування, дедукції, моделювання та узагальнення. Проаналізовано сучасні цифрові засоби навчання та їх потенціал при вивченні аспектів радіаційної безпеки. Обґрунтовано структурно-логічну схему використання освітніх веб-ресурсів для вивчення радіаційної безпеки та запропоновано інструменти діагностування рівня сформованості предметної компетентності, а також підходи забезпечення рефлексії та саморефлексії суб’єктів освітнього процесу. Визначено перелік основних складових забезпечення навчання радіаційної безпеки (доступність навчальної інформації, якісна взаємодія учасників, об’єктивна оцінка результатів, рефлексія та аналітика процесу), а також спеціалізовані веб-сервіси, що сприятимуть забезпеченню їхньої реалізації в умовах цифрового освітнього середовища. Представлені у дослідженні результати будуть корисними при підготовці не профільних фахівців, котрі потенційно можуть стикнутися з радіаційними ризиками побутового, техногенного, природнього чи воєнного характеру, а також фахівцям котрі досліджують аспекти підвищення радіаційної грамотності різних верств населення

Ключові слова: радіаційна грамотність; іонізуюче випромінювання; засоби доповненої реальності; засоби віртуальної реальності; діагностування сформованості компетентності; цифрові засоби навчання

Vol. 2. No. 2. 2023 Scientia et societus
Received: 15.08.2023.
Revised: 18.11.2023.
Accepted: 12.12.2023.
Journal homepage: https://ses.journal.in.ua/index.php/ses/issue/view/4

UDC 378.147 DOI: 10.69587/ss/2.2023.31

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Ways to implement a competency-based approach for the quality training of future professional education specialists (transport, occupational safety and health)

Abstract. The problem of the quality training of future specialists in professional education through the implementation of a competency-based approach when studying the educational component "Occupational safety and health in the industry. Civil protection" remains poorly researched and is of special relevance, since the competency-based approach involves a special organization of the educational process in a higher education institution. Accordingly, the purpose of the study was to reveal the features and ways of implementing a competency-based approach to the quality training of future specialists in professional education (transportation, occupational safety and health) on the example of studying the educational discipline "Occupational safety and health in the industry. Civil protection". To achieve this goal, the following complementary research methods have been used: theoretical analysis, synthesis and generalization of scientific publications, educational and methodological literature, scientific and pedagogical one, and regulatory documentation to make important ideas more understandable, to identify the state of the research problem, to model the organization of educational process and to substantiate the pedagogical conditions for quality training of higher education seekers; the analysis of educational programs, pedagogical activities of HEIs teachers in order to clarify the procedural features of a competency-based approach implementation. The authors highlight the model of the educational process organization in the implementation of a competency-based approach to the training of future professional education specialists in the conditions of the Hryhorii Skovoroda University in Pereiaslav. Such a transition has been found to enable the development of core skills that are crucial for the application of knowledge in the real world, focusing on problem solving, critical thinking and the ability to adapt to changing situations. It has been determined that a competency-based approach contributes to the creation of an educational environment in which students are actively involved in learning, encouraging them to take responsibility for their learning process. In addition, competency-based education is closely linked to the needs of the labor market, ensuring that graduates have the relevant skills and knowledge required by employers, thereby increasing their employability. The use of the results of this research and the implementation of a competency-based approach in professional education can not only improve the educational process, but also make a significant contribution to the training of comprehensively developed, qualified specialists who are ready to solve problems in their fields

Keywords: quality of educational services; competencies; learning outcomes; educational program; educational sector; professional safety

Suggested Citation:
Kamenska, I., & Bokshyts, O. (2023). Ways to implement a competency-based approach for the quality training of future professional education specialists (transport, occupational safety and health) *Scientia et societus*, 2(2), 31-41. doi: 10.69587/ss/2.2023.31.

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INTRODUCTION

The development of skills and competences among students of higher education institutions (hereinafter – HEI) is a key and relevant factor contributing to the sustainable progress of society. The competency-based approach uses a combination of different types of learning (knowledge, skills, and abilities) to create integrated learning outcomes. Through this approach, teachers are expected to enhance the cognitive, communicative, and emotional aspects of students who are seeking higher education.

Since the reform of the national higher education system and the introduction of the Bologna process, scholars and researchers have concentrated on the educational process. The Bologna process has made significant changes to how the higher education system is organized and aimed at guaranteeing the quality of professional training for future academic specialists. Accordingly, universities and academic staff are required to take on new academic roles and functions, which, as noted by foreign scholars (Shobha *et al*., 2020; Prieto-Prieto *et al*., 2024), depend on achieving quality and excellence that ensure competitiveness on a global scale. In this context of changes, a new model of training HEIs students is emerging, which introduces a competency-based approach to education. This model replaces educational systems based on teaching and learning goals and is considered a fragmented system in the educational process (Serrano *et al*., 2019).

In order to prepare future experts in the field of education, the idea of pedagogical development in education outlines important duties for various stages of higher pedagogical education in all its components: preschool, primary (Angelova & Terlemezyan, 2023); secondary (Zhu *et al*., 2020); professional vocational and technical (Marinič, 2023); special pre-university, higher (Ivanytska, 2023), including postgraduate education. By prioritizing the acquisition of competencies, educational institutions have better opportunities to prepare students for the complexities of the modern professional environment. This approach encourages a more personalized learning experience where students are actively involved in defining their educational trajectories based on their career aspirations and the demands of the global labor market. It also fosters a dynamic interaction between teaching and learning, where teachers facilitate the process by guiding, mentoring and providing feedback rather than teaching the material in a traditional lecture format. Ultimately, this competency-based model of education aims to produce graduates who are not only academically prepared, but also adaptive, innovative and capable of lifelong learning to meet the challenges of continuous social and technological change (Scherak & Rieckmann, 2020), who possess the ability to handle challenging problems in the fields of science, education, or research, since this affects the production of fresh, comprehensive knowledge, the acquisition of professional experience, and the useful reorganization of already existing knowledge (Abelha *et al*., 2020). To foster a society's innovative progress and educate forward-thinking experts, educational activities are infused with innovation. This strategy primarily aims to enhance the scientific, technological, and methodological aspects by encouraging the acquisition of scientific knowledge. This knowledge is then applied towards developing and deploying cutting-edge, competitive technologies, equipment, materials, and more (Sapargaliyeva *et al*., 2023).

HEIs have a fundamental role in implementing the principle of sustainable development of society (Spyropoulou & Kameas, 2024). The implemented educational programs are aimed at increasing the competence and changing the attitudes of higher education students, as well as enabling them to take responsibility for participating in the development of the modern world (Belur *et al*., 2022). The requirements of the social system for obtaining higher education and the qualification of a future specialist indicate new ways to form the content of education. The modernization of the educational process takes on a continuous nature and requires the successful implementation of a competency-based approach to the training of HEIs students. The modernization of methods, teaching techniques, forms of organization of educational activities, structure and content of organizational forms to ensure quality training of higher education seekers is an important factor in the successful implementation of a competency-based approach.

The purpose of the study was to reveal the features and ways of implementing a competency-based approach to the quality training of future specialists in professional education (transport, occupational safety and health) using the example of teaching the educational component "Occupational Safety and Health in the Industry. Civil Protection". The research tasks are to reveal the essence of the concept of "competency-based approach", to develop a model of organizing the educational process at Hryhorii Skovoroda University in Pereiaslav (hereinafter – HSUP), based on the legislation of Ukraine and normative documents of HSUP, to theoretically substantiate the importance of studying the educational component "Occupational Safety and Health in the Industry. Civil Protection", to highlight the methods of putting a competency-based approach into practice using the example of instructing the course "Occupational Safety and Health in the Industry. In Civil Protection", the aim is to explain the pedagogical conditions of training in the application of a competency-based approach for high-quality training of future specialists in professional education (transport, occupational safety and health), and to emphasize the benefits of applying this approach.

Theoretical analysis, synthesis and generalization of scientific publications, educational and methodological literature, scientific and pedagogical literature, and regulatory documentation have all been used in tandem to accomplish this goal. These methods have also been used to identify the state of the research problem, model the organization of the educational process, and clarify the essence of key concepts and to substantiate the pedagogical conditions for quality training of higher education seekers;

the analysis of educational programs, pedagogical activities of HEIs teachers in order to clarify the procedural features of the competency-based approach implementation. This is a new study conducted at HSUP, which identifies the ways of implementing a competency-based approach and the pedagogical conditions that should be preferred in the training of higher education seekers for providing the quality training of future professional education specialists.

Modern strategies for implementing a competency-based approach in professional education

The active discussion on the application of a competency-based approach began in the late 20th century and has been the subject of study by Ukrainian and foreign scientists (Novak *et al.*, 2019; Borodiyenko *et al.*, 2023; Puiggali *et al.*, 2023). Ukrainian pedagogical scholars are increasingly using the thesis of the need to introduce a competency-based approach in the vocational training of future specialists in various fields, which is a key factor in the modernization of the educational sector. Therefore, a competency-based approach is of leading importance in regulatory documents that regulate and ensure the sustainable development of educational processes (Kamenska, 2019).

Scientists M. Cejas *et al*. (2023) note that the "competency approach" is the orientation of educational activities on the development of mandatory competencies and predictable results of training in a specialty. This approach directs the educational sector to the formation of competencies in higher education students during their studies and is based on cross-cutting skills and competencies, on the ability to search for information, formulate and solve problems related to the professional development of a future specialist. In this context, the requirements for teaching aids acquire extremely significant emphasis. Priority is given to those that include communicative and situational tasks that require the involvement of students' experience, focus on future professional activity and encourage active thinking. A competency-based approach forms and develops the future specialists' ability to think creatively and critically, analyze, forecast, and successfully apply the acquired knowledge in practice in future professional activities. At the same time, the higher education institution forms the student's readiness to work in the specialty successfully under new conditions. Such an ideological concept orients educators to personality-oriented and activity-based learning models, in order to successfully ensure the quality of the educational process. This requires a research and teaching staff (a scientific and pedagogical worker) to shift the emphasis from the informational to the organizational and management level in educational activities (Kamenska, 2019; Rieckmann, 2019; Schöning & Mendel, 2023).

In the common worldview, the competence of a future specialist is understood as specially structured acquired knowledge, practical skills, abilities, and communications acquired during higher education obtaining. General and special (professional, subject) competences are used by an individual in various fields of professional activity for the implementation of certain tasks, and they also serve him/her in various situations when choosing a model of behavior. Without a doubt, all the above-mentioned scientific works and approaches of teacher-researchers are relevant. However, the ways of implementing a competency-based approach for quality training of future professional education specialists (transport, occupational safety and health) are not sufficiently disclosed by scientists and educators.

This challenge requires more research and practical initiatives to improve approaches to the application of the competency model. It is necessary to focus on the creation of comprehensive educational programs that cover interdisciplinary knowledge and emphasize the importance of practical application of theoretical knowledge for the formation of vocational competencies. Cooperation between educational institutions and the labor sector is also critically important to update educational courses to meet market needs. The research should also focus on analyzing the impact of a competency-based approach on the quality of students' training and their adaptation to the demands of professional life. It is important to develop clear criteria for evaluating the achievement of competencies, which will allow assessing the effectiveness of the educational process accurately. Active involvement of students in learning through project activities, case studies and other forms of active learning will increase their motivation and engagement. Teacher training is key to the successful implementation of a competency-based approach, as they must be able to adapt teaching and assessment methods to new educational requirements, including the use of information technology. Therefore, developing a deep understanding and effective application of the competency model can significantly increase the level of professional training, providing graduates with the necessary set of knowledge and skills for successful entry into professional life.

A key aspect for further development is not only the educational programs improving, but also ensuring the flexibility of the educational process so that it can adapt to the rapidly changing labor market conditions and technological innovations. This involves creating mechanisms for constantly updating the content of education, incorporating modern case studies on practice into the curriculum, and integrating international experience. The development of soft skills, which are essential for effective adaptation in any professional setting and include communication, critical thinking, creativity, and teamwork, should also receive a lot of attention. By considering these factors, educators may help students get more out of their education and become more marketable to employers. In order to overcome the difficulties involved in implementing a competency-based approach, it is also necessary to improve the digital technology and distant learning infrastructure, which will provide students greater flexibility and efficiency in their study time. Students may have access to an increased variety of learning resources and technologies with the further

integration of virtual laboratories and online platforms. Not to mention, engaging in scientific work and research projects can help pupils hone their analytical abilities and expand their capacity for creative thought. This will aid in the development of future professionals who can solve challenging professional challenges with fresh thoughts and solutions in addition to using previously learned information.

Particular focus needs to be placed on the advancement of individualized learning trajectories, which will allow students to shape their own educational path based on their interests, needs and career goals. This will contribute to a deeper involvement of students in the educational process and increase their motivation to study, as they will see a direct connection between the acquired knowledge and its application in their future professional activities. It is also necessary to intensify involvement in international educational programs and projects, which will allow students and teachers to exchange experience with colleagues from other countries, get acquainted with the latest educational practices and expand their professional horizons. International cooperation can also contribute to the implementation of joint research projects and the development of innovative educational materials. In addition, it is important to support graduates in the first years after completing their studies, in particular through mentoring programs that will help them successfully adapt to the work environment, develop professional competencies, and plan career growth. In summary, a comprehensive approach to education, which includes individualization of education, international cooperation, innovative technologies and support of graduates, can create a solid basis for the formation of highly qualified specialists, ready for the challenges of the modern labor market and capable of continuous professional development.

To increase the effectiveness of the implementation of a competency-based approach, educational institutions should also pay attention to the development of students' and teachers' digital literacy. This involves not only the mastery of basic IT-skills, but also the ability to critically evaluate information, understand the opportunities and risks of digital technologies, and use them for effective training and professional development. Involvement of students in scientific activities and innovative projects should become an integral part of the educational process. This will not only promote the development of critical thinking and research skills, but will also allow students to gain valuable experience in implementing real projects that will be recognized in the labor market. Another important aspect is to create conditions for the development of students' intercultural competence, which includes learning foreign languages, acquainting with the culture and educational systems of other countries. This is necessary for training future specialists to work in an international environment, expanding professional horizons and increasing their competitiveness in the global labor market. In addition, it is important to ensure the accessibility and quality of higher education for all categories of students, including persons with disabilities, providing an inclusive learning environment and equal opportunities for development and self-realization. All these measures will help create an educational system that meets modern requirements and challenges, prepares specialists who are able to work effectively in a rapidly changing world, adapt to new conditions and contribute to the development of society and the economy.

Formation of professional competences in the context of regulatory and legal support of the educational process

Scientific and technical progress and development of the social system does not stand still. Quality education ensures economic and social progress of society and social institutions. Accordingly, the state needs competitive specialists of the new formation, who are able to solve the tasks and current problems in the future professional activity. A graduate must be capable of professional activity and competent in the field according to their specialty. The strategy of HEI is to organize the educational process and create optimal learning conditions for students of higher education, to introduce innovative processes in the training of future specialists in order to form a highly educated, nationally conscious, creative, responsible, socially active personality and, as a final result, to obtain a comprehensively developed graduate, who will be a competitive qualified specialist of a new formation and in demand in the market of educational services. The process of training a competitive qualified professional (vocational) education specialist requires a comprehensive approach, on the basis of which the professional consciousness and general culture of the future specialists in professional education, capable of pedagogical activity, solving research and management tasks in the field of vocational education, continuous professional development, self-realization and career growth.

Regulatory and legal support for the organization of the educational process is a necessary element of the successful implementation of a competency-based approach for quality training of future specialists in professional education. For example, "Occupational Safety and Health in the Industry. Civil Protection" is a normative educational discipline that is included in the cycle of general training and is a mandatory educational component in accordance with the curriculum, despite the fact that in May 2014 the Cabinet of Ministers of Ukraine canceled the Order of the Ministry of Education and Science of Ukraine dated 21.10.2010 No. 969/922/216 (2010) regarding the mandatory study of the educational components "Occupational Safety and Health in the Industry" and "Civil Protection". However, in November of the same year, the Ministry of Education and Science of Ukraine was given an explanation regarding the importance and relevance of the teaching these academic disciplines and it was noted that the procedure for studying regulatory disciplines should be established by the HEIs in the legislative field in accordance with the standard programs of these disciplines ap-

proved in the established order (Sakun *et al.*, 2019). In view of this, the administration of HSUP, guided by Articles 4, 18, 30 of the Law of Ukraine "On Occupational Safety and Health" (1992), Articles 39, 41 of the Code of Civil Protection of Ukraine (2012), the Law of Ukraine "On Higher Education" (2014), the Law of Ukraine "On Education" (2017), the Standard of Higher Education of Ukraine (2020), etc., the educational component "Occupational Safety and Health in the Industry. Civil Protection" was introduced into the educational process to educational programs and is included in the mandatory cycle of general training for seekers of the second (master's) level of higher education.

The authors have identified the model of the organization of the educational process at HSUP, which is based on the Law of Ukraine "On Higher Education" (2014), state standards of higher education of Ukraine (2020), Regulations on the organization of the educational process at the Hryhorii Skovoroda University in Pereiaslav (2021) and other acts of Ukrainian legislation on the organization of educational activities (Table 1). The goals of the university's educational program are to foster students' intellectual and creative activity, to ensure that future professionals in the field of professional education can perceive, assimilate, transfer, and apply the knowledge, skills, and competencies they have acquired, and to provide a safe and healthy environment in which to work and learn. In compliance with the most recent education-related laws, the HSUP administration has established suitable work and learning environments.

Table 1. Model of the organization of the educational process at HSUP in the training of future specialists in professional education

<table>
<tr><td colspan="5">Forms of education</td></tr>
<tr><td colspan="5">Intramural form of education/(full-time education)
Correspondence form of education/(part-time of education)</td></tr>
<tr><td colspan="5">Volume of the Educational and Professional Program</td></tr>
<tr><td colspan="2">240 ECTS credits (first (bachelor's) level)</td><td colspan="3">90 ECTS credits (second (master's) level)</td></tr>
<tr><td colspan="5">Scientific and methodological support</td></tr>
<tr><td colspan="5">Regulatory and legal framework for the organization of the educational process</td></tr>
<tr><td colspan="2">Law of Ukraine "On Higher Education"</td><td colspan="3">Standard of Higher Education of Ukraine</td></tr>
<tr><td colspan="5">Regulations on the organization of the educational process at HSUP, regulatory documents, etc.</td></tr>
<tr><td colspan="5">Forms of organization of the educational process</td></tr>
<tr><td>Educational classes</td><td>Independent (self-study) work</td><td>Individual tasks</td><td>Practical training</td><td>Control</td></tr>
<tr><td>Types of educational activities</td><td rowspan="2">scientific activity, essays, e-learning in the Moodle system, non-formal education, etc.</td><td rowspan="2">essays, term papers, creative tasks, diploma projects or papers</td><td rowspan="2">practice in educational institutions, enterprises, institutions and organizations</td><td>Control measures</td></tr>
<tr><td>➥ lecture
➥ laboratory, practical, seminar
➥ consultations</td><td>➥ current control
➥ practical module
➥ module of independent (self-study) work</td></tr>
<tr><td colspan="5">Additional opportunities</td></tr>
<tr><td colspan="2">Dual form of education</td><td colspan="2">Academic mobility</td><td>Individual educational trajectory</td></tr>
<tr><td colspan="5">Accounting of knowledge of higher education students</td></tr>
<tr><td colspan="5">Final control
Theoretical module (computer testing)</td></tr>
<tr><td colspan="5">Learning outcomes</td></tr>
<tr><td colspan="5">Certification of seekers for higher education</td></tr>
<tr><td colspan="5">A competitive qualified specialist of a new formation and in demand in the market of educational services</td></tr>
</table>

Source: developed by the authors on the basis Law of Ukraine "On Higher Education", state standards of Higher Education of Ukraine, Regulations on the organization of the educational process at HSUP and other acts of Ukrainian legislation on the organization of educational activities

The purpose of studying the educational component "Occupational Safety and Health in the Industry. Civil Protection" is to prepare a competent specialist capable of carrying out professional activities in accordance with professional qualifications, taking into account the risk of man-made hazards and natural disasters; to implement measures to reduce losses and costs in the event of man-made and natural emergencies; to analyze, solve problems of an innovative nature and make effective decisions in crisis and emergency situations, considering the particulars of the future professional endeavors of those pursuing advanced education as well as the advancements made in science and technology.

The tasks of teaching the educational course "Occupational Safety and Health in the Industry. Civil Protection" are the following: to acquaint students of HEIs

with the legal, organizational foundations and principles of labor protection in the field of education, the features of the application and use of provisions, legislative acts and regulatory legal documents on labor protection and civil protection in their future professional activities; to lay a sufficient foundation for understanding emergency situations, their classification and causes; to provide students of higher education with theoretical knowledge and practical skills regarding the prevention of man-made hazards and natural disasters; to form a conscious and responsible attitude to safety issues in the field of education among future specialists of professional education; to provide the necessary knowledge to students of HEI and to prepare them for confident and correct practical actions in crisis and emergency situations; to teach master's degree students to methodically and competently develop engineering and technical measures in advance and implement them to reduce the risks of crisis and emergency situations, to be able to protect themselves, colleagues and students from the effects of crisis and emergency situations; to develop a scientifically based forecast of probable consequences in possible crisis and emergency situations; to acquaint seekers for higher education with methods and means of individual and collective protection. When studying this academic course, master's degree students consider and analyze the main laws, legislative and regulatory acts on occupational safety in the field of education; study the organizational and methodological basis of the occupational health and safety management system in educational institutions, problems of occupational safety, occupational hygiene and industrial sanitation in the field of education; learn about the government's emergency civil protection program for Ukraine, the prevention of man-made and natural disasters, the guidelines for behavior during shelling under martial law, and the fundamentals of maintaining Ukraine's cyber security. Future specialists also gain knowledge of occupational safety, the capacity to handle challenging specialized tasks and real-world issues in professional education and industrial occupational safety activities, and they are required to adhere to Ukrainian safety regulations and standards. The study of the educational component "Occupational Safety and Health in the Industry. Civil Protection" ensures that master's students master the competencies presented in the table (Table 2).

Table 2. Intended learning outcomes

Integral competency	Capacity to address issues of a novel and/or research nature and problems in professional education (including in emergency situations).
General competencies	**GC** 06. The capacity to behave mindfully and responsibly in society. **GC** 09. The capacity to assess, evaluate, and guarantee the level of work produced.
Special (professional) competencies	**SC** 01. Ability to apply and develop new approaches to solving problems of a research and/or innovative nature and problems of professional education. **SC** 04. Ability to analyze, predict, critically consider problems in professional education, make effective decisions on their solution. **SC** 09. Ability to analyze, evaluate and control hazards and harmful and dangerous production factors at the enterprise and in educational institutions for the purpose of safe functioning of production systems, to organize work in accordance with the requirements of life safety, occupational safety and health and the prevention of accidents at work, development measures to prevent them. **SC 10.** Ability to apply knowledge of legislation, state standards, industry regulations in the field of professional education and occupational safety and health.

Source: developed by the authors on the basis of the Standard of Higher Education of Ukraine of the second (master's) level, 015 "Professional education (by specialization) (18.11.2020, No. 1435)"

Integration of the competence approach and quality assurance of higher education

One way to put into practice a competency-based strategy for the high-quality training of future experts in professional education is to base the program's orientation and concentration on the Ukrainian Standard of Higher Education. The successful completion of the educational and professional program's accreditation examination and the educational program's certificate of accreditation from the National Agency for Higher Education Quality Assurance, which attests to compliance with the criteria by degrees of compliance, are additional factors influencing the quality assurance of future teacher training.

During the use of a competency-based approach, academic personnel that work in science and pedagogy integrate teaching and research, apply innovations in educational activities, and contribute to the achievement of the defined goals of the educational program to ensure quality education and successful realization of the individual's potential for professional activity. This approach ensures the effective acquisition of fundamental competencies, knowledge, cross-cutting skills, practical experience, abilities and the capability to apply them in professional activities by higher education students. The curriculum of the educational component "Occupational Safety and Health in the Industry. Civil Protection" is a regulatory document, created on the basis of the Standard of Higher Education of Ukraine, which defines the purpose and tasks of teaching the educational component, outlines the competencies that higher education students should master and ways to implement the competency approach (Table 3).

Table 3. Ways of implementing the competence approach on the example of studying the academic course "Occupational Safety and Health in the Industry. Civil Protection"

Working curriculum "Occupational Safety and Health in the Industry. Civil Protection"		
Content of the academic discipline		
The purpose, the tasks of teaching the discipline	Competences, competencies (integral competency, general competencies, special (professional) competencies)	Program learning outcomes
Forms of study of the discipline and volume		
Practical classes (22 hours)	Lecture classes (20 hours)	Independent (self-study) work (78 hours)
Forms and means of final control		
Oral survey of higher education students in practical classes	Performing individual, independent works	Form of the exam is computer testing
Evaluation criteria		
Current control		Final control
Practical module (practical classes)	I ndependent work module (modular environment, essay, independent work, scientific work, non-formal education, etc.)	Theoretical module (computer testing)
Result from 0-100 ECTS points		
0-50 practical module	0-30 theoretical module	0-20 module of independent work

Source: developed by the authors on the basis on the working curriculum of the educational discipline (educational component) "Occupational Safety and Health in the Industry. Civil Protection"

After studying this educational component, students as seekers for higher education at the second (master's) level must have basic professional competencies, implemented in the following learning outcomes that meet the requirements of the Standard of Higher Education of Ukraine of the second (master's) level, 015 "Professional education (by specialization)" (18.11.2020, No. 1435) (Standard of Higher Education of Ukraine. No. 1435, 2020):

➥ **Learning outcomes 05.** To choose the optimal strategy of teamwork, interpersonal communication and interaction when implementing complex projects in professional education and interdisciplinary projects, it is very important to integrate ethical, legal, social and economic considerations. This involves creating an inclusive environment that encourages diverse perspectives and collaborative problem solving. Effective communication is key, requiring clear, open channels for sharing ideas and feedback. Decision-making should be guided by ethical considerations, ensuring respect and fairness, while legal aspects concern compliance with relevant regulations. Social factors involve understanding the impact on communities and stakeholders, while economic aspects consider budget constraints and resource optimization. Balancing these elements contributes to a holistic approach that improves project outcomes and participant engagement.

➥ **Learning outcomes 12.** To achieve this, it is important to constantly update and apply best practices in the management of occupational safety and health and civil protection. This involves not only implementing the latest safety technologies and methodologies, but also integrating international best practices into the local context. Regular training and familiarization of employees with the latest safety regulations and technologies is crucial. In addition, creating a safety culture that prioritizes employee well-being as a fundamental component of professional success is considered to be vital. This culture should encourage proactive risk assessment, prompt reporting and elimination of potential hazards, and a collective commitment to maintaining a safe work environment. Moreover, using data analytics to predict safety measures can significantly reduce accidents and improve working conditions. Achieving program learning outcomes is ensured through the implementation of innovative teaching methods (interactive technologies (case method, brainstorming, business/role play), blended learning method, project method), which is consistent with contemporary developments trends of the specialty in the labor market. When implementing a competency-based approach for quality training of the future professional education specialist, the scientific and methodological support of the educational process plays an important role (Table 4).

Table 4. Scientific and methodical support of the educational process, ensuring the achievement of defined goals and program learning outcomes

Standards of Higher Education	Standard of Higher Education of Ukraine of the second (master's) level, 015 "Professional education (by specialization)" (18.11.2020 p. № 1435)	*Educational program "Professional education (by specialization)" of the second (master's) level*
	Standard "Professional Education Teacher" No. 38-OD dated 29.12.2022	

Table 4. Continued

Curriculum	Working curriculum
	Syllabus
Methodical support	Textbooks, manuals, educational and methodological guides, collections of scientific works
	Instructional and methodical materials for practical classes, individual semester assignments for practical classes, for independent work of higher education students in the academic discipline; test tasks for current and final control
	Regulatory documents on labor protection and civil protection
	Primary source and illustrative materials, etc.

Source: developed by the authors on the basis of the Law of Ukraine "On Higher Education", state standards of higher education, Regulations on the organization of the educational process at HSUP and other regulatory documents of HSUP

The teacher, using various forms and methods of training, forms the professional competency of future specialists, influences the development of their thinking, memory, attention, logic, intuition, creativity, sets them up for self-development, self-improvement and individualization, so that in the future they can skillfully, efficiently, concisely and clearly express their own position and opinion in the new conditions of future professional activity. The means of diagnosing the program learning outcomes of the educational component "Occupational Safety and Health in the Industry. Civil Protection" include: final testing (exam) in the Moodle system; analytical reports, abstracts, essays; student presentations and speeches at scientific events, publication of scientific papers; independent work; work in a modular environment. The primary focus should be on higher education students' mastery of professional competencies and the intensification of their cognitive and educational activities. This entails the adoption of certain pedagogical conditions of study that use a competency-based approach for the qualitative training of future professional education specialists (transport, occupational safety and health):

- adaptation of higher education students to the educational process in the conditions of martial law in Ukraine (pedagogical consulting, coaching, tutoring, etc.);
- organization of the educational process using conceptual approaches: competency-based, systemic, personality-oriented, activity-based, student-centered;
- use of interdisciplinary connections in the process of formation the professional competence of future professional education specialists (transport, occupational safety and health);
- motivation and stimulation of masters to master professional competency;
- application of modern pedagogical teaching technologies (innovative, ICT, modeling, individualization, problem-based learning, project method, etc.);
- bringing the educational process closer to future professional activities;
- selection and application of various methods and forms of education: surveys, search work with scientific and methodical literature; analysis of basic concepts by topic; problem situations; heuristic conversation; discussion; development of an individual program; brainstorming; group work; modeling and designing professional activities; project development; preparation of recommendations, methodological materials, etc.;
- creation of favorable learning conditions for self-development and self-improvement of masters.

Undoubtedly, in the professional training of future professional education teachers, the main goal is to form their competencies based on the academic and professional program and educational and qualification characteristics to ensure the quality of the training of students of higher education and to meet the demand on the labor market. The implementation of a competency-based approach in HEIs has advantages and involves the training of a comprehensively developed personality who will resolve challenging specialized assignments and real-world issues in professional education (transport, occupational safety and health) and in industrial activities. This will contribute to the continuous professional development, growth, self-realization and career growth of specialists of the new formation in today's conditions (Table 5).

Table 5. Advantages of implementing a competency-based approach to training future specialists in professional education

Production, enterprise, educational institutions	Higher education institutions	Seekers for higher education (students)
Providing the labor market with highly qualified specialists of a new formation	Providing students with fundamental theoretical and practical training	Acquiring competencies for further employment and professional growth
Development of labor resources	Production of highly qualified, competitive specialists of a new formation	Capacity to deal with intricate specialized assignments and real-world issues in professional education (by specialization) and industrial activity
Development of the specialty in the labor market		Professional activity, self-realization, career growth

Source: developed by the authors on the basis on their own research

Thanks to the analysis of the results of the examination session, it was established that the integration of a competency-based methodology in the instruction of future professional education specialists indicates a qualitative rate of success of higher education students, which is within 71-80%, and an absolute success rate of 100%. One of the education sector's primary responsibilities, which must be carried out and followed in order to successfully implement the requirements of the state policy in the field of occupational safety and health, is to increase the level of all preventive work to prevent accidents and occupational diseases at the very beginning of professional growth and career development of a future professional education specialists (transport, occupational safety and health).

CONCLUSIONS

The article analyzes the experience of Ukrainian and foreign scientists on this issue. It has been found that by focusing on professional competencies, HEIs can contribute to the building of educational spaces that emphasize practical skills, critical thinking and problem-solving skills, ensuring that students are not only knowledgeable but also able to apply their knowledge in a variety of situations. The study showed that a competency-based approach, coordinated with a well-organized model of the educational process in HEIs and supported by relevant regulatory documents, is of crucial importance for the effective training of future specialists. This model serves as a fundamental basis for the development of professional competencies of higher education seekers in accordance with their educational and professional programs and qualification standards. This approach is an innovative contribution to increasing the level of training of coming experts in the area of professional education, ensuring thorough implementation of a competency-based approach. It emphasizes the importance of integrating theoretical knowledge with practical skills adapted to the specific requirements of the industry, which facilitates a smooth transition of graduates into their professional roles. This strategy not only raises the standards of professional education, but also responds to the changing needs of today's workforce, ensuring that graduates are well prepared and adapted to the dynamic challenges of their profession.

The study of the normative educational component "Occupational Safety and Health in the Industry. Civil Protection" contributes to the formation of professional competences. After studying the academic course, higher education students are able to set and solve professional tasks in the future professional activity according to the program learning outcomes. Taking into account the updating of the system of professional education in compliance with the modern demand in the labor market, the peculiarities of the organization of the educational process and the requirements of occupational safety and health and civil protection, the authors have identified pedagogical conditions for the implementation of quality training of future professional education specialists. The application of conceptual approaches (competency-based, systemic, personality-oriented, activity-based, student-centered, etc.) to the educational process is based on the Regulations on the organization of the educational process at HSUP (Regulations on the organization of the educational process at the Hryhorii Skovoroda University in Pereiaslav, 2021) and existing HSUP regulatory documents. A comprehensive approach and the quality of educational services in the educational process have a positive effect on the learning outcomes, and provide prospects for future specialists to be competitive in the labor market. The research that was done does not address every facet of the issue that was raised. Prospects for further research in this direction will be aimed at studying the impact of innovative educational technologies on the development of competencies in higher education.

ACKNOWLEDGEMENTS

We express our sincere gratitude to the library of Hryhorii Skovoroda University in Pereiaslav for the excellent technical assistance that made this research and its presentation possible.

CONFLICT OF INTERESTS

There is none.

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Шляхи реалізації компетентнісного підходу для якісної підготовки майбутніх фахівців професійної освіти (транспорт, охорона праці)

Анотація. Проблема якісної підготовки майбутніх фахівців професійної освіти шляхом реалізації компетентнісного підходу при вивченні здобувачами вищої освіти освітнього компоненту «Охорона праці в галузі. Цивільний захист» залишається мало дослідженою та набуває особливої актуальності, так як компетентнісний підхід передбачає особливу організацію освітнього процесу в закладі вищої освіти. Відповідно, метою дослідження було розкрити особливості та шляхи реалізації компетентнісного підходу до якісної підготовки майбутніх фахівців професійної освіти (транспорт, охорона праці) на прикладі вивчення навчальної дисципліни «Охорона праці в галузі. Цивільний захист». Для реалізації поставленої мети застосовано взаємодоповнюючі методи дослідження: теоретичний аналіз, синтез та узагальнення наукових видань, навчально-методичної, науково-педагогічної літератури та нормативної документації, для уточнення сутності ключових понять, виявлення стану проблеми дослідження, моделювання організації освітнього процесу та обґрунтування педагогічних умов навчання; аналіз освітніх програм, педагогічної діяльності викладачів закладів вищої освіти задля уточнення процесуальних особливостей реалізації компетентнісного підходу. Авторами виділено модель організації освітнього процесу при реалізації компетентнісного підходу до підготовки майбутніх фахівців професійної освіти в умовах Університету Григорія Сковороди в Переяславі. Встановлено, що такий перехід дає змогу розвивати основні навички, які мають вирішальне значення для застосування знань у реальному світі, акцентуючи увагу на вирішенні проблем, критичному мисленні та здатності адаптуватися до мінливих ситуацій. Визначено, що компетентнісний підхід сприяє створенню навчального середовища, в якому студенти активно залучені до навчання, заохочуючи їх брати на себе відповідальність за свій навчальний процес. Крім того, освіта, заснована на компетентностях, тісно пов'язана з потребами ринку праці, гарантуючи, що випускники володіють відповідними навичками і знаннями, яких вимагають роботодавці, тим самим підвищуючи їхню здатність до працевлаштування. Використання результатів цього дослідження та впровадження компетентнісного підходу в професійній освіті може не лише покращити навчальний процес, але й зробить значний внесок у підготовку всебічно розвинених, кваліфікованих фахівців, готових до вирішення проблем у своїх галузях

Ключові слова: якість освітніх послуг; компетентності; результати навчання; освітня програма; освітня галузь; професійна безпека

Vol. 2. No. 2. 2023 Scientia et societus
Received: 26.07.2023.
Revised: 29.10.2023.
Accepted: 12.12.2023.
Journal homepage: https://ses.journal.in.ua/index.php/ses/issue/view/4

UDC 378.147: 355 *DOI: 10.69587/ss/2.2023.42*

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Formation of communicative culture of future service sector specialists: theoretical analysis and practical perspectives

Abstract. This article highlights the importance of studying the communicative culture of future service sector specialists from theoretical and practical perspectives. The main objective of the work was to analyze and summarize the essence of communicative culture in the context of professional development of future professionals, which ensures their social activity and contributes to the formation of positive communicative skills and qualities. Analytical and comparative methods of studying communicative culture are used in the article, as well as an analysis of modern approaches to forming communicative competence in future service professionals. It is emphasized that the development of the communicative culture of future service professionals is inextricably linked to their professional and personal growth, which is manifested in a creative approach to mastering the techniques and methods of effective communication. It is noted that at the same time, communication culture plays an important role in shaping the social activity of a specialist, determines the norms of behavior and teaches to use appropriate means of communication. It is proved that thanks to the knowledge and ability to use the adaptive capabilities of communication culture, specialists can successfully establish communication with colleagues and clients, as well as build their careers. Additionally, the article includes an analysis of the professional qualities that a tourism professional should possess. The research results demonstrated that studying communicative culture has great potential for improving the quality of service and increasing professional competence. The practical significance of the work lies in the possibility of using its results in the service sector of foreign language professional training of future service professionals to improve communicative skills and increase the efficiency of communication in professional activities

Keywords: professional activity; motivation; modeling; verbal and non-verbal means of communication; communicative culture; communication tools

Suggested Citation:
Tanana, S., & Soga, L. (2023). Formation of communicative culture of future service sector specialists: theoretical analysis and practical perspectives. *Scientia et societus*, 2(2), 42-52. doi: 10.69587/ss/2.2023.42.

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INTRODUCTION

The significance of this research lies in addressing contemporary social demands for prospective service sector specialists who possess advanced language proficiency. Consequently, there is a need for the revitalization of higher education processes and the identification of pedagogical conditions that can enhance the successful development of future service sector professionals' aptitude for dialogue communication in their professional endeavors. This, in turn, is expected to elevate the standards of professional language education, meeting the evolving requirements of the field.

Globalization and the integration of Ukraine, along with global organizations and the European community, play a crucial role in the swift amplification of the significance of quality education for the continued advancement of society. In line with this, there is a pressing need for intensive reforms. Addressing this challenge involves enhancing the quality of the process in preparing future specialists, necessitating the effective implementation of a competence-based approach (Hritchenko *et al.*, 2023). The effectiveness of preparing future specialists in the service sector is closely linked to the contemporary content of education. This involves not only acquiring a set of competencies but also ensuring continuous improvement through the refinement of mechanisms and their practical application in everyday scenarios (Vorstman *et al.,* 2020). In the context of modern education, it is essential to provide a comprehensive orientation for students to grasp a system of competencies. This goes beyond theoretical knowledge and emphasizes the practical aspects of applying these competencies in real-world situations. The curriculum should be designed to facilitate hands-on learning experiences that align with the demands of the service sector. Furthermore, ensuring permanent updating is crucial for staying relevant in a rapidly evolving professional landscape. This involves ongoing improvements in the mechanisms of education delivery, incorporating the latest industry trends, and adapting teaching methodologies to meet the dynamic needs of the service sector (Ushakov *et al.*, 2021).

To enhance the quality of professional preparation, fostering an environment that encourages active engagement, critical thinking, and practical application of acquired competencies is imperative. It goes beyond traditional teaching methods, incorporating interactive learning, case studies, and collaborative projects to simulate real-world service scenarios. In conclusion, the quality of preparing future specialists in the service sector is intricately tied to a forward-looking and dynamic approach to education (Melnychuk *et al.,* 2019). This approach should prioritize practical application, continuous improvement, and adaptability to ensure that graduates are well-equipped to navigate the challenges of the ever-changing service industry. In the Common European framework of reference: learning, teaching and assessment (n.d.), Common European principles for teacher competences and qualification (n.d.) and other public documents state that communication with diverse populations, accessible and well-promoted opportunities for learning European languages, including relevant subject vocabulary, should be integrated into both initial teacher education and in-service teacher development initiatives (Bruges Communique on Enhanced European Cooperation in Vocational Education and Training for the period 2011-2020 years n.d.). Ukraine actively pursues alignment with the European higher education space through the Bologna Process. However, to fully achieve this goal, developing students' professional language skills remains a crucial area for development (Burak, 2020a).

In the pursuit of aligning with the European dimension of higher education through the implementation of Bologna Declaration measures, Ukraine recognizes the need for continued efforts to address specific challenges associated with the objectives of the Bologna Process. Among these challenges, the development of learners' professional language competence stands out as a crucial aspect that requires comprehensive attention and strategic solutions (Ashwin, 2022). Expanding on this point, it is evident that fostering professional language competence goes beyond mere language proficiency. It involves cultivating a nuanced understanding of language within the context of specific academic disciplines and professional fields. This not only includes linguistic aspects but also extends to grasping the industry-specific terminology, communication norms, and contextual nuances that define effective professional communication.

To effectively address this challenge, educational institutions and policymakers should consider implementing innovative pedagogical approaches. Integrating real-world applications, industry-relevant case studies, and interactive learning methodologies can significantly contribute to enhancing learners' language skills in a professional context (Smolentseva, 2023). Moreover, partnerships between academia and industry can provide valuable insights into the practical language requirements of various professions, ensuring that educational programs align with the evolving needs of the job market. Furthermore, investing in language learning resources, modern technology, and creating an immersive language-learning environment can contribute to a more dynamic and effective learning experience (Goloborodko *et al.*, 2020). This could include language labs, online resources, and collaborative projects that simulate real-world scenarios, allowing students to apply their language skills in practical situations. While Ukraine commits to the European dimension of higher education, the ongoing focus should be on developing learners' professional language competence. This requires a multifaceted approach that encompasses linguistic proficiency, industry-specific understanding, and practical application, ensuring that graduates are well-prepared for the linguistic demands of their chosen professions in the European higher education landscape (Brugues comminique on enchanced European..., n.d.)

The cornerstone of future service professionals' success lies in their ability to navigate the intricacies of

professional communication culture. This culture establishes a framework for goal-oriented communication and fosters seamless interaction between these professionals and their clients as they navigate diverse tasks within their field (Khomenko *et al.*, 2021). Mastering the art of dialogue communication is critical across a broad spectrum of professions, including those in psychology, education, and science. Its versatility and profound impact make it essential to cultivate this skill as part of professional development, particularly the fundamental ability of engaging in effective dialogue. This communication form is driven by the necessity to address communicative challenges arising in professional interaction. Successfully navigating these challenges ultimately aids future service professionals in fulfilling their core professional tasks. Professional self-fulfillment should be viewed as a never-ending journey of learning and development. This includes continuously honing your skills and striving for excellence in your professional field.

The purpose of the study is to examine the communicative culture of future service sector specialists and its impact on their professional development, aiming to enhance their social activity and improve their communicative skills. The objectives of the study include analyzing the essence of communicative culture, exploring its role in professional and personal growth, examining its influence on social activity and behavior norms, and assessing its practical implications for career advancement and successful communication. In order to achieve a high level of objectivity and completeness of the analysis, a comprehensive methodological approach was applied, covering a wide range of research methods. The initial stage was an in-depth study of the relevant literature in key disciplines such as sociology, psychology, pedagogy and methodology, which allowed us to form the theoretical basis of the study. For this purpose, the analytical method was used, which included a critical review of scientific sources, articles, monographs and other publications related to the subject of the study. Further, in order to systematise the knowledge gained and identify key trends in the use of modern technologies in the selected areas, the method of generalisation was applied. This method made it possible to identify effective practices and approaches, as well as to identify potential opportunities and challenges arising in the context of the introduction of new technologies. An important part of the research was the logical and structural analysis, which was carried out to establish links and dependencies between the various elements of the research topic. This included the development of logical models, diagrams that reflected the structure of the phenomenon under study, and helped to identify internal and external factors that influence the process of using technology in education, social sphere and other contexts under study.

Development of communication culture and professional skills in the service sector

The communicative culture of service sector specialists is intricately structured, comprising four essential components: person-reflexive, epistemological-cognitive, operational-technological, and professional-adaptive. Each of these components plays a vital role in shaping the communicative abilities of specialists within the service sector. These components undergo a personality-oriented transformation during the course of studying in the specialty. The emphasis shifts towards the individual learner, addressing their unique needs and cultivating a communicative skill set that aligns with the demands of the service sector. This person-oriented approach ensures that specialists are not only well-versed in theoretical aspects but are also equipped with practical and context-specific communication abilities. The training approach goes beyond theoretical knowledge; it is designed to solve real-world problems encountered by service sector specialists. Whether it's addressing customer concerns, collaborating with team members, or utilizing technology effectively, the training curriculum focuses on developing competencies that directly contribute to problem-solving in professional settings (Lee & Moon, 2020). The structure of communicative culture for service sector specialists is dynamic, evolving, and tailored to the individual. The person-oriented focus during vocational training ensures that specialists not only grasp theoretical concepts but also acquire the practical skills necessary for success in the ever-changing service industry.

The current status of the formation of communicative culture among service sector specialists at vocational establishment falls short of meeting the societal demands for skilled workers in the service sector. There is a pressing need for the development of a comprehensive system for cultivating communicative culture among service sector specialists, accompanied by the implementation of a set of measures aimed at enhancing this crucial aspect of vocational training. To address this challenge, it is imperative to reevaluate and revise the existing curriculum to incorporate more effective communicative training methodologies (Pankiv *et al.*, 2023). This may involve integrating practical scenarios and real-life simulations into the training process, allowing students to apply their communication skills in authentic service situations. Moreover, fostering partnerships between vocational schools and businesses in the service sector can contribute to a more tailored and industry-relevant approach to communicative culture development (Elliott, 2020). Collaborative initiatives, such as internships, workshops, and guest lectures by industry professionals, can provide students with practical insights and hands-on experience, bridging the gap between theoretical knowledge and real-world application. Additionally, the integration of modern communication technologies and tools into the educational process can enhance the proficiency of service sector specialists. Training programs that incorporate digital communication platforms, customer relationship management systems, and other relevant technologies can better prepare students for the dynamic and technology-driven nature of contemporary service industries (Kovalenko, 2019). The enhancement of communicative culture among service sector specialists requires a

multifaceted approach that includes curriculum redesign, industry collaboration, practical training, and the integration of modern technologies. By addressing these aspects, vocational schools can better fulfill the evolving needs of the service sector and produce graduates who are adept communicators in their professional roles (Ibrahim, 2021).

Communicative culture, in the context of this research, refers to the proficiency and effectiveness with which individuals within the service sector can engage in meaningful and productive communication. This extends beyond mere linguistic competence to encompass the ability to navigate diverse communication scenarios, understand contextual nuances, and engage in collaborative problem-solving. The pedagogical conditions integral to the cultivation of communicative culture involve creating an educational environment that prioritizes interactive learning, practical applications, and real-world simulations (Plakhotnik *et al.*, 2022). Incorporating role-playing exercises, case studies, and industry-specific projects can provide students with the hands-on experience needed to develop their communicative skills in a professional context. Moreover, the role of educators in modeling effective communication, providing constructive feedback, and facilitating discussions that mimic professional interactions is crucial. Collaborations with industry experts and exposure to real-world communication challenges can further enhance the students' preparedness for the complexities of service sector professions (Baez *et al.*, 2020.) Elucidating the concept of communicative culture and emphasizing the pedagogical conditions for its development among future service sector professionals is pivotal. This involves not only refining linguistic skills but also instilling the ability to communicate effectively, adapt to diverse contexts, and collaborate seamlessly in their respective professional spheres. Such an approach ensures that graduates are well-equipped to excel in the dynamic and communication-intensive service sector.

Grasping the idea of educational prerequisites is essential for shaping a learning atmosphere that encourages the growth of communicative skills among aspiring professionals in the service industry. By conducting a theoretical examination of this matter, a framework of educational conditions can be developed in universities and colleges to aid in the career advancement of these experts. This system encompasses the integration of contemporary educational technologies, such as interactive, informational, project-based, and problem-oriented approaches, into the training process for future service sector specialists (Ye *et al.,* 2023). The utilization of diverse teaching methods, acknowledgment of students' academic achievements, and educators' readiness to implement competency-focused, student-oriented approaches are integral components of this system. Comprehensive motivation of students' educational activities is paramount, especially in the study of specialized and elective disciplines. This involves creating an environment that fosters enthusiasm for learning and encourages active student engagement. Moreover, teachers are pivotal in evaluating the progression of psychological components of professional skill in their students. During their academic pursuits in higher education, instructors play an active role in nurturing the key professional attributes in upcoming specialists in the service sector. This is achieved through educational activities tailored to the individuality of each future specialist and the cultivation of specific personal and professional qualities pertinent to the field of tourism. In essence, the pedagogical conditions outlined above are pivotal in shaping a well-rounded and competent cohort of future service sector specialists. They not only focus on the academic aspect but also emphasize the importance of psychological development and the cultivation of qualities relevant to the dynamic and multifaceted field of service (Povidaychyk *et al.*, 2020).

From a psychological standpoint, a condition is defined as a set of phenomena from the external or internal environment that likely impact the development of a specific mental phenomenon, mediated by the activities of an individual or a group of people (Berezovska & Rusyn, 2019). When considering the readiness of future tourism managers, it is crucial to take into account the unique characteristics of the tourism industry. The first unique thing about how service sector specialists develop is that students can choose their specific area of expertise (definitive self-determination). A key feature of the professional development process for future service specialists is understanding their chosen field's professional profile. This profile functions as a symbolic blueprint, delineating the expected norms and requirements (including both psychological characteristics and essential skills) for individuals within that specific profession. These qualities might encompass leadership, efficiency, independence, self-confidence, stress resistance, responsibility, tolerance, reflexivity, and active engagement in the tourism business. Additionally, awareness of one's own achievements and motivation are integral aspects. In essence, the professional journey of future tourism managers involves not only acquiring knowledge and skills but also embracing a set of psychological attributes vital for success in the dynamic field of tourism. This holistic approach ensures that future professionals are well-equipped to navigate the multifaceted challenges and demands of the tourism industry (Kim *et al.*, 2022).

The second distinctive feature in the professional development of service sector professionals involves acquiring the specialized knowledge and skills essential for professional success in tourism. This encompasses mastering techniques such as public speaking, conducting telephone conversations (especially in client interactions), and developing personal efficiency. Within this framework, personal efficacy refers to the mastery of self-presentation methods, handling oneself under pressure, adept time organization, mastering communication methods, and the skill to counter manipulative behaviors, persuasive skills, mastery of the language of business communication, and proficiency in using IT technologies (Sa, 2023a), among other relevant competencies. In a broader context, these acquired skills not only contribute to the professional growth of service

sector professionals in the tourism industry but also enhance their overall adaptability and readiness to address the diverse challenges posed by their roles. This multifaceted skill set positions them to excel in various aspects of their professional journey within the dynamic and evolving field of tourism (Bahno *et al*., 2021).

The third distinctive aspect in the professional development of service sector professionals involves students' acquisition of professional knowledge. This encompasses foundational knowledge in psychology, including social and cognitive psychology, as well as personality psychology. Additionally, students delve into the basics of sales techniques and gain insights into the characteristics of the tourism business. This includes understanding the presentation of tourism products, recognizing patterns in the development of tourism businesses, and acquiring foreign language skills. Moreover, students explore the legal and economic aspects relevant to the tourism business, contributing to a well-rounded and comprehensive understanding of the field (Absatova *et al*., 2021). This diversified knowledge base not only equips service sector professionals with a solid foundation in psychological principles and sales techniques but also ensures they possess the essential insights into the intricacies of the tourism industry. As a result, they are better prepared to navigate the multifaceted challenges and responsibilities inherent in their roles, fostering a holistic approach to their professional development within the dynamic realm of tourism.

The authors A. Chagovets *et al*. (2020) establish, through a theoretical exploration of the examined issue, a set of educational prerequisites for the professional growth of upcoming specialists in the service sector within higher education settings, which encompasses:

- integration of modern educational technologies (interactive, informational, project-based, problem-solving, etc.) within the learning process. Implementation of contemporary teaching methods aligned with competence and student-centered approaches. Effective assessment of student learning outcomes to gauge their academic achievements. Evaluation of teachers' preparedness to effectively utilize competence and student-centered methods;
- implementing comprehensive strategies to ignite and sustain student motivation in both specialized and elective disciplines within their studies;
- in higher education, it's crucial for instructors to take into account the present developmental stage of future service professionals in terms of the psychological components of their professional expertise. This entails nurturing key professional traits that are pertinent to the service industry. Such a tailored approach, known as personality-oriented educational activity, is designed to develop both the unique personal qualities and the particular skills required for careers in service-oriented fields.

Expanding on the research by O.V. Kovalenko *et al.* (2021), this study explores the educational prerequisites that are both necessary and sufficient for future tourism managers to thoroughly and effectively learn professional dialogue communication. The goal is to pinpoint a range of both external and internal elements that aid in developing their preparedness to participate in such dialogues.

Approach to the development of dialogue communication and linguistic personality in the education of future service professionals

This study has identified key educational factors crucial for cultivating dialogue communication readiness in future service professionals. These factors emphasize specific elements, with a primary focus on fostering a strong learning motivation in these students to actively engage in the acquisition of dialogue communication skills. It is essential that students perceive the significance and relevance of this educational process, thereby fostering their enthusiasm and internal readiness to delve into communication skills (Hofmeister & Pilz, 2020). Integration of various activities plays a pivotal role, encompassing speech-related exercises, communicative tasks, and specific training relevant to the tourism sector. This multifaceted approach ensures a comprehensive understanding of the diverse aspects of dialogic communication, preparing future specialists for the intricacies of real-world scenarios (Sabatovska *et al*., 2019). Furthermore, modeling authentic professional communicative situations within the educational framework is essential. This involves replicating genuine scenarios that future service sector professionals might encounter, providing them with practical experience and preparing them for the challenges of effective communication in their future roles. Creating a conducive educational environment is equally crucial for nurturing the linguistic personality of future tourism managers. This environment should encourage linguistic development, facilitate open communication, and promote a culture of effective dialogue. Such an atmosphere contributes significantly to the holistic development of communication skills required in the dynamic and diverse service sector (Rabiah, 2020).

The core condition underscored involves nurturing the enthusiasm of aspiring professionals in the service sector to engage deeply with the study of dialogic communication. In the realm of professional advancement, motivation emerges as the key driving force, propelled by the internal tensions between evolving demands and the paths open for their realization. This motivation comprehensively affects the individual, influencing different dimensions like their focus, behavior, emotional responses, personality, and competencies. Essentially, motivation serves as the impetus behind an individual's behavior and plays a pervasive role in shaping their professional trajectory. In the realm of service sector specialists, motivation becomes a dynamic force influencing their approach to studying dialogic communication (Kachmarchyk *et al.,* 2019). The evolving needs of the service sector, coupled with the opportunities for skill development, create a dynamic interplay that propels individuals toward a deeper understanding of effective communication. This motivation becomes the catalyst for their engagement with dialogic communication, instilling

a sense of purpose and commitment to honing these essential skills. Moreover, recognizing the diverse components through which motivation operates underscores its significance in influencing not only the cognitive aspects of learning but also emotional and behavioral dimensions. This holistic approach to motivation ensures that future service sector specialists not only acquire theoretical knowledge but also internalize and apply effective communication skills in real-world contexts (Burak, 2020b).

In summary, motivation stands as a pivotal force shaping the journey of future service sector specialists into the realm of dialogic communication. Understanding its multifaceted impact provides educators and professionals with insights into cultivating a learning environment that nurtures not only knowledge acquisition but also the practical application of communication skills within the service sector landscape. The development of motivation is a complex process influenced by both external and internal factors. External conditions, such as the content of training, teaching methodologies, logistical aspects, and the psychological climate within a group, play a significant role. These external factors shape the overall learning environment and contribute to the motivation of individuals. Internally, motivation is influenced by an individual's readiness for activity, their ability to engage in different types of interactions and communication with others, and their active participation in various activities and communication channels. Additionally, the immediacy of individual qualities further contributes to the internal conditions that shape motivation (Telychko & Zavydovska, 2020).

The significance of these internal and external factors cannot be overstated. Readiness for activity implies a proactive approach and willingness to participate actively in the learning process. Effective interaction and communication skills are crucial in fostering a positive learning environment, and the immediacy of individual qualities emphasizes the unique contributions of each learner. Furthermore, the role of educators in creating a supportive and encouraging atmosphere cannot be overlooked. Teachers, through their teaching methods and the psychological climate they establish, can have a profound impact on students' motivation. The interplay between external and internal conditions, along with the active role of educators, shapes the formation of motivation in the learning process. The collaborative efforts of both educators and learners contribute to a motivational environment that enhances the overall educational experience. To foster the interest of prospective experts in studying dialogic communication, several factors have been taken into consideration. These factors encompass the appeal and freshness of the educational materials, the instructor's personality, and the methodical techniques employed. Additionally, we've addressed students' recognition of the practical relevance of subject knowledge and effective study methods (Khmelnytska *et al.*, 2021). The teacher plays a crucial role in shaping the motivation of future specialists in the service sector, as motivation does not emerge randomly, and its effective support reflects the teacher's active engagement and skills. It's vital to identify resources that capture the attention of future professionals and enable them to utilize the knowledge in professional and daily interactions, encompassing communication strategies, tactics, and methods of non-verbal communication. The choice of instructional content was directed by an approach focused on the needs of the professionals. Fostering the future motivation of service sector specialists involves employing methods such as business games and project-based learning. These approaches enhance cognitive interest, facilitate diverse forms of interaction, apply knowledge in practical scenarios, promote collaboration, demonstrate mutual respect, encourage tolerance, and emphasize attentive listening to others' opinions.

In summary, motivation emerges as a critical component in both educational dynamics and the cultivation of dialogic communication capabilities. The pursuit of communicative activities satisfies an individual's fundamental need for interaction, targeting the achievement of successful communication within professional contexts. Furthermore, the second key condition identified entails merging diverse forms of activities for prospective tourism managers, incorporating training in speech and communicative skills, along with knowledge in the field of tourism. This amalgamation indicates a cohesive fusion of activities, including verbal expression and learning processes, as well as proficiency in communication and tourism insights. These activities complement, reinforce, and interweave with one another, thereby creating the conducive conditions for fostering a readiness for engaging in dialogue communication. A speech training activity involves the creation of simulated, artificial situations designed to prepare students for real and natural communication. This is often referred to as "role-playing" or "simulated communication". Its purpose is to serve as a "bridge" between educational and authentic communication, fostering the ability to articulate messages and encouraging independent speech activity. Implementing speech training activities within learning and communicative contexts proves to be an effective means of developing reasoning skills and competencies (Sá, 2023b).

Communication transcends mere information sharing by being a purpose-driven process that entails interactive exchanges of information, notably through feedback. This essential human behavior is crucial for starting and growing interpersonal connections. As pointed out by I.V. Gluzman *et al.* (2021), the effectiveness of future service professionals is significantly dependent on their ability to communicate. These communication skills include the capacity to engage effectively with others, informed by one's educational experiences and characterized by humanistic attributes such as friendliness, openness, discretion, empathy, and the ability to mediate. Furthermore, the communication competencies of coordinators are vital for ensuring effective interaction within the service industry. In the tourism sector, the essence of tourism activity is defined as the delivery of services to users engaging with tourism products, aiming to fulfill the objectives of professional

tourism management. Embedding this activity into the educational curriculum involves several strategies. Firstly, students are introduced to the specialized terminology prevalent in the tourism industry. Secondly, educational simulations are employed to replicate the challenges and situations tourism managers frequently encounter. Lastly, educational sessions are conducted within environments designed to mirror the operational context of a real-world tourism enterprise. The amalgamation of speech and learning activities, communication, and tourism necessitates the application of insights from linguistic and professional domains, particularly in tourism. This integration ensures effective communicative skills among professionals (Radojevic *et al.,* 2019). Consequently, students' verbal proficiency is enhanced by incorporating knowledge from the field of tourism, fostering the development of communication skills tailored for dialogic exchanges. Another essential factor in cultivating the preparedness for dialogic communication in prospective tourism managers involves the emulation of authentic professional communicative scenarios within the educational framework (Woodring & Feeney, 2023).

The essential characteristics of communicative situations in professional communication encompass the following aspects:

- artificially creating situations that closely resemble the real dynamics of professional communication;
- establishing role positions for communication participants, fostering tolerant relationships, and cultivating a positive group atmosphere;
- incorporating professionally oriented content (tourism) into communication activities;
- adhering to speech etiquette and communication manners appropriate to the given communicative situation (Ogui, 2019).

The goal of simulating professional communicative scenarios is twofold: to enhance the comprehension of future tourism managers regarding the pivotal importance of dialogue communication in their career progression; to furnish them with the vital competencies required for the proficient performance of their professional responsibilities. The fourth key aspect involves the creation of a favorable educational environment that will stimulate the development of the language personality of future tourism managers. The environment plays a pivotal role in shaping an individual's personality, as it influences perception, responses, interactions, and contacts (Steblyuk, 2020). By establishing a favorable educational environment, the effective professional development of linguistic personality traits in future experts can be facilitated. The educational framework establishes a series of conditions conducive to the advancement of an expert's linguistic capabilities and professional identity. This development ensures both personal and professional growth, fostering the ability to make subjective choices and adopt essential values and priorities. A linguistic personality is an individual who speaks their native language, has a deep understanding of linguistics, excellent communication skills, and is committed to enhancing the elegance and progress of their own speech. The linguistic identity of a tourism professional is characterized by a commitment to linguistic standards, mastery of language culture, and the acquisition of professional and communicative competencies essential for successful interaction within their professional realm. It also involves the capacity to navigate communicative difficulties in professional scenarios that are intricate and uncertain. Thus, communicative culture is one of the key characteristics of future service sector professionals that they must acquire during their education in higher educational institutions. The work of professionals in this field is carried out through communicative activities, where communicative culture plays an important role. The study of communicative culture takes into account philosophical, cultural, psychological, and pedagogical aspects, which allows for the identification of various methodological approaches to its formation (Ferrada & Del Pino, 2020). The current state of communicative culture formation among service sector specialists in vocational schools does not fully meet society's demands for skilled workers in this sector. This necessitates the development of a system to enhance communicative culture formation, including the implementation of measures to improve this aspect of vocational training (Forsdberg *et al*., 2019).

Perspective, key elements constituting a conducive educational environment involve maintaining a positive psychological atmosphere, promoting mutual interaction, fostering collaborative efforts between teachers and students, providing pedagogical support, cultivating a friendly rapport among all participants in the pedagogical process, and integrating modern educational technologies into pedagogical methods and problem-based learning (Ugurluay & Kirikkaleli, 2022). Nurturing the linguistic personality of a tourism manager thrives in an educational environment that fosters active student engagement through communication. This participation can encompass cooperative dialogues about current challenges in the tourism industry, presentations on tourism services, executing interviews, and engaging in discussions and meetings with seasoned professionals. Such dynamic engagement develops the communicative persona of a tourism expert, distinguished by compliance with linguistic standards, command of the cultural aspects of language, and proficient communication skills tailored to their professional tasks. It also involves the capability to handle complex and unforeseen communicative obstacles in professional settings.

This comprehensive analysis highlights the paramount importance of developing communication culture and skills among service professionals, especially in the tourism industry, and emphasises the need to integrate a multifaceted approach to learning. It emphasises the need to integrate a multifaceted educational approach that covers not only the theoretical foundations of communication but also practical application in the real world. By focusing on individualised learning strategies, fostering a motivational

environment and implementing advanced technological tools, the framework aims to empower future professionals to effectively navigate and succeed in dynamic, service-oriented fields. The ultimate goal is for these individuals to be not only proficient in the technical aspects of their work, but also to excel in interpersonal communication, problem solving and adaptability, thereby making a significant contribution to service quality and customer satisfaction. Through a combination of educational innovation, strategic industry partnerships and a focus on holistic personal development, this approach aims to meet the changing needs of the service industry and prepare a new generation of professionals who are ready to succeed in their careers.

CONCLUSIONS

As a result of the study, it becomes clear that communication culture is one of the key characteristics that future service professionals should master while studying at higher education institutions. The work of professionals in this field is carried out through communication actions, where communication culture plays a significant role. The study of communicative culture takes into account philosophical, cultural, psychological and pedagogical aspects, which allows us to identify various methodological approaches to its formation. The structure of communication culture for professionals in this field includes several components aimed at developing competent specialists. When studying in professional educational institutions, these components are focused on solving problems that arise in the process of education and upbringing. The current state of formation of communication culture among service sector specialists in vocational schools does not fully meet the social requirements for qualified workers in this field.

This necessitates the development of a system for enhancing the formation of communication culture, including the implementation of measures to improve this aspect of professional training. On the basis of methodological approaches and taking into account the identified patterns and specific principles, the authors outline the pedagogical conditions for the formation of communication culture among service professionals. The analysis of their implementation, using the factor-quality qualimetry of educational institutions, indicates that the effectiveness of this process in pilot vocational schools mainly depends on content and technological factors. Communicative culture, which is cultivated by professional and self-development of future service professionals, is characterised by their creative mastery of appropriate communicative actions. The authors see the prospects for further research in the characteristics of the components of personal professionalism of future service professionals.

ACKNOWLEDGEMENT

None.

CONFLICT OF INTEREST

None.

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Формування комунікативної культури майбутніх фахівців сфери обслуговування: теоретичний аналіз та практичні перспективи

Анотація. Стаття висвітлює важливість вивчення комунікативної культури майбутніх фахівців сфери обслуговування із теоретичного та практичного поглядів. Основною метою роботи був аналіз та узагальнення сутності комунікативної культури в контексті професійного розвитку майбутніх фахівців сфери обслуговування, що забезпечує їхню соціальну активність і сприяє формуванню позитивних комунікативних умінь і якостей. У статті використано аналітичні та порівняльні методи дослідження комунікативної культури, а також здійснено аналіз сучасних підходів до формування комунікативної компетентності у майбутніх фахівців обслуговування. Підкреслено, що розвиток комунікативної культури майбутніх фахівців сфери обслуговування нерозривно пов'язаний з їх професійним та особистісним зростанням, що проявляється у творчому підході до оволодіння прийомами і способами ефективного спілкування. Зазначено, що водночас комунікативна культура відіграє важливу роль у формуванні соціальної активності фахівця, визначає норми поведінки та вчить користуватися відповідними засобами спілкування. Доведено, що завдяки знанням і вмінню використовувати адаптивні можливості комунікативної культури фахівці можуть успішно налагоджувати комунікацію з колегами та клієнтами, а також будувати свою кар'єру. Додатково, у статті проведено аналіз професійних якостей, якими повинен володіти фахівець у сфері обслуговування. Результати дослідження продемонстрували, що вивчення комунікативної культури має великий потенціал для покращення якості обслуговування та підвищення професійної компетентності. Практичне значення роботи полягає у можливості використання її результатів в системі іншомовної професійної підготовки майбутніх фахівців сфери обслуговування з метою покращення комунікативних навичок і підвищення ефективності спілкування в професійній діяльності

Ключові слова: професійна діяльність; мотивація; моделювання; вербальні та невербальні засоби спілкування; комунікативна культура; засоби спілкування

Vol. 2. No. 2. 2023 Scientia et societus
Received: 14.08.2023.
Revised: 16.11.2023.
Accepted: 12.12.2023.
Journal homepage: https://ses.journal.in.ua/index.php/ses/issue/view/4

UDC 378.147:[656+331.45]-051 *DOI: 10.69587/ss/2.2023.53*

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Forming the model of professional readiness of future specialists in vocational education (Transport, Occupational Safety and Health)

Abstract. The study on forming the model of professional readiness of future specialists in transport and occupational safety and health is relevant due to the constant transport technologies development and growing requirements for workplace safety. Accordingly, it is necessary to develop training approaches that meet the current challenges and needs of the industry, providing future professionals with not only technical knowledge but also risk management competencies and the ability to work in conditions of constant change. The purpose of the study was to search an effective model of professional readiness that would facilitate the training of competent, highly skilled and innovation-oriented future specialists in vocational (professional) education. The use of theoretical methods (analysis, synthesis, systematization and generalization, modeling, and comparison) has helped the authors to solve several tasks. The results of the study include the block analysis of the model of professional readiness of future specialists in vocational education, and a brief description of the modeling tasks (optimizing the structure of the educational material, improving the educational process planning, managing cognitive activity, managing the educational and cognitive process; diagnostics, forecasting and design of training). The author's model of the formation of professional readiness of future specialists in vocational education (Transport. Occupational Safety and Health) has been developed, which has the property of integrity, since all its components are interconnected and should work for the final result - the achievement of a high level of professional readiness for the future type of activity by future specialists, the tasks of professional training of future specialists in vocational education (Transport. Occupational Safety and Health) have also been formed. The author focused on the main contradictions and “problematic” properties of the modelling method. The main components of the proposed model are highlighted, such as: social order, purpose, tasks, interactive technologies, methods, forms, means, criteria and levels of formation, and interconnection, which make the process of forming professional competencies more effective. The practical significance of the study is the development of pedagogical conditions and the model of forming the future vocational education specialists' readiness, its implementation in the practical training at the Hryhorii Skovoroda University in Pereiaslav

Keywords: European standard; blocks; professional competence of modeling; program outcomes; educational process; pedagogical research

Suggested Citation:
Levchenko, I., & Lytvyn, A. (2023). Forming the model of professional readiness of future specialists in vocational education (Transport, Occupational Safety and Health). *Scientia et societus*, 2(2), 53-62. doi: 10.69587/ss/2.2023.53.

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INTRODUCTION

Reforming and ensuring a high level quality education in Ukraine are becoming critical to its national sustainability and future success. In particular, this is important for the modernization of vocational education and training (hereinafter – VET) system, especially in the field of transport and occupational safety and health. Forming an effective model of future specialists' professional readiness is becoming an urgent task in the context of the rapid development of technologies in transport and increased requirements for occupational safety and health. This approach can help to improve the professional training quality and provide students with the necessary competencies for a successful career under the requirements of the modern labor market.

An analysis of recent research and publications on the topic under study has made it possible to define that there is a modern science tendency to move from descriptive to modeling and forecasting its results. Prominent Ukrainian scientists have studied theoretical and applied aspects of modeling (Korniichuk, 2019; Kubrak, 2019; Krishtanovych *et al.*, 2021). However, the most important studies for this paper are those that addressed the issues of modeling, particularly in VET. A significant number of issues related to the development of the modeling process in VET have been revealed by Ukrainian scientists. The quality of training future vocational education specialists must meet the high requirements of the European educational space. It is these requirements for the VET system that encourage scientists as practitioners to focus their efforts on creating an effective model of the content of education not just for a specialist, but for a professional of a new formation, following the general patterns of formation and self-development of a person capable of transforming, modeling and correcting the professional space (Radkevych *et al.*, 2021).

Following the leading modern educational sphere trends the system of vocational training of highly qualified specialists (Transport. Occupational Safety and Health) needs improving its content and changing the pedagogical paradigm in the systematic justification, developing and creating the effective model of the educational process. There are different definitions of the concepts of "model" and "modeling" in the scientific literature. From a philosophical point of view, a model is an imaginary, represented, materially realized system that can reflect or reproduce the object of study, and replace it so that the study of it gives us new information about this object (Conceptual and technological model of..., 2022). At the same time, the Ukrainian researcher L. Tkach (2019) emphasizes that modeling as "a universal process of cognition can be used in research and contribute to the transformation of phenomena in any field of activity", since its purpose is to create a model of the real object under study, the object of modeling in the authors' study should be considered a part of pedagogical reality, namely a practical training, development the model which is the purpose of pedagogical modeling. Thus, the subject of modeling (in this case, practical training) is the part of the object of modeling (professional training of future vocational education specialists (Transport. Occupational Safety and Health)). That is why Ukrainian scientists consider the professional training of future vocational education specialists, as an object of modeling, to be an opportunity to implement scientifically based models, in particular, of different levels of compliance, completeness and systematic reflection, etc. (Modeling of the pedagogical process..., 2023).

Thus, there is no unambiguous interpretation of the concept of "model" in scientific sources. From the above definitions, it follows that modeling is the artificial creation of a system that is fully or partially capable of reproducing the essence and quality of the original (Kolesnyk, 2019). The need to develop a model of professional readiness for future VET specialists is conditioned by the modern society's needs to form competent specialists, and the development of interest in teaching can be an essential factor in improving the quality and effectiveness of training future teachers of vocational and technical education institutions (hereinafter – VTEIs) for such an important process as the formation of teachers' professional readiness for the future profession (Borodiyenko *et al.*, 2023). The purpose of the article was to form a model of professional readiness of future specialists in vocational education (Transport. Occupational Safety and Health). To achieve this goal the following tasks are defined: 1) based on the study of the state of the problem in pedagogical theory, to substantiate the structure of professional readiness of future specialists in vocational education (Transport. Occupational Health and Safety); 2) to determine the methodological principles of forming the model of professional readiness of future specialists in vocational education (Transport. Occupational Safety and Health); 3) to theoretically develop a model of professional readiness of future specialists in vocational education (Transport. Occupational Safety and Health). The scientific novelty of the study is that the essence of the concept of "professional readiness of future specialists in vocational education", "model", "modeling" and components of readiness (motivational and value, cognitive and intellectual, normative and operational, personal and communicative) is clarified; the principles of formation of future specialists' professional readiness are determined; the theoretical and functional model of formation of professional readiness of future specialists in vocational education (Transport. Occupational Safety and Health) is developed.

MATERIALS AND METHODS

Following the purpose and defined tasks, the authors have used several scientific methods that contributed to solving the issues raised in the course of the study. To achieve the goal general scientific research methods have been used to a greater extent, which include empirical research methods, analysis, synthesis, systematization, and generalization. Theoretical analysis and synthesis have made it possible to analyze scientific works in the field of vocational pedagogy and methods of VET experience in educational activities of

teaching staff; modern pedagogical concepts; scientists' different views on the problem under study, and identification of research areas. The methods of systematization and generalization has helped to focus on pedagogical models of future specialists' readiness for professional activity by Ukrainian scientists, namely: to systematize the proposed models according to the specifics of the specialty (future teachers, future psychologists of the operational rescue service, heads of VTEIs, future rescuers, bachelors of computer technology, computer science teachers, future border guard officers); to summarize the pedagogical components of the proposed models (target, theoretical and methodological, organizational and content, evaluative and effective, conceptual, functional, technological, regulatory and targeted). The content analysis has helped to clarify and specify the conceptual and categorical apparatus for the formation of professional competence of future specialists in vocational education. Comparison, as a method of cognition belonging to many empirical research methods, has allowed the authors to consider the object under study separately and indicate the features by which it can be compared. Thanks to this method, the authors have made a comparative analysis of the modeling process in VET by specialization and identified common and distinctive features of pedagogical models of future specialists' professional readiness. The authors have also applied "modeling" as the universal method of scientific cognition. Thanks to it, the pedagogical model of the readiness of future vocational education specialists (Transport. Occupational Safety and Health) has been developed. This model is used by the authors of the article in the educational process. Due to the successful combination and use of the considered research methods, the defined tasks have been realized.

The research is based on and fully complied with the principles of the dimensional approach. At the first stage it has allowed the authors to study a whole array of information in order to prepare the theoretical basis of the work. The principles of this approach have been also applied to the subsequent stages of the research. The use of the dimensional approach has significantly enriched the understanding of the complex phenomena studied in this paper, as it allows understanding their multifaceted nature and the interrelationships between different aspects. A graphical method has also been used in the study to visually present the relationships between different components of professional readiness, such as theoretical knowledge, practical skills, personal qualities, and the ability to respond to unforeseen situations. It has helped the authors to display the structure of the model in the form of a diagram, where each component is presented as a separate block, and their interconnections are represented as arrows indicating the interaction between them. This has contributed to a better understanding of how different aspects of professional readiness are interconnected and how they affect the overall effectiveness of training. The graphical method made it possible to identify key entry and exit points in the process of professional readiness formation, which further have helped to identify priority areas for improving the educational process. This approach has allowed the authors not only to visualize the theoretical model but also to plan practical steps for its implementation, as well as to predict potential challenges and ways to overcome them.

At the last stage of the study, a generalization method was used to analyze, systematize, and integrate various studies, theoretical approaches, and practical examples related to the training of specialists in the fields of transport and occupational safety and health. Using the method of generalization the authors have been able to define the main components of professional readiness, identify proven and effective training practices, and highlight the necessary competencies that future specialists should develop. The application of this method has included studying scientific literature, the analysis of regulatory documents, studying courses and training programs used in VET. The method of generalization has been used to formulate conclusions and recommendations regarding the research topic.

RESULTS AND DISCUSSION

As Ukraine fights daily for its right to independence, language, culture, and full-fledged existence, the educational community has intensified the search for effective approaches to training specialists in VET. This study focuses on such specializations as "Transport" and "Occupational Health and Safety", which are important for the development of the Ukrainian economy, statehood, and the educational level of citizens. The effectiveness of changes aimed at achieving stability in Ukraine is measured by the availability of well-trained specialists in demand in the domestic labor market. Therefore, it is important that future specialists in VET could receive high-quality and relevant knowledge that they can apply in their future professional activities.

It should be noted that, under the social and economic changes taking place at the present stage of VET development, there are new requirements for a future vocational education specialists, characterized by their readiness for a high degree of physiological, psychophysical, and emotional tension. Hence, the system of training future specialists for professional activity should be increasingly aimed at developing their readiness for real professional activity, where, along with its features mentioned above, the formation and development of their personal and conditioned qualities is carried out. The "professional readiness of future specialists in vocational education" should be understood as a system-forming factor of professional activity, the purpose and result of training vocational teachers in the context of the introduction of a new educational paradigm, taking into account the current socio-economic requirements for the development of the vocational education system (Kholodnyi *et al.*, 2021). According to S.V. Kolesnyk (2022), a readiness, as an integrative quality, should be considered as a set of complex personal formations, which should include professional and moral orientation views and beliefs,

professional orientation of mental processes, professional knowledge, skills, attitude to pedagogical work, desire to overcome difficulties, self-esteem of this work results, the need for professional self-improvement.

To effectively design the model of readiness for future specialists in vocational education (Transport. Occupational Safety and Health) it is necessary to consider the concept of "model" in pedagogical science. In the Encyclopedia of Education, a model is defined as an imaginary system that should reflect or reproduce the object of study; a sign system that can reproduce the didactic process, show the structure in its integrity; functioning and preserving integrity at all stages of the study (Pedagogical academy of..., 2008). Pedagogical modeling consists of the study of pedagogical objects (phenomena), and this process should take place in coordination and a complex of conceptual, procedural, structural and content, conceptual characteristics and individual "sides" of the educational process within a certain socio-cultural space at the general education, vocational or other levels. What is the main advantage of modeling as a method of pedagogical research? It lies in the possibility of covering the system holistically and, as a result, improving the planning of the educational process, optimizing the structure of educational material, increasing the effectiveness of the educational process, building and interpreting a new theory, testing the hypothesis of pedagogical research (Mykhailov, 2021).

Modeling in pedagogy is used to solve the following problems: 1) optimizing the structure of educational material; 2) improving the planning of the educational process; 3) managing cognitive activity; 4) managing the educational and cognitive process; 5) diagnostics, forecasting, and designing learning (Korniichuk, 2019). It is important to realize that pedagogical modeling involves the use of abstraction and idealization procedures since the subject of modeling is a complex system that is reflected in interconnected models that complement each other. The need to develop the model of forming professional readiness of future vocational education specialists (Transport. Occupational Safety and Health) is conditioned by the needs of society in the competent specialists formation. Moreover the development of interest in professional activity can be an essential factor in improving the quality and efficiency of teachers training, forming their professional readiness for the future profession (Kurysh, 2022).

In the psychological and pedagogical literature, professional readiness is considered to be a state of the individual that is characterized by the availability of professional knowledge and skills, motivation to implement them in activities, and the ability to overcome difficulties in professional tasks realization (Sirokha, 2019). In this case, the essence of the future specialist's readiness for professional activity should be assessed on the basis of his/her professional, social and psychological, and physical readiness for future activities. In this study, the main aspect is aimed at creating the authors' pedagogical model to be applied in practice (Hryhorii Skovoroda University in Pereiaslav, Faculty of Technological and Mathematical Education, Department of Theory and Methods of Vocational Training), that will help to achieve the goal – to prepare future vocational education teachers (Transport. Occupational Safety and Health) for the implementation of professional skills in VTEIs. Vocational education teachers are responsible for teaching professional disciplines in VTEIs. They are called upon to provide quality knowledge to future vocational workers. At the bachelor's and master's levels of education, students acquire the necessary professional competencies and program outcomes that are successfully applied in the course of professional activities (Stynska, 2020). It is the peculiarities of master's programs that allow applicants to choose the educational components that will be needed in their future professional activities and skills (Novak *et al.*, 2019). The realization that an effective educational process in VTEIs depends on the introduction of a modern and effective pedagogical model will allow the future teacher to find a model that meets European standards of vocational education (Vitvytska, 2019).

Author V. Mykhailov (2021) analyzes different models of the future vocational education specialists' professional readiness by Ukrainian scientists. In particular, O. Yaroshynska's pedagogical model of future primary school teachers training for professional activity (having the following its components: methodological and target, content and procedural, diagnostic and effective; V. Fritsyuk's structural and functional model of the system of training future teachers for professional self-development (components: target, theoretical and methodological, organizational and content, evaluation and result); R. Sirko's structural and functional model of professional training of future psychologists of the operational-rescue service (components: conceptual, functional, technological, evaluative and effective); O. Samoilenko's model of advanced training for heads of VTEIs at the stage of managed independent work using distance learning technologies (components: target, content and organizational, operational, effective); I. Koval's structural and functional model of forming the future rescuers' professional readiness for activities in extreme conditions (components: conceptual and strategic, procedural and technological, control and evaluation); I. Sigetius's model of developing teachers' readiness for information and management activities in the system of postgraduate education (components: theoretical, content, and effective); O. Sazhienko's experimental model of forming the professional competence of bachelors in the field of computer technology in the process of professional training (components: target, content, operational and effective); O. Zyahar's model of developing the computer science teachers' information and communication competence (components: normative and target, content, organizational, methodological, diagnostic); O. Lemeshko's model of formation of the future border guard officers' professional readiness to localize non-standard situations at border crossing points (components: conceptual, organizational and methodological, performance and evaluation).

Thus, each model is individual and specific to a particular specialization, but there is an interesting trend that lies in the common blocks of all models: conceptual, content, organizational, evaluative, and effective. These components (blocks) are relevant to the authors' model of determining the future vocational education specialists' readiness for professional activity, so it is worth applying them in a scientific study. The model of forming the professional readiness of future specialists in vocational education (Transport. Occupational Safety and Health) developed in the study has the characteristic of integrity, since all its components are interconnected and should work for the final result, that is the achievement of a high level of future specialists' professional readiness for the future activities. The authors have formed the model blocks to combine important components for the successful implementation of the assigned task. The importance of each of these blocks is detailed. The *conceptual and target block* consists of the scientific substantiation of the problems; it can reflect the planned learning outcome (through the goal and objectives) and the methodological basis of the study. Also it should include scientific approaches and principles that contribute to the training of future VET specialists (Transport. Occupational Safety and Health) for future professional activities. Based on the purpose of the study, the objectives of professional training of future vocational education specialists (Transport. Occupational Safety and Health) have been stated:

- to form a motivational and value-based attitude of future specialists to their professional duties;
- to develop skills and abilities to carry out professional activity aimed at improving of its quality;
- to form the necessary personal qualities that determine the professional readiness of future vocational education specialists to implement their job responsibilities.

The theoretical and methodological basis of the model involves the use of acmeological, axiological, activity-based, competency-based, personality-oriented, professional-personal, reflective, and systemic approaches (Pohrebniak, 2019). According to S.V. Kolesnyk (2022), the principles for functioning of the model of forming the future VET specialists' professional readiness include the following: continuity, humanization, integration, openness and dynamism, scientificity, interdisciplinarity, individualization, problematicity, innovativeness, creativity, independence, reflexivity, and focus on professional activity.

The essence of the *organizational and content block* reflects the structure, content, functions, and pedagogical conditions of professional training of future vocational education specialists (Transport. Occupational Safety and Health). The principle of interdisciplinary integration of general theoretical, profession-oriented disciplines and special courses on the subject of the study has been used in the development of the content of the training. So, this block not only reflects the structure, content, functions and pedagogical conditions of professional training of specialists in VET but also includes a system of their knowledge, skills, and abilities in the disciplines and special courses of the specialization. The functions of the process of professional training of future vocational education specialists are cognitive, educational, developing, communicative, adaptive, active, and integrated one (Kovalchuk, 2021). The *procedural and activity block* involves the development of professional skills of future teachers of VET (Transport. Occupational Safety and Health) through a complex and long process that takes place over several stages. The first stage of vocational teachers' development is ensured through their participation in various activities of methodological work in VTEIs, the application of innovative pedagogical and industrial experience. Improvement and expansion of knowledge and skills in technology and methods of applying them in practice take place at the first stage of the development of the professional culture of VET teachers. The second stage ensures the individual development of future VET teachers in a continuous process of self-education, self-improvement, and self-development (Krishtanovych *et al.*, 2021).

The reflective and evaluative block involves the development and implementation of methods for diagnosing individual indicators of readiness of future vocational education specialists in the specialty disciplines of the studied profile. To ensure a higher level of professional training for future VET specialists the following conditions must be met: to strengthen the applied and professional orientation of training, changing the ratio of theoretical and practical training; to increase a significant share of elective courses for future VET specialists to better acquaint them with the peculiarities of future professional activities; to increase the share of independent extracurricular work, and use modern methods and means of its control; to apply modern pedagogical and information and communication technologies, psychological and didactic concepts that will make it possible to bring learning activities closer to the professional idea of contextual learning; to design new professionally relevant courses and their teaching and methodological support, an integral component of which should be electronic dictionaries and encyclopedias, e-textbooks and e-manuals, electronic health diaries, educational portals; to modernize methodological teaching systems for basic professionally relevant courses based on a competency-based approach (Sabatovska & Bobokalo, 2019). Only such approaches to teaching should ensure an increase in the prestige of Ukrainian VET and bring it closer to European standards (Radkevych *et al.*, 2020).

The process of developing the model for the development of professional competencies of future specialists in vocational education (Transport. Occupational Safety and Health) provides a competency-based framework that should improve the future specialist' qualifications for a purposeful process of professional training in the interests of society and the state. The model should meet the requirements of the VET regulatory framework and be perceived as a reference process according to which the program learning outcomes should be achieved.

It is worth characterizing the main difficulties of the modeling method concerning pedagogical research (pedagogical modeling), namely:

1. Pedagogical modeling is abstract, unlike other types of modeling (technical, medical, etc.).

2. Pedagogical modeling depends on many subjective factors, including those directly related to the student and the teacher, etc.

3. Pedagogical modeling is not material (the model cannot be felt by the senses as seeing, hearing, feeling, etc.).

4. Pedagogical modeling is of a delayed temporal nature (the model effectiveness is tested over a sufficiently long period as months, years, etc.).

5. Pedagogical modeling doesn't have objective control methods (the model implementation effectiveness doesn't have precise objective criteria expressed in accurate and specific digital equivalents that are verified and confirmed by objective control methods) (Tsymbal-Slatvinska, 2019).

The study presents only the main "problematic" properties of pedagogical modeling. As can be seen, modeling is a very complex and ambiguous process, which is especially clearly understood and acutely felt when it is widely used in educational and methodological, scientific and practical, professional and applied activities. The authors of this study consider that the main difficulty and ambiguity of pedagogical modeling lies in its subjectivity and delayed effectiveness (there is too much dependence of the result on the individual, time, and often simultaneously on the individual and time). This is important when conducting pedagogical experiments and observations that last for years. During this long time, the personality itself (a student and sometimes a teacher; a test person and a tester) changes in many ways, which makes the results of the study not always correct and accurate. It should be noted that such complexities and ambiguities are inherent not only in pedagogical modeling but also in pedagogy in general (especially in the substantiation, development, creation, and use of pedagogical concepts, systems, etc.), as well as other types of modeling (psychological, philosophical, sociological, cultural, etc.) and the sciences that produce and actively use them (psychology, philosophy, sociology, cultural studies, etc.) (Kubrak, 2019). From all of the above, we can state that the method of pedagogical modeling is not quite perfect and ideal (like a number of the above-mentioned modeling), so, when using and analyzing it, this fact should be firmly known and always taken into account, together with appropriate corrections should be made, and the results should be interpreted under all of the considered circumstances.

In the practical part of the study, the model of professional readiness of future VET specialists for further pedagogical activities has been formed, which could contribute to the formation of the necessary professional competencies and, as a result, the acquisition of program outcomes. To effectively ensure the assessment of the level of professional readiness of future vocational education specialists for professional activity, according to L.I. Korotkova (2019), the following conditions should be met: to accurately determine the structural components of the model; to unambiguously define the parameters of the proposed model; to substantiate the structure of its indicators. Within the framework of the study, the proposed model is understood as a holistic pedagogical process that should combine the approaches, methods and techniques of teaching, directing them to the students' acquisition of knowledge, skills, techniques and experience of pedagogical activity, as well as to the development of the future specialist personality as a highly professional subject of professional activity. The structure of the proposed model is represented by the following interrelated blocks: conceptual and target, organizational and content, procedural and activity, and reflective and evaluative. Their main components are social order, purpose, objectives, interactive technologies, methods, forms, tools, criteria and levels of formation, and interconnection, which makes the process of forming professional competencies more effective. Figure 1 shows the developed model of professional readiness of future specialists in vocational education (Transport. Occupational Health and Safety).

The proposed model of forming the professional readiness of future specialists in vocational education has characteristic features of flexibility and variability, allows to take into account the changes taking place in society, to respond to the requirements for the level of VET specialists training, to provide VET students with the opportunity to form the necessary professional competencies in the learning process (Fig. 1). To develop the model of forming the professional readiness of future specialists in vocational education (Transport. Occupational Safety and Health) the authors analyzed the source base, which allowed to effectively adjust and summarize the important components of the modeling process in VET. The process of modeling the pedagogical system of professional training of future service professionals, which is part of VET, has been analyzed in the article by L. Korotkova (2019). The Ukrainian researcher L. Sirokha (2019) competently substantiates the professional readiness of the individual for future activities and emphasizes the importance of successful professional activity as an integral part of the future specialist. An important study for the development of VET should be considered the work by V. Mykhailov (2021) on the important components of pedagogical modeling of the development of civilian security specialists' professional competence. For our study the mentioned work is particularly interesting, since the modeling process has been considered in the context of studying the educational component "Civil Security", which is thoroughly studied in the educational program 015 Vocational Education (Transport. Occupational Safety and Health). The issues of modeling VET in the conditions of the master's degree are the subject of works by researchers I. Sabatovska & S. Bobokalo (2019). In the scientists' opinion, the master's level of training of future specialists requires a high level of

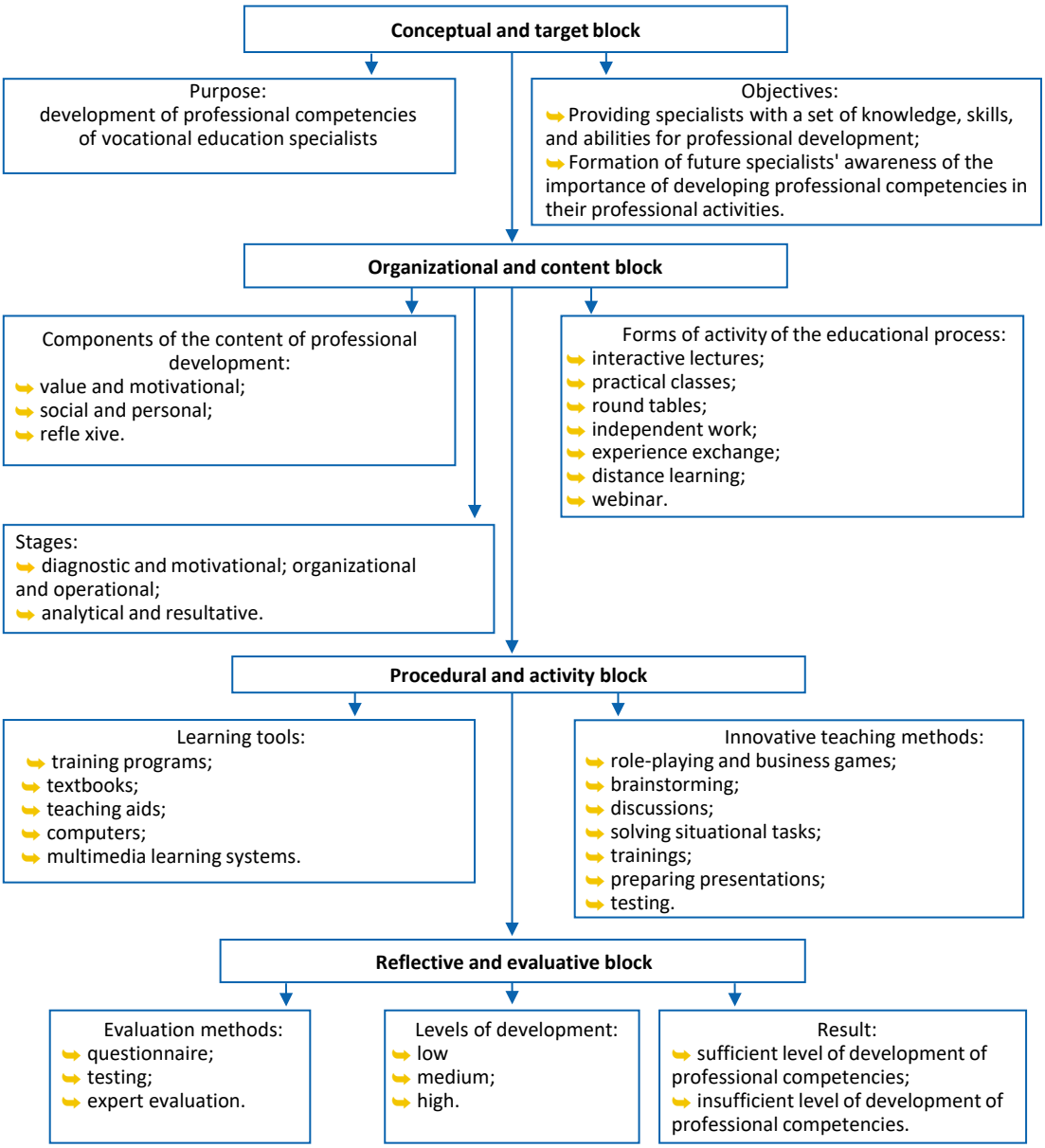

Figure 1. Model of forming the professional readiness of future specialists in vocational education (Transport. Occupational Safety and Health)

Source: the scheme was developed by the authors based on their own experience, which is being implemented at the Department of Theory and Methods of Professional Training at Hryhorii Skovoroda University in Pereiaslav

readiness for professional activity, that is why the process of pedagogical modeling has positive properties for the formation of professional competencies.

An essential vector for writing this article is sectoral (industry) modeling, which has been covered in the works of Ukrainian scholars. We have analyzed studies that highlighted the issue of the readiness of future vocational education specialists for professional activities in various fields. For example, L. Tkach (2019) focuses on an important aspect in the practical training of future specialists in the field of "Bakery, confectionery and pasta products, production of food concentrates". The researcher has found out that the structural and functional model affects the quality organization of practical training of future specialists, and proposed the model consisting of such components as target and methodological, content, subject-subject, activity, and resultative one. D. Pogrebnyak (2019) proposes his own definition of the terms "model" and "pedagogical modeling", and also the model for the development of professional competence of physical education and sports managers, using a schematic representation of it and revealing the content of all its components (goals and objectives, organizational and pedagogical conditions, content, methods, forms of organization of educational activities, criteria and indicators for diagnosing learning outcomes).

The authors of the article emphasize the importance of creating integrated models of professional training that meet the current needs of the labor market and society. The role of reflexive analysis and evaluation is important, because they make it possible to track the effectiveness of training programs and make adjustments to optimize them. The main challenges associated with pedagogical modeling include the abstract nature of the method, dependence on subjective factors, and the lack of unambiguous objective criteria for evaluating effectiveness. Despite these difficulties, modeling is a key tool in the training of future professionals, providing a flexible response to dynamic changes in the professional and socio-economic environment. This proves that pedagogical modeling is fundamental for the development and implementation of effective educational strategies aimed at training highly qualified specialists capable of meeting modern requirements and challenges.

CONCLUSIONS

Thus, the pedagogical model should be considered as consistent purposeful and coordinated actions by participants of the educational process in order to solve specific educational tasks in pedagogical situations (proposed by the teacher), which ought to be consistently variable and subordinated to the final result – the forming professional readiness of future specialists in VET (Transport. Occupational Safety and Health) for effective professional activity. The authors have been found that the specialist' professional readiness is formed in the course of a dynamic, developing process of curricular and extracurricular activities, therefore, a readiness as an integrative quality of personality is a dynamic phenomenon. Its formation is possible only in complex of all the components, only in this case, we can talk about the completeness of the process of forming readiness following the model of vocational education (Transport. Occupational Safety and Health). This approach will help to solve the problems that occur during the adaptation and professionalization of young specialists. For the successful formation of professional readiness of a future vocational education specialist, it is necessary to resolve the main contradiction between the achieved level of readiness (development) of the student and the requirements that are imposed on him/her due to the specifics of professional and pedagogical activity. A condition for resolving this contradiction and turning it into a driving force for the self-realization of the student's personality is a high level of formed readiness components.

So, the model of forming the professional readiness of future specialists in vocational education has been proposed for implementation and practical realization, scientifically and theoretically substantiated, structurally and substantively developed, conceptually and categorically formulated with the help of conceptual and target, organizational and content, procedural and activity, reflective and evaluative blocks, and aimed at training highly qualified future specialists in vocational education (Transport. Occupational Safety and Health). To determine the effectiveness of vocational training it is important to use criteria, indicators and levels of the formation of future specialists' professional readiness for future activity in VET. The authors state that it is impossible to study, analyze and present all aspects of the problem under study in one scientific work, even the most detailed one. The further work is planned to be devoted to the study and analysis of other aspects of the formation of professional readiness of future vocational education specialists. In particular, the subject of further research will be the diagnosis of the future specialists' professional readiness, together with the study of the structure and content, methods, and forms of professional training. The proposals and prospects for modernizing the professional training of future specialists for professional activities are planned to be formulated.

ACKNOWLEDGEMENTS

We would like to thank the library of the Hryhorii Skovoroda University in Pereiaslav fortheir technical assistance and ideas that made the research possible.

CONFLICT OF INTEREST

None.

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Формування моделі професійної готовності майбутніх фахівців професійної освіти (Транспорт. Охорона праці)

Анотація. Дослідження щодо формування моделі професійної готовності майбутніх фахівців з транспорту та охорони праці є актуальним у зв'язку з постійним розвитком транспортних технологій та зростаючими вимогами до безпеки на робочому місці. Відповідно до цього, необхідно розробляти підходи до навчання, які враховують сучасні виклики та потреби галузі, забезпечуючи майбутнім фахівцям не лише технічні знання, але й компетенції з управління ризиками та вміння працювати в умовах постійних змін. Мета дослідження полягала в пошуку ефективної моделі професійної готовності, яка б сприяла підготовці компетентних, високопрофесійних, іноваційно-орієнтованих майбутніх фахівців професійної освіти. Використання методів теоретичного рівня (аналіз, синтез, систематизація та узагальнення, моделювання, порівняння) допомогли авторам вирішити низку поставлених завдань. Результати дослідження містять аналіз блоків моделі професійної готовності майбутніх фахівців професійної освіти, короткій характеристиці завдань моделювання, які полягають в оптимізації структури навчального матеріалу, покращенні планування навчального процесу, управлінні пізнавальною діяльністю, управлінні навчально-пізнавальним процесом; діагностиці, прогнозуванні, проектуванні навчання. Розроблено авторську модель формування професійної готовності майбутніх фахівців професійної освіти (Транспорт, Охорона праці), яка має властивість цілісності, оскільки всі її компоненти взаємозв'язані між собою та мають працювати на кінцевий результат – досягнення майбутніми фахівцями високого рівня професійної готовності до майбутнього виду діяльності, були також сформовані задачі професійної підготовки майбутніх фахівців професійної освіти (Транспорт. Охорона праці). Закцентовано увагу на основних суперечностях і «проблемних» властивостях методу моделювання. Виділено основні компоненти запропонованої моделі, а саме: соціальне замовлення, мета, завдання, інтерактивні технології, методи, форми, засоби, критерії та рівні сформованості, взаємозв'язок, які роблять процес формування фахових компетентностей більш ефективним. Практичне значення дослідження полягає у запровадженні педагогічних умов та моделі формування готовності майбутніх фахівців професійної освіти, реалізації зазначеної моделі у практичній підготовці фахівців в Університеті Григорія Сковороди в Переяславі

Ключові слова: європейський стандарт; блоки; фахова компетентність моделювання; програмні результати; освітній процес; педагогічне дослідження

Vol. 2. No. 2. 2023 Scientia et societus
Received: 28.07.2023.
Revised: 30.10.2023.
Accepted: 12.12.2023.
Journal homepage: https://ses.journal.in.ua/index.php/ses/issue/view/4

UDC 378.147.091.33-027.22 *DOI: 10.69587/ss/2.2023.63*

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Pedagogical practice as the basis for the formation of pedagogical values of future teachers in higher education institutions

Abstract. Modern conditions for the development of higher education and accordingly, changes in the role of the teacher in this process necessitate improving the system of training future teachers of higher education institutions and developing not only professional, intellectual, moral, social skills, but also encouraging them to self-development, self-education, self-improvement as a manifestation of a value-based attitude to the performance of professional duties, which prompted the study. The purpose of the article was to study and analyse the role of pedagogical practise in the formation of pedagogical values of future teachers of higher education institutions. The article used the methods of analysis of scientific and pedagogical literature, comparative analysis, systematisation and comparison of scientific approaches, provisions, and generalisation of research results. In the course of the study, theoretical approaches to the formation of pedagogical values were identified; a classification of pedagogical values was made, in particular: values related to the personal and motivational sphere of the teacher, values reflecting aspects of educational management; the importance of introducing new approaches (active learning, problem-based learning, cooperation, pedagogical partnership, differentiated learning) to the organisation of the educational process and the introduction of innovative technologies based on pedagogical values was emphasised. The practical significance of the work lies in the fact that the results can be utilised by higher education instructors in the process of professional training. This process lays the foundation for the professional activities of future educators who possess scientific and methodological teaching proficiency, practical skills, and abilities. It shapes the professional qualities of the future educator's personality directed at consolidating and implementing the acquired subject-specific, psychological-pedagogical, and methodological knowledge, skills, and abilities. On the other hand, it serves as a means for the creative development and self-improvement of the future instructor in higher education institutions. It can also be applied in writing qualification works, organising pedagogical practise in higher education, and the self-improvement process of educational professionals

Keywords: pedagogical practise; higher education; higher education student; competence; competency; higher education teacher; pedagogical values

Suggested Citation:
Bahno, Yu., & Serhiichuk, O. (2023). Pedagogical practice as the basis for the formation of pedagogical values of future teachers in higher education institutions. *Scientia et societus*, 2(2), 63-72. doi: 10.69587/ss/2.2023.63.

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INTRODUCTION

In modern educational environment of higher education institutions, teachers are taking on a new role: they should not only transmit information, but also contribute to the development of intellectual, moral, social and professional skills, encourage students to self-development and self-improvement. This requirement is driven by the need to prepare the younger generation to meet the challenges of the modern world. That is why teachers should approach their students as individuals with their own needs, capabilities and perspectives on the basis of humanism, because in modern conditions, understanding, respecting students' own opinions, supporting their personal development and taking into account individual characteristics is not a requirement, but a demonstration of the level of professional competence of a teacher in a higher education institution. The educational environment of today is changing rapidly, so teachers must be prepared for rapid, dynamic changes in the global world and educational reforms in particular, which affect the participants in the educational process and require the introduction of the latest teaching methods and technologies, understanding of students' emotional and psychological needs, continuous self-improvement and professional growth, and the manifestation of moral and civic values. Awareness of the significance of this problem encourages scientists to conduct research and solve unsolved problems.

According to O. Voloshyna (2023), the peculiarities of forming a responsible attitude of future teachers to the system of pedagogical values based on scientific analysis involve the interpretation of the definition of "value" in the psychological and pedagogical aspect: the values of each personality are concepts and beliefs that determine the direction of their behaviour, encourage activity, determine the specifics of the manifestation of feelings, relationships and consist in understanding the generalised social experience that they receive in the process of development, which depends on the sociocultural. Exploring the essence and content of the pedagogical values of a practical teacher, the author T. Belan (2021) in his work identified the need to form personal and universal values (respect and love for children; self-demanding; striving for truth; tolerance; responsibility; honesty and dignity; own health and environment; kindness and humanity; willingness to help; ability to self-discipline; insightfulness; sensitivity; liberality; self-confidence; cheerfulness) and pedagogical values (professional thinking; pedagogical creativity; independence and courage in defending one's position; individual pedagogical style of communication with students; good manners; self-control; self-education; active pedagogical life).

At the same time, N. Onyshchenko (2021) identified the following typical shortcomings of pedagogical practises: insufficient hours and credits for pedagogical practise; lack of clearly developed practise programmes, constant changes in their requirements, goals, objectives; lack of practical skills to perform professional activities; insufficient provision of pedagogical practises with educational and methodological material; insufficient control over the process of pedagogical practise by methodologists and teachers; the formal nature of summing up the results of pedagogical practise; the mismatch between pedagogical institutions of higher education and secondary education; students' practise in different educational institutions. The organisation of pedagogical practise requires constant support of students. The application of this method is due to V.E. Benera (2018) the general humanistic concept of education; focus on the development of the individual and society as the intrinsic value of education; reliance on the internal development potential of any system; awareness of the new essence of methods of individualisation and differentiation in education as a way of personal development of students.

During the pedagogical practise V. Mykolaiko (2023), students develop and analyse their own programmes of activity, based on personal orientation, general and professional training, individual characteristics, which take into account the level of their pedagogical culture, tolerance as key indicators of pedagogical values. The following functions of pedagogical practise contribute to this:

- developmental (optimisation of pedagogical thinking, professional culture, worldview, cognitive activity, independence and research skills, self-education);
- educational (formation of an active life position, responsibility, professionally significant personal qualities, interest and love for teaching);
- organisational (interaction and cooperation of all participants in the educational process);
- communicative (communication of all participants in the educational process on the basis of mutual understanding, mutual respect, empathy, partnership, creation of a friendly atmosphere, support and mutual assistance based on the principles of morality);
- diagnostic (reflection, assessment of the level and quality of pedagogical activity, the ability to self-control, self-analysis and self-evaluation).

The function of modelling, as a prediction and forecasting of the results of pedagogical practise, is of particular importance. Important from a practical point of view T. Alieksieenko *et al*. (2020) are relevant seminars and conferences where students can try themselves as a teacher-researcher as a form of learning and a way to intensify the educational process and form their culture of mental work, manifestation of a valuable attitude towards colleagues, teachers and society. Despite the significance of the role of pedagogical practise, experience and elaboration of the problem, there are several challenges associated with this process. The analysis of scientific and pedagogical literature and pedagogical practise programmes has shown that in many cases, the practise does not cover all aspects of the professional training of future specialists, and contains an insufficient number of hours for a full study of individual educational components of professional activity. Under such conditions, teachers are the drivers of social activity and the development of important interpersonal qualities,

such as cooperation, leadership and responsibility, and professional duty. At the same time, there is a problem of not always effective interaction between higher education institutions and bases of pedagogical practise of higher education students. That is why the problem of the lack of a clear link between the knowledge gained and its practical application, as well as the loss of opportunities for students to study and analyse the real pedagogical process in depth, is focused on solving it. Thus, in the context of the modern educational system, it is important to solve these problems and improve the process of pedagogical practise to ensure the quality training of future teachers, in particular, teachers of higher education institutions, contributing to the formation of their pedagogical values and professional skills. The purpose of the article was to study the experience of forming pedagogical values of future teachers of higher education institutions in the process of pedagogical practise.

MATERIALS AND METHODS

The article includes a study of the role and content of pedagogical practise in the process of forming a future higher education teacher from 2018 to 2023, based on a comparative analysis of leading scholars. The main views and conclusions are presented in Table 1.

Table 1. Comparative analysis of the essence and significance of pedagogical values of future teachers

Author	Research results
R. Vynnychuk (2019)	➥ formation of intellectual skills of the individual through tasks that encourage penetration into the essence of phenomena, identification of their interrelationships, resolution of contradictions between personal experience and the values of society; ➥ the importance of certain values for the practical activity of a specialist; a meaningful approach to communication in the "person-to-person" system; ➥ dialogue training through the development of the ability to make contact, listen, penetrate the inner world of another person, understand each other, and restrain negative emotions; ➥ implementation of the system of values in the process of professional training, reflective analysis of own professional activity and solving situations of professional and communicative interaction.
N. Panchuk (2023)	➥ the main values of future teachers are personal values (health, family), material values (financially secure life), professional values (knowledge, social recognition (respect of others, team, colleagues), love for children, parents, self-improvement, communication skills, professionalism); ➥ the hierarchy of professional values includes: professional and pedagogical orientation of the future teacher's personality, his/her inner position, stable life views and professional beliefs.
S. Bilozerska (2021)	➥ academic values (institutional independence; fundamentalism; academic freedom; promotion of innovation; professional competence; new pedagogical and research paradigms; educational unity and research process; academic mobility; critical thinking); ➥ values of personal growth and well-being (self-determination; self-realisation; individuality; subject-subject relationship; continuity), education, professionalism of teacher's behaviour in the environment and specific (pedagogical) situations; mental, psychological, social, physical and spiritual health, competitiveness of the graduate); ➥ social values (freedom, democracy; openness; social justice; tolerance; ethics; cultural diversity; social responsibility; patriotism; civic consciousness; national character); ➥ organisational values (decision-making based on the consensus of opinions and interests; freedom to conduct research; technologicalization of educational activities; standardisation of the quality of education (educational programmes); material creation of value and knowledge; competitiveness of the HEI; availability of educational programmes for foreign students; strategic partnership of the university).
P. Zhigian (2019)	➥ values are objects of real life that are important for the fulfilment of personal needs and future professional activities: humanistic values characterise the teacher as a harmoniously balanced, highly moral personality: prognostic values are manifested in the teacher's ability to "see" pedagogical situations, identify them in the course of events of the pedagogical process, analyse and find the right solution; diagnostic values, in its turn, are related to learning psychological and characterological characteristics of students, their diagnosis of school readiness, study of the effectiveness of learning process based on changes in the level of moral development of the student, etc., analytical and evaluative values are manifested in the analysis of the pedagogical process, identification of its positive aspects and shortcomings, comparison and evaluation of results. The research values are the self-realisation of the teacher's creative potential, his/her uniqueness and the possibility of independent search.
N. Bezliudna (2023)	➥ promoting national consciousness and raising the level of patriotism among young people, encouraging students to develop national identity, citizenship and national self-awareness, the ideals of freedom and equality, awareness of the value of human dignity, building their own system of values, in which the main place will belong to the values of a higher spiritual level, namely national values.

Source: developed by the authors

Using the axiological approach, practical training was considered as a fundamental factor in the formation of professional values. This approach also helped to determine the place of pedagogical values in the paradigm of education and upbringing. The method of systematization was used to organize and summarize the main achievements of

leading scholars and interpreted in this study. The method of generalization was used to formulate and present the general conclusions of the study.

RESULTS AND DISCUSSION

Pedagogical values are a fundamental component of education and upbringing, they determine the direction of pedagogical activity and the relationship between the teacher and the student, because it is pedagogical values that reflect moral, ethical and psychological principles and determine the behaviour of the teacher in the educational process. These values are the basis of a successful educational system and determine how teachers contribute to the development of the younger generation, reflect the importance of this profession, its impact on society and its future. According to H. Mykhailyshyn & O. Kondur (2021), the value orientation of a teacher as a system of spiritual determinants and relevant socio-psychological formations is important in the educational sector.

The essence of pedagogical values lies in the ideals, beliefs and priorities that are determined in pedagogical activity in order to achieve certain educational, upbringing and socio-cultural goals. The formation of pedagogical values is reflected in various aspects, including relationships with students, ways of establishing cooperation, the use of teaching methods, adherence to ethical standards, etc. According to N. Samsonenko & O. Goncharova (2019), pedagogical values form the basis of a teacher's professional culture and determine the architectonics of the axiological fabric of the educational space. Scientists emphasise that values cannot exist separately from a person and are formed as a result of interaction between a person and the world. Universal values arise from this interaction, and pedagogical values are formed during the professional training of future specialists. This process contributes to their subjectivezation. The level of subjectivezation of pedagogical values determines the degree of personal and professional development of a teacher. The pedagogical values of future higher education teachers are an important component of the formation of a modern educational environment, as they determine not only the quality of education, but also the future society, as they reflect the deep influence of the teacher on students and the scientific community as a whole. Author T. Belan (2021) notes that a teacher is a carrier of spiritual, moral and professional values, because professional values form the basis of the motivational sphere of the teacher's personality, which determines the level and direction of his/her creative activity, is a leading component, the substantive basis of human life and his/her pedagogical activity. The key needs of future teachers are dedication to the learning and development of students and the realisation that their work is not only the transfer of knowledge, but also the formation of critical thinking, the development of creativity and the promotion of personal growth of students on the basis of individualised learning and personal example. Therefore, the pedagogical values of the future teacher of a higher education institution should be based on justice and responsibility, adherence to ethical standards, including ethics and honesty, professional competence and continuous self-improvement.

The training of future teachers of higher education institutions is focused on the awareness of the transience of time and, accordingly, constant changes in the system and content of education. That is why higher education staff should be prepared to update their knowledge and improve their professional skills: studying scientific achievements and applying innovative teaching methods; investing time and effort in supporting the development of students' intellectual and personal qualities; recognising the uniqueness of each student, taking into account their needs, individual characteristics and pace of learning. After all, the strategic objectives of the modern education system N. Bezliudna (2023) are to form the younger generation of universal human values, in particular, moral and ethical (justice, honesty, dignity, care, respect for oneself and other people, respect for life); socio-political (patriotism, national identity, freedom, democracy, respect and respect for the native language and culture, respect for the laws and the Constitution of Ukraine, solidarity, responsibility). Currently, the formation of pedagogical values is an important process, as these values determine the quality of education and training in universities and influence the future society. This process includes the following key aspects (Table 2):

Table 2. Aspects of the process of forming pedagogical values

Aspect	Description
Professional training	This includes receiving high-quality education in pedagogy and education science. This will help them understand the theoretical aspects of pedagogy and develop effective teaching methods.
Practical experience	Teaching, internships and pedagogical practices play an important role in the development of pedagogical skills and values. Interaction with students promotes partnership and tolerance.
Psychological training	Understanding the psychological aspects of teaching and learning is important for creating an effective pedagogical impact. Specialists should know the basics of higher education psychology.
Ethical and moral training	Faculty members should understand their role in educating students, adhere to ethical standards and demonstrate moral qualities in the educational process.
Mentoring and support	The involvement of experienced mentor colleagues and pedagogical resources contributes to the formation of pedagogical values. Their example is important for both teaching practice and personal development.
Systematic and purposefulness	The formation of pedagogical values is a long-term process that includes learning and personal development. It is important that this process is systematic and purposeful.

Source: developed by the authors

Pedagogical practise is a mandatory stage of professional training of higher education specialists and teachers, during which they gain practical experience in the field of teaching and education. This process allows students to apply their theoretical knowledge in the real conditions of educational institutions. After all, pedagogical practise, as depicted in the previous study by the authors of this article O. Serhiichuk & Y. Bahno (2021), is an important stage in the system of professional training of a future teacher, during which the foundations of professional activity are laid and the scientific and methodological skills of teaching, practical skills and abilities are developed, professional qualities of the personality are formed, and interest in the future profession is formed in the context of modernisation of national education. Researcher O. Serhiichuk *et al*. (2019) consider pedagogical practise as a mandatory component of the educational process of pedagogical universities. They define its role in the professional training of pedagogical staff and their professional development and consider it an important means of forming pedagogical values and preparing future teachers for professional activities. The main goals of the pedagogical practise, according to them, include: teaching students to use their scientific and theoretical knowledge and practical skills creatively in their teaching work; applying the knowledge and methods acquired at the university in practise; mastering modern methods and forms of organising the educational process in general education institutions such as gymnasiums, lyceums, colleges, etc; fostering interest in pedagogical activity and supporting the need for continuous updating of knowledge and its creative use in pedagogical work.

According to the authors, the competences of future higher education teachers (Fig. 1) in the process of pedagogical practise are to prepare for pedagogical activities that help students understand how to work with students, how to organise classes and how to educate their personality (deepening knowledge of ethical standards of behaviour of a higher education teacher, focusing on the modern needs of students, awareness of the need for technological and practise-oriented educational process). At the same time, mastering practical skills helps students to try out different methods and improve their teaching skills (introduction of modern pedagogical technologies into the educational process, observance of pedagogical tact, culture of behaviour, avoidance of conflict situations). Nevertheless, interaction with students and colleagues allows students to develop skills of communication, cooperation and interaction with students, parents and other teachers (pedagogical image, facial expressions and gestures, communication style, emotional colouring of communication: friendliness, coldness, loyalty, rudeness, etc.). Evaluation and reflection are important, as they encourage students to evaluate their work and reflect on the results in order to improve their teaching (analysing the results of their work, identifying positive achievements and reasons for unsolved tasks, modelling further actions to address shortcomings). Enrichment of pedagogical experience – provides students with the opportunity to learn from experienced teachers and educators, using their practical experience (imitation of the positive experience of teaching, interpersonal, scientific, methodic, methodological, organisational activities of higher education specialists).

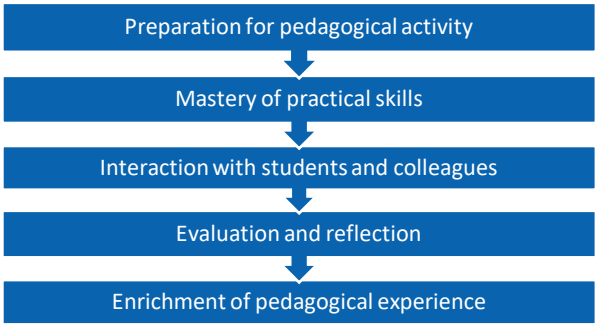

Figure 1. Competences of a future higher education teacher in the process of pedagogical practice
Source: developed by the authors

Pedagogical practise is highlighted as a key stage in the formation of future teachers and influences the formation of their pedagogical values. This stage provides students not only with the opportunity to interact with experienced teachers, but also becomes an arena for their own pedagogical experimentation and development. Practical experience gained while teaching and educating students is a step towards becoming a qualified teacher. This experience exposes future teachers to the real challenges and real situations that they will face in their professional work. In particular, studying the real challenges of teaching allows students to reflect on and adapt their knowledge to the real needs of the educational process. Experimenting with different methods and approaches in practical activities allows students to gain practical experience in applying theoretical knowledge. Interaction with mentors and experienced teachers becomes a source of valuable advice and recommendations that help to improve teaching skills and understand the individual needs of students.

An important part of the teaching practise is interaction and communication with students, which allows future teachers to develop skills of communication and interaction with different groups of students. Evaluation and correction of the teacher's work during the practise ensure the continuous development and improvement of their teaching activities (Regulations on Academic..., 2021). This comprehensive approach to pedagogical practise provides students with the opportunity not only to acquire theoretical knowledge but also to develop practical skills, which is a necessary element of the successful operation of a higher education institution. This practise helps to form not only professional but also value orientations in future teachers, which are necessary for high-quality education. Having considered the importance of pedagogical practise, it should be noted that it is the practical experience gained during the teaching and upbringing of students that

influences the formation of pedagogical values of future teachers. In this approach, pedagogical practise is an important step towards becoming a qualified teacher, as it provides an opportunity not only to establish interaction with experienced teachers, but also allows students to join the study of best pedagogical practises (Table 3):

Table 3. Types of activities of future teachers' students during their studies

Activity	Content of the activity during the teaching practice
Real-life teaching activities	Exploring the real-life challenges that higher education teachers may face in the course of their professional duties
Testing different methods and approaches	Experimenting with different teaching methods, tracking their effectiveness; adapting to the requirements of different students
Cooperation	Feedback from mentors and experienced teachers; advice and recommendations on how to improve their own teaching from experienced teachers; understanding the needs and individuality of students
Interaction and communication	Learn to interact with different student groups, understand their needs and requirements, develop pedagogical interaction and communication skills
Assessment and correction	Reflection, self-assessment of own teaching practice and improvement of their work
Practical implementation of theoretical knowledge	Test your knowledge of how theoretical concepts and teaching methods work in a real learning environment
Experimentation	Try different approaches to learning and gain experience of their effectiveness with learning strategies

Source: developed by the authors

Pedagogical practise opens up a unique opportunity for students-teachers to interact with real teaching activities, allowing them to feel the atmosphere of teaching and upbringing, as well as to gain invaluable practical experience. This stage of education becomes key in the implementation and application of theoretical knowledge in practise and can serve as a basis for the formation of pedagogical values of future teachers. During the teaching practise, students have the opportunity not only to observe the work of experienced teachers, but also to be actively involved in the learning process, putting their theoretical knowledge into practise. This contributes to their personal and professional growth. In addition, the teaching practise becomes a platform for testing different teaching methods and strategies. Students experiment with the use of modern pedagogical technologies, adapting them to the specific conditions and needs of students. Interaction with students and colleagues is also an important element of pedagogical practise. This allows students to develop communication skills, understand the individual needs of students and improve their interaction in the teaching process. Such a practical approach to the study of pedagogy not only contributes to professional skills, but also shapes the values of future teachers, they are able to independently determine their priorities, develop their own pedagogical style and manage their activities based on the knowledge and values acquired during practise. This stage of training allows not only to gain practical experience but also to implement theoretical knowledge in real life. Pedagogical practise becomes the foundation for the formation of values of future teachers. Table 4 shows the main learning outcomes after students have completed their teaching practise:

Table 4. Formation of competences and pedagogical values during pedagogical practice

Learning outcomes of pedagogical practice	Content of learning outcomes
Improving professional competence	The opportunity to gain experience in real pedagogical conditions, solve pedagogical problems and work with students, which helps to develop pedagogical skills necessary for effective work as a teacher
Development of communication skills	Communication skills with students, colleagues, and parents that promote values such as openness, tolerance, cooperation, and the ability to listen and understand others
Responsibility	Requires awareness of its role in the education and development of the younger generation, promotes the formation of values related to the duty to students, higher education institutions and society
Understanding the individual needs of students	The opportunity to get to know students better and understand their individual needs and characteristics helps to develop values related to an individual approach to learning
Formation of pedagogical values	Observation of how the pedagogical values of teachers are implemented in the educational process and outside it, in real life; formation of pedagogical values under the influence of the example of a teacher-mentor, supervisor, practice supervisor or other teacher who is a role model

Source: developed by the authors

The success of a teaching practise not only depends on the right choice of the practise site, but also on the effective implementation of advanced methods and techniques in real-life conditions. It is also important to raise the methodological level and skills of teachers who act as mentors. This approach is driven by modern requirements for higher education teachers, who must not only have fundamental knowledge but also be ready to implement innovative approaches to the organisation of the educational process. A key component of this process is the use

of innovative technologies, which requires teachers to master modern methods and skills (Fig. 2). In promoting the development of professional values, teachers should be guided by universal moral and professional values. This includes not only the technical aspects of teaching, but also the consideration of ethical aspects, which are formed through practical experience and interaction with students, colleagues and other participants in the educational process. The application of innovative approaches in teaching practise requires not only technical skills, but also flexibility of thinking and openness to continuous professional growth.

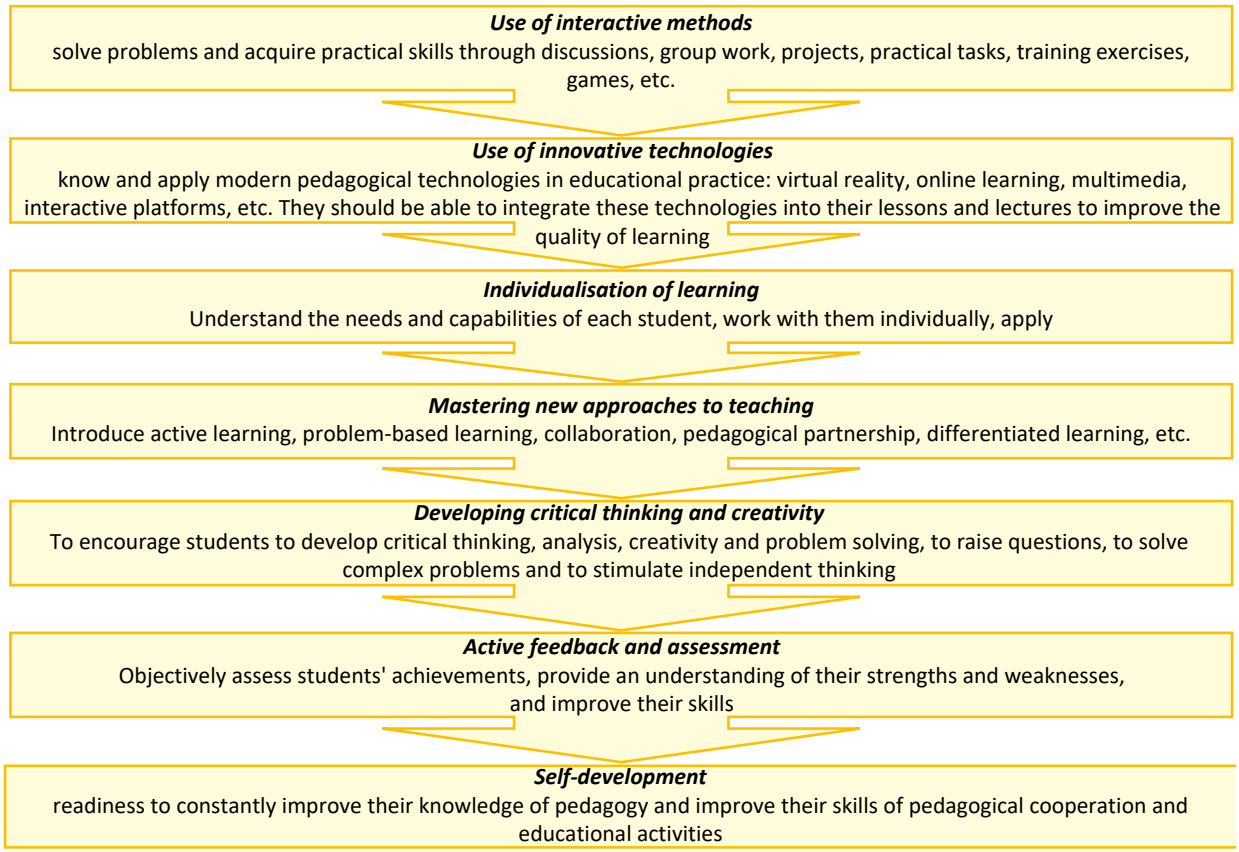

Figure 2. Main approaches to organizing student teacher education

Source: developed by the authors

Research practise as a form of educational work is aimed at deepening and consolidating the theoretical and practical knowledge gained by future masters of educational and pedagogical sciences in the process of studying, acquiring and improving the skills and abilities to conduct research on education and science (Benera *et al.*, 2021). It forms basic knowledge about preparation for writing a qualification paper, rules of working with different sources, peculiarities of borrowing and citing scientific and pedagogical works of scientists. Therefore, the basis of research practise is not only the acquisition of knowledge, but also the formation of pedagogical values in the future university teacher. The effective work of a higher education institution is based on the ability to adapt its pedagogical strategy to the individual needs and characteristics of students. An important component is also the interaction and exchange of experience between teachers, which contributes to the collective development and improvement of professional skills. Working in a team allows teachers to mutually enrich their knowledge, expand their horizons and implement best practises in their own activities. Success in teaching practise is not only based on the individual efforts of the teacher, but also on his or her ability to work in a team, using innovative methods and accepting the challenges of the modern educational paradigm. Adherence to the principles of academic integrity depends significantly on public policy and the definition of a system of social and cultural values. In an effort to maintain and improve their reputation, universities pay considerable attention to the implementation of academic integrity policies and principles; define the roles and responsibilities of both students and teachers; develop technologies for detecting and addressing academic integrity violations; and emphasise academic responsibility and the consequences of dishonesty (Duliba *et al.*, 2022).

In the study by O. Filonenko *et al.* (2021) based on statistical research, the authors conclude that pedagogical practise contributes to the improvement of students' self-esteem (from 7.6 to 8.7 on a 10-point scale) and the

formation of a positive attitude towards the teaching profession (42.7% of the surveyed students have a more positive attitude towards the profession). For example, M. Vovk *et al*. (2023) emphasise the importance of studying the best practises of pedagogical activities of teachers of Ukrainian and foreign higher pedagogical educational institutions in the process of training master's students. Scientists emphasise the creation of high-quality methodological support for the practical training of masters through the use of innovative forms, author's teaching methods and the introduction of pedagogical technologies through their adaptation to the mixed and distance format of the educational process in higher education. M. Artyushina & O. Sarkisova (2018) note that pedagogical practise is a fundamental part of the entire process of practical training, as it introduces the forms and methods of teaching and the development of pedagogical abilities of students through independent development of classes and their conduct, organisation of consultations and improvement of methodological work.

The staff of Hryhorii Skovoroda University in Pereiaslav shares and supports the generally accepted policy of academic integrity and encourages participants in the educational process to adhere to its basic principles on the way to publishing the results of the research of qualification work of higher education applicants (Regulations on qualification..., 2020). Thus, pedagogical practise acts as a laboratory for the formation of pedagogical values of future teachers, where they can develop their skills and professional identity in a real learning environment; it allows future teachers to immerse themselves in the world of real teaching, develop skills and values necessary for a successful career in education. Given the above, it can be argued that pedagogical practise includes a number of requirements that play a key role not only in the process of professional training, but also in the formation of values. Thus, in the process of active observation of the work of experienced teachers, students analyse their approaches to teaching and teaching methods, which allows them to learn the best pedagogical practises used in the real learning environment.

In addition, teaching your own classes gives you the opportunity to plan, interact and perform the role of a higher education teacher, and thus receive feedback that helps you develop your own pedagogical skills and responsibility for teaching your own classes. Joint discussion of pedagogical issues with other students and teachers can contribute to a deeper understanding and improvement of one's own pedagogical beliefs and personal and professional values. Regular reflection on pedagogical practises provides an opportunity to analyse, develop tolerance, the ability to adapt approaches and work with different groups of students, taking into account age, socio-cultural contexts and individual characteristics, based on the value of diversity. It is important for future teachers to take part in internships at different educational institutions and join teaching teams where they can share experiences and receive constructive feedback. Non-formal education is an important aspect in the professional self-improvement and development of higher education students. Under such conditions, it creates a holistic approach to the formation of pedagogical values and the training of qualified teachers who understand the importance of values in the educational process and can put them into practise, provides an opportunity to practically implement and enrich the acquired theoretical knowledge, develop the necessary pedagogical skills and foster values that are key to successful teaching.

CONCLUSIONS

The generalisation of the study allows us to state that practical training is an important component in the formation of professional and pedagogical values of future teachers of higher education institutions, as they determine the teacher's attitude to his/her profession, determine the nature of relations with students, determine the style of behaviour and the choice of methods and approaches to teaching. It should be noted that such values of future teachers include: tolerance, responsibility, pedagogical culture, respect for the individual and his/her work, openness, acceptance of other points of view, constant self-confidence, etc. Therefore, the process of their formation should begin not only during the internship period, but from the first year of future teachers' professional training and be embedded in all aspects of the educational process, including education, internships, practical activities and work with supervisors. In view of this, educational and professional programmes should be innovative and focused on the modern requirements of the time, include opportunities for developing professional competence, improving the skills of organising cooperation, pedagogical partnership, evaluating one's own performance and readiness for feedback.

In general, the process under study is complex and multifaceted, requires special attention, resources, provides an opportunity for future teachers to gain practical experience, develop the skills necessary for successful work in higher education and is key to ensuring quality higher education and the development of modern society. At the same time, practical training allows future teachers to master teaching methods, form their unique pedagogical philosophy and develop personal strategies for interacting with students; practically apply the theoretical knowledge gained during the study of educational components and contributes to the development of skills to solve pedagogical problems in real conditions; contributes to the formation of personal qualities of future teachers, such as empathy, tolerance, ability to cooperate and ability to work in a team. These qualities are important in pedagogical activity, as they contribute to building positive relationships with students and help to create an effective learning environment; form pedagogical values, the need for personal growth and the development of the necessary competences for successful teaching. However, this study does not reveal all the features and possibilities of pedagogical practises in the system of training of higher education specialists, which calls for further study of its potential in this area.

ACKNOWLEDGEMENTS

We express our gratitude to the Hryhorii Skovoroda University of Pereiaslav, represented by the rector and the entire university administration, who always contribute to improving the conditions of the educational process in accordance with the challenges of the times, paying attention to the creation of modern educational classrooms, providing them with modern technical equipment (computers, multimedia technologies, interactive whiteboards, marker boards, etc.), which facilitated the study.

CONFLICT OF INTEREST

None.

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Практична підготовка як основа формування професійних цінностей майбутніх викладачів закладів вищої освіти

Анотація. Сучасні умови розвитку вищої освіти та відповідно зміни ролі викладача у цьому процесі зумовлюють потребу удосконалювати систему підготовки майбутніх викладачів закладів вищої освіти та розвивати у них не лише професійні, інтелектуальні, моральні, соціальні навички, а й спонукати їх до саморозвитку, самовиховання, самовдосконалення, як прояву ціннісного ставлення до виконання професійного обов'язку, що й спонукало до здійснення проведеного дослідження. Метою статті було дослідження й аналіз ролі педагогічної практики у формуванні педагогічних цінностей майбутніх викладачів закладів вищої освіти. У статті використані методи аналізу, компаративний метод та систематизація для розгляду наукових підходів, а також узагальнення. У ході дослідження були визначені теоретичні підходи формування педагогічних цінностей; було здійснено класифікацію педагогічних цінностей, зокрема: цінності, що пов'язані з особистісно-мотиваційною сферою педагога, цінності, що відображають аспекти керівництва освітньою діяльністю; було наголошено на важливості впровадження нових підходів (активне навчання, проблемне навчання, співробітництво, педагогічне партнерство, диференційоване навчання) до організації освітнього процесу та впровадження інноваційних технологій на засадах педагогічних цінностей (загальнолюдських моральних та професійних цінностей). Практичне значення роботи полягає у тому, що результати можуть бути використані викладачами закладів вищої освіти в процесі професійної підготовки, оскільки в цьому процесі закладаються основи професійної діяльності майбутніх педагогів, які володіють науково-методичною майстерністю викладання, практичними уміннями і навичками, формуються професійні якості особистості майбутнього педагога спрямовані на закріплення та реалізацію набутих здобувачами освіти предметних, психолого-педагогічних, методичних знань, умінь та навичок, а з іншого – як засіб творчого розвитку та саморозвитку майбутнього викладача закладу вищої освіти; також при написанні кваліфікаційних робіт, організації педагогічної практики у вищій школі, процесі самовдосконалення педагогічних працівників

Ключові слова: педагогічна практика; вища школа; здобувач вищої освіти; компетентність; компетенція; викладач вищої школи; педагогічні цінності

Vol. 2. No. 2. 2023 Scientia et societus
Received: 18.08.2023.
Revised: 17.11.2023.
Accepted: 12.12.2023.
Journal homepage: https://ses.journal.in.ua/index.php/ses/issue/view/4

UDC 378.016:91]:374.7-022.316 *DOI: 10.69587/ss/2.2023.73*

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Practical training of future teachers for innovative activities: International experience

Abstract. One of the joint tasks of the global educational space is the high-quality practical training of teachers with formed modern professional competences based on theoretical knowledge, acquired during studies in Higher Education Institutions, the ability to creatively implement them and carry out innovative professional activities, effectively using the latest technologies training, all this strengthens the role of pedagogical practice as a certain means of achieving effective results. The purpose of the article was to analyze, justify and generalize the foreign experience of practical training of future teachers for innovative activities. Theoretical methods were used, such as the analysis of the practical training of future teachers abroad, generalization of the obtained data in order to determine the state of their practical training. The article analyzes and summarizes the experience of economically developed countries (Great Britain, the USA, Germany, Japan, France, Denmark, Austria, the Netherlands) and countries with a transition economy (Greece, Ireland, Portugal, Poland, Hungary) regarding the practical training of future teachers to innovative activity. The general specifics of pedagogical practice in these countries have been clarified (the active use of innovative information and communication technologies; a large amount of independent training of students and the wide terms of practice in General Secondary Education Institutions; the transfer of partial responsibility for practice from Higher Education Institutions to General Secondary Education Institutions; the improvement of coordination between Higher Education Institutions and General Secondary Education Institutions; the provision of payment and bonuses to teachers responsible for practice, together with benefits during certification, professional psychological and pedagogical assistance and methodical support; taking into account new requests of society to teachers). The experience of Ukraine is highlighted on the example of Hryhorii Skovoroda University in Pereiaslav. It is noted that in Higher Education Institutions of Ukraine and abroad a pedagogical practice is a leading factor in self-improvement and self-development, creative self-realization in pedagogical activity, increasing the levels of professionalism and pedagogical skill of future teachers. Methodological recommendations for conducting pedagogical practice are proposed, which take into account global trends and can be implemented in pedagogical Higher Education Institutions of Ukraine with the support of General Secondary Education Institutions in order to improve the practical training of future teachers for innovative activities

Keywords: economically developed countries of the world; countries with a transition economy; pedagogical practice; innovations; higher education; future pedagogues

Suggested Citation:
Onyshchenko, N., & Serdiuk, N. (2023). Practical training of future teachers for innovative activities: International experience. *Scientia et societus*, 2(2), 73-83. doi: 10.69587/ss/2.2023.73.

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INTRODUCTION

In the global educational space, high-quality practical training of teachers with developed modern professional competences is an important task of higher education institutions, and pedagogical practice is a means of achieving effective results. Future teachers should not only acquire theoretical knowledge during training, but also be able to apply it in practice creatively and carry out innovative professional activities, effectively using the latest learning technologies, which, in particular, is emphasized in the Strategy for the Development of higher education in Ukraine for 2022-2032 years (Strategy for the development..., 2022).

According to scientists L. Lukianova *et al.* (2023), pedagogical practice takes place continuously, contributes to the development of vocational competences, becomes a system-forming component of the future teachers vocational training, promotes the improvement of their skills in the organization of learners' training and extacurricullar activities, enrichment of their value attitudes, their personal, professional development and self-development, and contributes to the formation of an individual style of future vocational activity. The future teachers training in different countries of the world is studied by Ukrainian scientists. N. Nychkalo *et al.* (2021) determine that in most countries a teacher training is carried out at the levels of higher education (bachelor, master, doctor of philosophy); in Great Britain and Hungary, primary school teachers have the right to start a teaching career after completing their bachelor's degree; in Germany, Finland, China, Australia, a master's degree is a mandatory condition for teaching at a school. Researchers L. Lukianova *et al.* (2023) point out that in European countries, pedagogical practice is an extremely important stage of vocational teacher training. In foreign countries, the terms of passing a pedagogical practice have been increased; great attention is paid to its qualitative methodical support. In most of the developed countries of the world, the grade for practice is equal to the grade for the final exam.

According to the research of L. Diachenko & M. Marusynets (2021), during pedagogical practice in Germany and Austria the significant emphasis is on the reflection of the trainee students' individual experience (which enables future teachers to analyze their own abilities and determine the prospects for further professional development), the introduction of components of practical training during studying (which made it possible to strengthen ties between the higher education institution (hereinafter – HEI), the center for practical training of teachers and the general secondary education institution (hereinafter – GSEI), and the quality of pedagogical support during practice. In the work of L. Nos (2019) the organization and conduct of pedagogical practice in Canadian and British HEIs are analyzed, the work of the Undergraduate Student Service (a special department that deals with the organization of pedagogical practice in Canadian universities) is described, as well as the clear organization of pedagogical practice management in British universities. Also the work of L. Nos (2019) suggestes opportunities for using foreign experience to improve the practical training of future teachers in Ukraine, but the study does not sufficiently take into account their readiness for future vocational innovative activities.

According to the research of A. Bitel *et al.* (2021), current regulations in Poland require pre-service teachers to undergo practical training (in pedagogy, psychology and teaching methods, as well as in a discipline relevant to the subject they plan to teach), during which they observe, assist, plan and lead teaching in classrooms during visits to local schools. Besides this before starting to teach, future pre-school and primary teachers must obtain at least the first, second or extended cycle degree, secondary school teachers must obtain the second or extended cycle. However, the study doesn't pay attention to the pedagogical practice specificity through the prism of constant innovations in education and challenges to the competencies of a future teacher. Scientists J. Daemen *et al.* (2020), researching pedagogical practice in the Netherlands, focus on its scope (during a study year, a student intern conducts 6-8 lessons per week by himself/herself) and tasks (preparing for lessons, conducting them and giving grades, participating in staff meetings, attending reporting meetings, mantaining contact with students' parents, performing several other actions such as designing educational products or contacting support service personnel, etc.), which show the importance of increasing the level of independence of HEI students and their close connection with an administration, the GSEI staff and students' families, as well as of speeding up the professionalization of student interns through full immersion and transferring certain responsibilities to GSEI, in particular regarding their support, etc.

In Germany, great importance is attached to mentoring during teaching practice. For example, scientists F. Führer & T. Falcone (2023) in their study consider the forms of school mentoring, focus on the quality of supervision and relationship between a mentor and a student at the practical stages in the school. The authors of the study give an example of educational practice (Lehr: Werkstatt., n.d) of the University of Tübingen, in the program of which mentoring during the whole academic year plays an important role in the development of future teachers professional competences. In their study, it is stated that such practice focuses exclusively on the pedagogical actions of future teachers (without paying attentiong the fact that professionalization processes can be long, non-linear and characterized by crises and interruptions), and the role of mentoring in improving the quality of education can only be indirect, which requires tutors to provide additional support in the form of numerous references to research in the subject sciences, subject didactics and pedagogical sciences, thus taking into account the results of recent research in the field. All the above-mentioned scientists made an undoubted contribution to the solution of the research problem, however, in the conditions of the European integration of Ukraine

into the world educational space, it is relevant to study the foreign experience of future teachers practical training for innovative activities, which contributes to the determination of the peculiarities of pedagogical practice in HEIs of different countries for the further implementation of positive ideas of this experience into the higher education system of Ukraine. The purpose of the article was to analyze, substantiate and generalize the foreign experience of future teachers practical training for innovative activities.

MATERIALS AND METHODS

The theoretical methods, namely the analysis of practical training of future teachers in economically developed countries and countries with a transition economy, practice programs in higher education institutions of Ukraine, generalization of the obtained data, in order to determine the state of future teachers practical training were used in the research. The studied data are presented by country and source in the table below (Table 1).

Table 1. Countries and sources for the study of their experience in the practical training of future teachers

№	Country name	Type of country		Sources used in the study of the country's experience
		economically developed	transition economy	
1.	Great Britain	+	-	L.S. Nos (2019); N. Nychkalo *et al.* (2021)
2.	the USA	+	-	L. Sukhenko (2019); M.T. Tatto (2021)
3.	Germany	+	-	F. Führer & T. Falcone (2023); J. Schneider & C. Cramer (2020)
4.	Japan	+	-	T.M. Desiatov (2019); L. Sukhenko (2019);
5.	France	+	-	T.O. Saltykova (2021)
6.	Denmark	+	-	L. Madsen & E. Jensen (2023); A. Rolliak (2020)
7.	Austria	+	-	L.M. Diachenko & M. Marusynets (2021)
8.	the Netherlands	+	-	J. Daemen *et al.* (2020)
9.	Greece	-	+	O. Protsenko (2021)
10.	Irland	-	+	O.A. Lysenko *et al.* (2020)
11.	Portugal	-	+	T.O. Piontkovska (2022); D. Soares, *et al.* (2019)
12.	Poland	-	+	A. Bitel *et al.* (2021)
13.	Hungary	-	+	K. Hodlevska (2022)

Source: developed by the authors

Theoretical analysis of practice in economically developed countries and countries with a transition economy made it possible to determine the most effective and innovative methods of teacher training. Consideration of other education systems provides an opportunity to take into account the best experience and borrow it to optimize the Ukrainian teachers practical training. *Analysis of practice programs in Ukrainian institutions of higher education*. The theoretical approach made it possible to study in detail the existing practice programs in higher educational institutions of Ukraine. This included a thorough review of the documentation, regulations and official regulations governing the practical training process. *Generalization of the obtained data.* The theoretical analysis made it possible to structure and summarize the information related to the practical training of future teachers. This helped to highlight key trends, problems, aspects of effectiveness or shortcomings in existing programs. The theoretical method in the study of practical training of future teachers was chosen due to its possibility of systematic analysis, study of existing theoretical foundations and legal acts, as well as for generalization and structuring of the obtained data for further conclusion and development of recommendations for improving the system of practical training of teachers.

RESULTS AND DISCUSSION

A significant source for forming the strategy of reforming the practical training of future specialists in Ukraine is the experience of economically developed countries of the world (such as Great Britain, the USA, Germany, Japan, France, Denmark, Austria, the Netherlands) and countries with transition economies (Greece, Ireland, Portugal, Poland, Hungary) regarding the practical training of future teachers for innovative activities.

Experience of economically developed countries of the world. The study of the practical training of future teachers for innovative activities in the economically developed countries of the world began with the analysis of the experience of **Great Britain**. The pedagogical practice there consists of block practice, serial practice no less than at two GSEIs and constitutes 25% of the total educational time of training students of the first (bachelor) level of higher education. Serial practice of higher education applicants has a duration of three years, particularly two times a week without breaking away from the educational process. This type of practice is aimed at awareness of the educational process at GSEI, studying the characteristics of the class, observing the work of the teacher, recording observations in the pedagogical diary etc. Passive practice gives the HEI student the

opportunity to understand the specifics of work in an educational institution, observe the educational process, and draw conclusions. The 25-week block practice takes place apart from studies (Nos, 2019). In HEIs in Great Britain, teaching practice lasts a year, its important part is implemented in the last year of study, and consists of an introductory practice (at the 1st year of study students familiarize themselves with the peculiarities of the teaching profession and make sure that their choice of profession is correct); internship practice (attending lessons taught by experienced teachers); production practice (independent lessons).

In the 1st year, applicants are required to visit a GSEI ten times for half a day, and 10 full days in the 2nd year. From the beginning of the fifth academic semester, the applicants are required to undergo a two-week teaching practice as a teacher's assistant at their place of residence. Practice can be completed both at basic GSEIs, which are the part of university complexes, and at educational institutions at the place of residence. Student interns receive a schedule of classes (drawn up by HEI teachers, managing the practice), attend and conduct lessons, the last of which are open lessons (at the end of the internship), to which the teachers of GSEI and the representatives of the scientific and methodical division of HEI are invited. Also, in Great Britain, students of the last study year in HEI (under the control of inspectors of the Ministry of Education and Science) undergo a one-year internship at the place of employment, followed by a conclusion on the feasibility of the intern involving in practical activities in the field. Thus, students of higher education in Great Britain undergo pedagogical practices within the framework of vocational teacher training, taking into account the rights, tasks and responsibilities of all interested parties (student interns, GSEIs, higher schools or HEIs). It is noted that in Great Britain, according to the system of selection of candidates for teacher training programs, applicants must provide information about the completion of introductory practice in the GSEI lasting at least 10 days, which precedes admission to teacher training programs in order to determine the main teacher's functions and the peculiarities of the teaching profession (Nychkalo *et al.*, 2021).

In **the USA** an important stage of higher education is a fieldwork, that is a pedagogical practice divided into such varieties as field observations, student teaching or internship, during which future teachers have the opportunity to observe the educational process, offer original ideas for its modernization (meetings to improve the work of the GSEI, study groups, school teachers' councils, etc.). There are differences in the practical training of future teachers provided by the programs of different universities in the U.S. This is explained by the significant differences in the basic teacher training programs between the states of the USA. Most universities train teachers at the faculties of humanities or natural sciences at the level of a Bachelor of Pedagogy, in 4-year programs. Vocational and pedagogical training in pedagogical colleges is carried out in the third and fourth years of study. The practice lasts an average of 6 to 8 weeks in a traditional 4-year training program and falls on the final year of study. A number of universities have switched to 5-year training programs at the level of a Master of Education, taking into account modern initiatives of national commissions aimed at reforming teacher education and providing for a 1-year internship in educational institutions of an innovative type, which are professional development schools (hereinafter – PDS).

The practical training of future teachers in PDSs is significantly different from traditional school pedagogical practice. In PDSs, the training program for future teachers is developed and implemented jointly by teachers of general secondary education institutions and college teachers based on the technology of a partnership between a HEI (center of theory) and a GSEI (center of practice), which ensures the elimination of the gap between theory and practice in the professional training of teachers. Differences in the training of future teachers according to different programs relate to the following aspects of the problem: practical training of students in programs involving PDS begins much earlier than in a traditional 4-year study, and also continues throughout the year, but generally teacher education provision in the U.S. is highly variable (Tatto, 2021). Students-future teachers are organized into PDS cohorts, where they have opportunities to gain different professional experience, namely: in schools of large cities and in rural areas, in recreational classes; organization of mentoring not by an individual teacher, but by a whole team (pedagogical practice instructors, full-time school teachers, university teachers, etc.); responsibility for the internship of students as future teachers and the team of mentors as active subjects of the educational process.

In the U.S., much attention is paid not only to the training of teachers, but also to their selection and further development (Sukhenko, 2018). The analysis of the results of the work of USA teachers makes it possible to conclude that the graduates of teacher training programs who have undergone practical training in PDS differ from ordinary graduates who studied according to traditional programs and went through practice in ordinary schools, with a higher level of readiness for professional activity (have more confidence in acquired knowledge and skills, as professionals in the field of pedagogy; use more diverse pedagogical methods and technologies; are more inclined to reflect on their own activities; are better prepared to teach ethnically and linguistically entertaining groups of students; are familiar with the extracurricular work of students; are more adapted to pedagogical activities; are not afraid work in GSEIs in large cities; less often leave the teaching profession during the first few years of work in GSEI; work productively at the workplace and quickly adapt to the staff of the educational institution).

In **Germany**, pedagogical practice is called "referendariat" and lasts for 2 years. After passing it, the applicant of higher education is admitted to the final state examination. During the course of pedagogical practice, applicants receive high-quality practical experience, based

on classes in pedagogical educational components and orientation to work in GSEIs. Pedagogical practice in Germany provides integration with the theoretical training of future teachers, has a certain sequence, functions and types, while the responsibility of HEIs for school practical stages is limited, depending on the federal state and the course of study, etc. (Schneider & Cramer, 2020). All types of practice are fixed in certain modules and are aimed at improving the theoretical knowledge, skills and abilities acquired during training. Thus, in German HEIs, pedagogical practice is divided into didactic (Wissenschaftspraxis, which is conducted in HEIs and is based on theory, ensures the connection of theory and practice with professional training, aimed at the development of the student's creative personality) and school (Schule verortete Berufspraxis, which is conducted in GSEIs and helps to get the first personal experience).

The goal of pedagogical practice is to increase students' motivation to study; to prepare teachers who would meet the requirements of a modern GSEI. In Germany, there are the following forms of pedagogical practice: Blockpraktika lasting 4 weeks (the preparation of lessons and their further discussion takes place in the pedagogical disciplines and their methods, applicants attend classes in their free time from classes); Tagespraktika (the preparation of lessons and their discussion is carried out in classes on pedagogical educational components and their methods, attending classes takes place in parallel with classes during the semester or after graduation). Student interns conduct classes in GSEIs, get acquainted with school life and master the methodology of teaching school subjects. Future teachers are taught by professional methodologists, seminar leaders who have a certain number of hours in GSEIs, and a mentor; in paralel mentoring in German HEIs is considered as a tool with which practical and pedagogical action, as well as scientific and reflexive thinking, can be supported and stimulated, in the sense of a guided and supported professionalization process that goes beyond the simple transfer of (experimental) knowledge (Führer & Falcone, 2023). After completing the practical training, the university graduate takes the second, practical, state exam, the successful passing of which gives him/her the opportunity to obtain the position of assistant teacher at a GSEI and work under teacher mentoring for two years. The system of practical training of future teachers in HEIs of Germany has certain shortcomings, including the autonomy of practical training of applicants, the impossibility of effective management of pedagogical practice (due to the subordination of the preparatory service to local education authorities and the distance from HEIs), which leads to a gap between theoretical and practical training of specialists.

Pedagogical practice in **Japan** is a mandatory condition for obtaining a teacher's certificate. In Japanese universities, before teaching practice, lectures and seminars are held, where applicants of higher education are introduced to the methodology of conducting various types of lessons, effective selection of educational materials and their visibility, etc. After choosing an GSEI for practice, orientation interviews are held with student interns regarding the plan of pedagogic practice, the schedule of lessons in the educational institution, methods of teaching subjects, provision of textbooks and other teaching aids, characteristics of the class, features of the location of the GSEI. Applicants undergo pedagogical practice for 4-8 weeks under the guidance of teachers from these schools. After completing the practice, students must write letters of thanks to the school for help in organizing and conducting pedagogical practice. From 2 to 6 weeks are allotted for pedagogical practice, the basic institutions are schools attached to universities (Desiatov, 2019). Because of such a small practical component, there are difficulties in providing practice for a large number of students in Japan. HEIs in Japan are solving this problem by expanding the network of basic GSEIs.

It is interesting for this research to study the experience of practical training of future teachers in **France**, where as early as the 1st year, applicants of higher education undergo an internship, observation and practice with accompaniment (*Le stage d'observation et de pratique accompagéale*) lasting 6 weeks. In the 2nd year of study, the periods of study and teaching practice alternate, and the total duration of the internship is 12 weeks. The second internship is paid and takes place under conditions of mixed leadership: two mentors (a school teacher and an HEI teacher) provide applicants with practical help and evaluate their activities. Scientist T. Saltykova (2021) notes that the practical training of French teachers is carried out by a multi-disciplinary and multi-institutional team of teachers of HEIs, scientists, employees of the national education system and accredited partner associations of GSEIs, teachers of GSEIs, etc., while almost 1/3 of practical training is carried out practicing teachers who have the status of civil servants.

The plan for the pedagogical training of teachers in **Denmark** is determined by the Ministry of Education, although there is no single centralized program of the training course. The courses are divided into two parts lasting for two years. The first course is represented by a wide range of pedagogical subjects common to all students; the second year is represented by two selected subjects at the academic level, as well as pedagogical subjects. School practices make up a significant part of the teacher training program, about 10% of classes in the first cycle of the course and 15% in the second. Students receive many tasks in the process of school practices. The most important ones include: familiarization with the functions and organization of the GSEI, the nature of the teacher's work, the principles of cooperation with parents, learners, as well as with planning and evaluation of the learning process. During practice, student interns learn not through the imitation of a learning model or acceptance of certain recommendations, theories and ready-made solutions, but through a discussion about what they have done or plan to do in an educational institution. Pedagogical practice in Denmark helps to obtain the qualification "teacher of a public school" or "teacher of a Danish school with a higher level of secondary education".

After completing the practice, future teachers receive a certificate "On Pedagogical Practice" as a mandatory supplement to the GSEI teacher's diploma, without which a teacher cannot carry out professional activities in Danish GSEIs. In general, the educational program in colleges and universities in Denmark consists of four main blocks: 1) subjects from the general theory of education, psychology and pedagogy; 2) citizenship/life; 3) two or three specialized subjects; 4) pedagogical practice (Rolliak, 2020). Scientists L. Madsen & E. Jensen (2023) consider the development of even better models of integrated practice, models of internship and cooperation to be important for strengthening cooperation between schools and pedagogical education.

Pedagogical practice in **Austria** is of a continuous nature, which provides for students' confirmation of the GSEI during the entire period of study at the HEI. Applicants undergo an internship (Unterrichtspraktikum) under the supervision of the local education authority in cooperation with the regional institutes of postgraduate education (Pedagogische). Students majoring in pedagogy undergo practice as part of the annual "induction phase", which is managed by a teacher-methodologist. This phase of training ends with a state exam, after which graduates receive a teacher's qualification. Scientists such as L. Diachenko & M. Marusynets (2021) see the positive experience of training future teachers in Austria in the implementation of training for students of higher education in European countries; the extension of pedagogical practice terms due to reduction of time for theoretical training; the introduction of introductory pedagogical practice into the curricula of HEIs in the first weeks of training of applicants. According to the authors' opinion, the use of precisely these aspects of the Austrian experience of practical future teachers training in the system of higher education of Ukraine will contribute to increasing the effectiveness of training future specialists.

According to the research by scientists J. Daemen *et al.* (2020), in HEIs in **the Netherlands** a practice-oriented approach is used during the formation of the competence "knowledge of the subject and didactics of the subject". About 25% of the educational program is devoted to pedagogical practice in the process of teaching bachelors. In particular, students are invited to make several video recordings of their lessons during pedagogical practice (choose fragments when they work with one or more students of the class), then choose two video fragments (one fragment with interaction, where the future teacher is satisfied with the result of his activities with students, and the one where he/she is less satisfied with his work) and conduct a pedagogical analysis of both fragments.

Experience of countries with transition economy. In the context of the study, the practical training of future teachers for innovative activities in countries with a transition economy was considered: Greece, Ireland, Portugal, Poland, Hungary.

In particular, pedagogical practice in **Greece** is mandatory and is part of such educational components as: theory and practice, didactic methodology, general and special didactics, etc., which involves the connection of theory with practice. There are also post-doctoral studies in Greece, which are carried out in HEIs by scientists with the Doctor of Philosophy (PhD) degrees and aimed at financial and professional support of modern researchers, addition and expansion of existing scientific achievements, formation of scientists' research competence, implementation of innovative achievements and research results, formation of a positive image of HEIs with further international recognition of the research conducted in them, etc. (Protsenko, 2021). In Greek higher education, the peculiarities of pedagogical practice are: theoretical and methodological training of future teachers in HEIs, training on planning the educational process; performing the duties of a teacher for a period of 1 to 4 weeks; discussing, analysing and evaluating pedagogical practice in GSEIs, attending classes there and pedagogical observing the educational process; conducting trial lessons, visiting various types of GSEIs (of small-class, educational institutions for children with special needs, etc.), preparing a scientific project based on the results of practice. In Greek academies, practice is mandatory and is conducted according to a single program developed and approved by the Ministry of National Education and Religion. Greek teaching practice has the following types: trial lessons, pre-diploma teaching practice, observation practice. Pedagogical practice lasts from 3 to 4 semesters and consists of 3 or 4 stages. Greek HEIs do not provide such types of pedagogical practice as are available in Ukrainian ones (summer practice in children's health facilities, extracurricular educational practice, practice of a child's first days at school), but such forms of pedagogical practice as conducting practice in special and small-classes educational institutions, preparation of scientific work, activities in the pedagogical laboratory.

Practical training of future teachers in **Ireland** takes place in individual or group forms on campuses during practical-seminar classes, lesson simulations, followed by evaluation of the work of not only applicants, but also teachers of HEIs. A type of practical training for future Irish teachers is an educational practice in those vocational schools where the applicant plans to work in the future. During the educational practice, at first the applicant is an observer of the educational process of GSEI, and then an active participant under the guidance of qualified teachers. In Ireland, teaching practice is an important element of the practical training of future teachers, where experienced teachers provide direct assistance to candidates. For the successful implementation of practice, it is important that Irish HEIs properly organize the preparatory stage, during which appropriate consultations are held regarding the purpose, requirements, structure and reports of pedagogical practice. Teachers involved in practice are required to complete appropriate professional development courses (Lysenko *et al.*, 2020).

In the context of this study, the practical training of future teachers in **Portugal**, which begins already in college with modeling lessons, conducting practical

classes by students in groups or individually, deserves attention (Soares, *et al.*, 2019). The results of the classes are discussed not only by the head teachers, but also by the students who attended the class. The purpose of such classes is to prepare and inform student interns about possible problems that arise in the process of pedagogical practice in GSEI. The next step in the students' practical training is pedagogical practice, which takes place in the GSEI where the future teacher wants to work after receiving a diploma. It is usually supervised by a qualified teacher who has a positive characteristics and a positive reputation (Piontkovska, 2022). At first, the student intern only observes the teaching process carried out by the teacher, then gradually becomes involved in the implementation of individual elements of the lesson, for example, checks homework, gives advice on how to perform this or that task, etc.

In **Poland** the practical training of future teachers involves subject-methodical (preparation of didactic materials for conducting lessons, preparation of educational documentation) and assistant (passive-assistant/propaedeutic, assistant-teacher) practices. In Polish HEIs, according to educational programs, teaching practice begins in the first or second year, its duration is 8 weeks. The peculiarity of Polish teaching practice is that the applicant of higher education is obliged to undergo teaching practice only in the city where the HEI is located in order to effectively control by practice manager-methodists. The period of practice in pedagogical HEIs of Poland is divided into preparatory, main and final stages (Bitel *et al.*, 2021). At the preparatory stage the programs of pedagogical practices are developed, the experienced teachers are appointed as managers (guardians) of pedagogical practices, and the contracts with educational institutions are signed. At the beginning of pedagogical practice, future teachers are given an introductory briefing and familiarized with the requirements of keeping reporting documentation and performing individual tasks. At the main stage of pedagogical practice, teachers-guardians contribute to the quality of practice, monitor the performance of interns' duties. At the final stage of pedagogical practice, future teachers report on pedagogical practice and, subject to a successful report, they are credited with passing pedagogical practice with a certain grade (5 – "very good"; 4.5 – "good with a plus"; 4 – "good"; 3.5 – "enough with a plus"; 3 – "enough"; 2 – "not enough").

In **Hungary** 10-12 credits (150 h) are allocated to school educational and pedagogical practice. Among them, student interns spend at least 90 hours at the GSEI under the guidance of teachers and mentors, participating in general and professional pedagogical practice. 15 hours are allocated for individual teaching practice, after which interns conduct demonstration lessons, which are evaluated by teachers of HEIs. It is worth noting that the practical training of future teachers in Hungary is carried out on a partnership basis between institutions of higher and general secondary education. Only those specialists are involved in the management of pedagogical practice who have successfully completed the relevant accredited training courses for training managers (mentors) of pedagogical practice. General practice is carried out only after the teaching methodology of the profiling educational discipline has been successfully developed. In the process of pedagogical practice, the applicant writes a journal of observations, takes an active part in the educational process of the educational institution. At the final stage of pedagogical practice, future teachers undergo individual practice under the guidance of pedagogical practice leaders, receive consultations from teachers of HEI (Hodlevska, 2022).

General specifics of pedagogical practice in developed countries of the world and countries with transition economy. On the basis of the analyzed experience, the peculiarities of pedagogical practice are determined, in particular:

- active using of innovative information and communication technologies during pedagogical practice;
- allocating more time for independent training of applicants and for the terms of pedagogical practice in GSEIs;
- transferfing partial responsibility for practice from HEIs to GSEIs;
- improving the coordination between institutions of higher and general secondary education;
- providing professional psychological and pedagogical assistance, as well as methodical one, and counseling to teachers responsible for practice, etc.;
- paying teachers for managing pedagogical practice, providing benefits during certification, giving financial incentives, etc.;
- taking into account the new demands of society regarding the training of highly qualified teachers.

Experience of Ukraine. In Ukraine, in particular at the Department of Education and Pedagogical Innovations of Hryhorii Skovoroda University in Pereiaslav, the following types of practices are provided: introductory, psychological and pedagogical, educational and extracurricular, pedagogical practice in out-of-school educational institutions, educational pedagogical, and pre-diploma. These are for quality practical training of future specialists in the specialty 011 Educational, pedagogical sciences of the first (Bachelor's) level of higher education, taking into account the experience of economically developed countries of the world and countries with transition economies, regarding practical training of future teachers for innovative activities through the educational and professional programs "Social and educational and leisure activities with children and youth in educational, extra-curricular institutions and communities", "Teacher's educational activity in conditions of inclusion". During the practical training of applicants of the second (Master's) level of higher education on the educational and professional program "Pedagogy of the Higher School" specialty 011 Educational, pedagogical sciences, the following pedagogical practices are carried out: management practice at HEIs, scientific research practice, pedagogical practice at HEIs. During the specified types of practice, the applicants consolidate theoretical knowledge, improve practical skills and abilities, use innovativelearningtechnologies,modernformsandmethods

of scientific information analysis and processing, study information resources of scientific libraries, learn to use tools of modern management in order to form general and professional competencies for future innovative professional activity.

Hryhorii Skovoroda University in Pereiaslav implements the idea of training teachers as competent and highly qualified professionals, capable of carrying out not only future innovative educational activities, but also extracurricular ones, using modern pedagogical technologies, methods and techniques. So, scientists N. Onyshchenko *et al.* (2021) characterized a favorable innovation environment (includes press conferences, extracurricular projects, trainings, game technologies (in particular, educational games, role-playing business games, etc.), quests (real, imaginary, virtual), street cinema, competitions, "night football", online meetings with popular people, the introduction of a foreign language into extracurricular activities, etc.), which, in their opinion, helps future teachers to try and test their own professional competences, in particular with regard to the implementation of extracurricular work, mastery of the basics of pedagogical innovations, the development of innovative resources and the implementation own innovative educational potential and the entire educational institution as a whole.

The result of the conducted research on the practical training of future teachers in the developed countries of the world and countries with a transition economy are *methodological recommendations for Ukrainian HEIs*, in particular: it is worth updating the programs of pedagogical practices taking into account global trends in the practical training of future specialists; it is necessary to improve the principles, forms and methods of interaction of institutions of higher and general secondary education; it is recommended that the curricula of HEIs increase the number of hours for studying the educational components of the pedagogical direction and extend the terms of pedagogical practice in GSEI; to ensure quality monitoring of pedagogical practice; to contribute to the improvement of the professional competence and professional skill of scientific and pedagogical workers-managers and methodologists of practice; to supplement curricula and educational programs of HEIs with educational components aimed at forming a culture of innovative activity. Attention should also be paid to updating the following links of practice: "intern – parents of students – directorate of the GSEI", "practice manager – subject teacher – class teacher", as well as an effective combination of innovative educational and extracurricular activities of the future teacher.

The comparative analysis of the results of works related to this article topic is presented below. Based on the study of the experience of Great Britain, Germany, Canada, the USA, Finland and Sweden on future teachers professional practice, scientists L. Lukianova *et al.* 2023) found that in most of them two models of practical teacher training are distinguished (concentrated, which is concentrated on all training courses with deepening of content and increasing responsibility every year, and sequential, which involves gradual complication and increasing involvement of the student in activities, i.e. from the role of trainee to mentor) and two strategies of pedagogical practice are implemented (practice is carried out throughout all years of study based on the principle of combining theory and practice; practice is carried out in the last year of study with the aim of strengthening theoretical knowledge, focusing on the development of practically oriented competences). As can be seen from the research results of the authors of this work, there was no study of the issue in terms of practical training of future teachers for innovative activities, and there is also a lack of a generalized definition of the specifics of pedagogical practice in these countries and methodical advice for educational institutions of Ukraine.

Scientists N. Nychkalo *et al.* (2021), investigating the experience of teacher training in Great Britain, Germany, Hungary, Finland, China and Australia, came to the conclusion that two main models of teacher training are implemented in these countries: "parallel" (simultaneous study of all components of the educational program throughout the entire period of training future teacher) and "sequential" (study of general and special subject disciplines at the bachelor's level, and the discipline of the psychological-pedagogical cycle and practice at the master's level). The scientists noted that both models are characteristic of Great Britain, Australia, Hungary, China; a parallel model has become widespread in Germany and Finland. They also determined that in these countries significant importance is attached to maintaining the teachers' social status, ensuring a high level of payment for their work, creation of the necessary conditions for continuous professional development, which is provided by a significant number of providers of pedagogical education (universities, institutes, colleges, higher pedagogical schools, school consortia), which constantly respond to new demands of society regarding the training of highly qualified teachers. From this it is clear that there is a close connection between the professional activity of teachers and their training in the GSEI with innovations in education, but the study did not identify the general common specifics of pedagogical practice in these countries regarding the training of future teachers specifically for innovative activities, although 15 proposals were proposed regarding the further improvement of professional training in Ukraine.

CONCLUSIONS

So, the article analyzes and summarizes the experience of economically developed countries of the world and countries with a transition economy regarding the practical training of future teachers for innovative activities. It has been determined that pedagogical practice in HEIs of Ukraine and foreign countries is not only an important means of training specialists, but also an effective factor in self-improvement and self-development, creative self-realization in pedagogical activities, increasing the levels of future teachers' professionalism and pedagogical skills. The

general specifics of pedagogical practice in the developed countries of the world and countries with transition economy have been clarified (active using of innovative information and communication technologies during pedagogical practice; allocating more time for independent training of applicants and for the terms of pedagogical practice in GSEIs; transferfing partial responsibility for practice from HEIs to GSEIs; improving the coordination between HEIs and GSEIs; providing professional psychological and pedagogical assistance, as well as methodical one, and counseling to teachers responsible for practice, etc.; paying teachers for managing pedagogical practice, providing benefits during certification, giving financial incentives, etc.; taking into account the new demands of society regarding the training of highly qualified teachers, etc.). The experience of Ukraine on the example of Hryhorii Skovoroda University in Pereiaslav regarding high-quality practical training of future teachers, taking into account innovative extracurricular activities, is highlighted.

As a result of the study of the future teachers practical training in the developed countries of the world and countries with a transition economy, methodological recommendations were proposed for Ukrainian HEIs, which take into account global trends and provide for the improvement of the principles, forms and methods of interaction of HEIs and GSEIs (including such links as "intern – parents of students – directorate of GSEI", "practice manager –subject teacher – class teacher"), ensuring quality monitoring of pedagogical practice, promoting the improvement of scientific and pedagogical staff professional competence and professional skills as practice methodologists and managers, updating pedagogical practice programs of HEI and extension of the terms of their conduct, improvement of educational programs of HEI by increasing credits for studying educational components of pedagogical direction and introducing educational components aimed at forming a culture of innovative activity, ensuring an effective combination of innovative curricular and extracurricular activities of future teachers. Taking into account the outlined methodological recommendations will primarily contribute to the improvement of the practical training of future teachers for innovative activities. The conducted research does not claim to solve all aspects of the specified problem. It may be promising to determine the ways of effective implementing the future teachers' practical training experience of leading countries into the higher education of Ukraine.

ACKNOWLEDGMENTS

We would like to express our gratitude to the library of Hryhorii Skovoroda University in Pereiaslav for providing technical assistance and ideas that made the research possible.

CONFLICT OF INTEREST

There is none.

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Практична підготовка майбутніх учителів до інноваційної діяльності: міжнародний досвід

Анотація. Одним із спільних завдань світового освітнього простору є якісна практична підготовка вчителя із сформованими сучасними фаховими компетентностями на базі теоретичних знань, здобутих під час навчання у закладах вищої освіти, вмінь творчо реалізувати їх та здійснювати інноваційну професійну діяльність, ефективно використовуючи новітні технології навчання, – це все підсилює роль педагогічної практики, як певного засобу досягнення ефективних результатів. Мета статті – проаналізувати, обґрунтувати та узагальнити міжнародний досвід практичної підготовки майбутніх учителів до інноваційної діяльності. Використано теоретичні методи: аналіз практичної підготовки іноземних майбутніх учителів, узагальнення отриманих даних з метою визначення стану їх практичної підготовки. У статті проаналізовано та узагальнено досвід економічно розвинених країн світу (Великої Британії, США, Німеччини, Японії, Франції, Данії, Австрії, Нідерландів) та країн із перехідною економікою (Греції, Ірландії, Португалії, Польщі, Угорщини), щодо практичної підготовки майбутніх учителів до інноваційної діяльності. Уточнено загальну специфіку педагогічної практики у цих країнах (активне застосування інноваційних інформаційно-комунікаційних технологій; великий обсяг самостійної підготовки здобувачів та термінів проведення практики у закладах загальної середньої освіти; перенесення часткової відповідальності за практику із закладу вищої освіти на заклад загальної середньої освіти; вдосконалення координації між закладом вищої освіти та закладом загальної середньої освіти; надання відповідальним за практику вчителям оплати та преміювання, переваг під час атестатації, фахової психолого-педагогічної допомоги та методичної підтримки; врахування нових запитів суспільства до педагогів). Висвітлено досвід України на прикладі Університету Григорія Сковороди в Переяславі. Зазначено, що у закладах вищої освіти України та закордону педагогічна практика є провідним чинником самовдосконалення і саморозвитку, творчої самореалізації у педагогічній діяльності, підвищення рівнів професійності та педагогічної майстерності майбутніх учителів. Запропоновано методичні рекомендації проведення педагогічної практики, які враховують світові тенденції та можуть бути реалізовані у педагогічних закладах вищої освіти України за підтримки закладів загальної середньої освіти, задля вдосконалення практичної підготовки майбутніх учителів до інноваційної діяльності

Ключові слова: економічно розвинені країни світу; країни із перехідною економікою; педагогічна практика; інновації; вища освіта; майбутні педагоги

Vol. 2. No. 2. 2023 Scientia et societus
Received: 25.07.2023.
Revised: 28.10.2023.
Accepted: 12.12.2023.
Journal homepage: https://ses.journal.in.ua/index.php/ses/issue/view/4

UDC 378.147:303.094.7 *DOI: 10.69587/ss/2.2023.84*

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The problem of application of simulation methods and teaching tools in the educational process of higher education institutions

Abstract. Modern professional training of teachers requires the introduction of innovative technologies, in particular simulation technologies, which emphasize interactivity, creativity and the use of information and communication methods. These technologies are aimed at preparing for practical activities, developing critical thinking and gaining experience through the simulation of pedagogical situations.The purpose of the study was to analyze the features of the application of simulation methods and tools in the educational process of a higher school. The methods of analysis included the analysis of literary sources, the study of the practice of using simulation methods and teaching aids in the educational process, and questionnaires and surveys among students and teachers. Simulation methods and learning tools contribute to the development of critical thinking, interpersonal skills and the ability to adapt to different professional situations.The results of the study indicate the importance and effectiveness of the use of simulation technologies in the educational process of higher education institutions, which makes it possible to make the learning process interesting, visual and practical and to build it on the basis of activity and competence approaches. However, technical limitations and lack of training of teachers to use simulation methods and tools in the educational process are the main factors that complicate the implementation of simulation technologies in the educational process. Taking into account the potential advantages of the studied methods, the effectiveness of the application of simulation methods and training tools as a tool for improving the quality of professional training of future specialists has been proven. The practical significance of the work is that the results of the study can be used during the organization of the educational process of students of pedagogical specialties of higher education institutions, updating the methodological and practical component in the teaching of educational components

Keywords: simulation technologies; high school; students; teachers; training of specialists; interactive learning methods; virtual laboratories and simulations

Suggested Citation:
Khmelnytska, O., & Tkachenko, L. (2023). The problem of application of simulation methods and teaching tools in the educational process of higher education institutions. *Scientia et societus*, 2(2), 84-95. doi: 10.69587/ss/2.2023.84.

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INTRODUCTION

The relevance of this study lies in the need to evaluate the effectiveness of simulation methods in the training of students, as well as in determining possible challenges and obstacles in their implementation. The modern world is marked by the rapid and constant development of technologies, which significantly affects various spheres of life, including education. Higher education institutions face various challenges related to the training of competent specialists in the modern world. In this context, the use of simulation methods and learning tools, which can provide a more effective and professional educational process, is of great importance.

In recent decades, simulation methods and learning tools have been widely used in the educational field. This is facilitated by the digitization and technologization of society, new methods and means of training organization appear, including virtual reality, simulations and interactions. They provide an opportunity for students of education not only to acquire theoretical knowledge, but also to gain real experience of critical and creative application of this knowledge when solving practical tasks, which contributes to increasing the level of their training and developing the necessary professional competencies (Basiuk *et al*., 2018). However, despite the potential advantages of simulation methods and teaching tools, there are numerous problems that prevent their effective implementation in the educational process of higher education institutions. These problems include technical and financial limitations, the lack of appropriate training of scientific and pedagogical workers, as well as the need for constant updating of the content and optimal selection of teaching methods. In particular, the focus is on the integration of digital technologies into the educational process, the adaptation of courses to the needs of the modern labor market, and the development of critical thinking skills and problem analysis among students (Plahotnik & Shubina, 2021).

An overview of scientific research is presented, which is focused on the analysis of various aspects of the use of simulation methods and teaching aids in higher education institutions. The works selected for review highlight a wide range of approaches and research in this area. The author M. Diachenko-Bohun (2014) focuses on the consideration of active learning methods. The author analyzes how these methods can enrich the traditional educational process, in particular through the involvement of students in active participation in learning. L.V. Ivanova (2022) examines the use of multimedia technologies in education and emphasizes computer games and multimedia as means of increasing the effectiveness of the educational process. I. Marchuk (2019) analyzes the use of simulation methods for the development of students' economic competence. The formation of teachers and the formation of relevant competencies in them by means of innovative teaching technologies are studied by Yu. Boichuk & A. Boiarska-Khomenko (2022). Kong *et al*. (2017) in their work consider the theoretical aspects of simulation modeling and its application in various fields of knowledge. Researcher N.P. Onyshchenko (2021) focuses on interactive learning methods, investigating their impact on improving the quality of education. It is also worth noting the work of Y. Pirozhenko & T. Burlaenko (2018), they investigated the use of multimedia tools in the educational process, including their impact on improving teaching methods. R. Pastuna-Doicela *et al*. (2023) consider virtual simulation as an innovative strategy in training students, which ensures the continuity of theoretical and practical training, promotes the development of cognitive, attitudinal and professional skills in students, and also ensures the integrity of the learning process. M.A. Stewart *et al*. (2023) in their publication explored the possibilities of using simulation tools, such as: Kahoot to encourage participation in interactive practical activities, Red Blood Cell Simulator to perform practical tasks independently at home, and Digital Differentials, which provided an opportunity to simulate a laboratory experiment. The use of these methods improves memorization of information, is an optimal and effective means of learning.

Together, these studies provide an in-depth analysis of the use of simulation and interactive methods in higher education, highlighting their potential to improve the quality and effectiveness of learning. The purpose of this article was to assess the current state of application of simulation teaching methods in higher education institutions, to determine their impact on the quality of education, and to identify opportunities for its further improvement. The scientific novelty of the work consists in a comprehensive approach to the assessment of the impact of the use of simulation methods and tools on the effectiveness of the organization of the educational process, as well as in the identification of trends and prospects for their further development in the context of the globalization of the educational space.

MATERIALS AND METHODS

The tasks of the research included the analysis of scientific publications, the evaluation of the effectiveness of the application of simulation methods during the teaching of various disciplines, as well as the study of the opinions of teachers and students regarding the effectiveness of using these methods. The research methodology involved the implementation of a number of components. The study focused on the use of simulation methods and learning tools in the educational process of the University of Grigory Skovoroda in Pereyaslav.

Among them: a review of the literature, which made it possible to conduct an analysis of scientific works on simulation teaching methods and to determine key parameters for research; the sample included the survey of 10 teachers and 50 students of Hryhorii Skovoroda University in Pereiaslav, and the selection criteria included

experience in using simulation methods and tools in education and a variety of educational specialties; data collection methods were selected (questionnaires, surveys, interviews and analysis of curricula for primary data collection); experimental research, which made it possible to conduct and analyze a series of educational activities (lectures, practical classes, practice), where simulation methods were used; statistical analysis of the collected data (the obtained data were analyzed to identify trends in the use of simulation methods and tools in the higher education process).

At the beginning of 2023, an in-person survey of groups of teachers and students was conducted, which made it possible to draw conclusions about the use of simulation learning technologies in practical classes, during the implementation of research projects and independent works. The questionnaire included a number of questions, in particular: Do the respondents understand the essence of the concept of "imitation technologies?"; Have they had the opportunity to use simulation technologies in their own practical activities? How often? Did the respondents feel the benefits of using simulation technologies in education? Were there any difficulties? Is it interesting to work with non-traditional means in classes? Were you able to increase the level of knowledge by using simulation technologies? The survey was conducted without violation of ethical norms, on a voluntary basis and anonymously. All participants were fully informed about whether anonymity was ensured, why the study was being conducted, how their data would be used, and whether there were any associated risks.

The conducted research included the description of a number of educational materials: questionnaires and surveys designed as specialized tools for collecting qualitative and quantitative data from teachers and students; technological tools: used specialized software (3D printer, audio concentrator and audio blocks, models of biological objects, interactive boards, computer simulation, etc.) to simulate the educational process; educational materials: an analysis of educational components, including the possibility of using simulation methods, was carried out. In particular, such educational practices as: Higher school pedagogy, Digital technologies in education, Modeling of educational and professional teacher training, Pedagogical skill, Foreign language for professional direction, Human anatomy, Biology teaching methodology, Biotechnology (Hryhorii Skovoroda..., n.d.).

RESULTS AND DISCUSSION

Simulation technologies in education include the use of various methods and tools that allow simulating real situations or processes for educational purposes. Simulation technologies in education consist in the creation of models, simulations that imitate real processes or situations of professional activity. This involves the use of virtual laboratories, simulation simulators, pedagogical modeling, etc. As rightly noted by O. Budnyk *et al*. (2022) simulation methods involve activity and quasi-professional orientation of vocational training. They combine separate forms and methods of learning (concrete situation, role playing, discussion, etc.), but have greater flexibility, arbitrariness of imitation objects, provide for the introduction of unpredictable situations (Marchuk, 2019). As noted by D. Ostapchuk & N.M. Mironchuk (2017), the positive effect of the introduction of active (imitation) learning methods indicates the need to use them with students of higher education institutions of a pedagogical profile, which guarantees effectiveness and efficiency during the professional training of students for professional activities. In general, simulation technologies play an important role in modern education, helping to ensure high-quality and relevant training of students. However, their effective implementation requires careful planning, investment and continuous support. As noted O.I. Shapran & B.O. Bandur (2022) andmimeticmethods in education can be very diverse and include a number of approaches and tools, among them: virtual laboratories and simulations, the case method, role-playing and scenario exercises, interactive learning platforms, the use of artificial intelligence and adaptive learning, modeling and gamification, video and audio materials, internship with the performance of a job role, simulation training.

Virtual laboratories and augmented reality in the educational process. Virtual laboratories and simulations are important tools in modern education, especially in the fields of natural sciences, social sciences and digital technologies. Virtual laboratories are software or platforms that simulate real laboratory conditions. Students can perform experiments, interact with virtual equipment, and analyze data as in a real laboratory. Simulations are the creation of computer models that simulate real processes or systems. Simulations can reproduce complex natural phenomena, digitization processes, or pedagogical scenarios. The advantages of using the above-mentioned simulation methods and tools include: safety (virtual laboratories allow students to experiment without risking health or safety); accessibility (students can conduct experiments at any time and from any place); saving resources (no real materials and equipment are needed, which reduces costs); repeatability (experiments can be repeated many times for a deeper understanding of the material); complexity (the ability to simulate complex or dangerous processes that are difficult or impossible to reproduce in real conditions). Virtual (VR) and augmented reality (AR) technologies offer unique opportunities to enhance learning and enable learners to explore different subjects and concepts in a more visual, interactive and motivating way. Among the advantages of using VR and AR in education, a number of components can be characterized. In particular, virtual reality (VR) is characterized by the following features (Table 1):

Table 1. Characteristic features of virtual reality VR and AR.

Characteristic	Virtual Reality (VR)	Augmented Reality (AR)
Immersiveness	Provides a sense of immersion in a virtual environment.	Creates a connection between virtual objects and real objects.
Practicality	It is used to create virtual laboratories, simulators and simulation of practical scenarios.	Allows you to supplement reality with information and create interactive scenarios.
Increasing motivation	Stimulates active learning through interactivity and enthusiasm.	Provides ease of access and can encourage learning through additional information.
Connection with the real world	-	Creates a connection between virtual and real objects, facilitating learning and research.
Additional Information	-	Supplements reality with additional information, expanding students' knowledge.
Ease of access	Requires special equipment for an immersive experience.	Can be used on modern smartphones and tablets, providing easy access (Virtual and augmented reality: how new technologies inspire learning..., 2019).

Source: developed by the author.

If these technologies are used effectively, they can significantly enrich the educational process and contribute to a better understanding of complex theoretical concepts.

Using the case method and role playing to develop critical thinking and professional skills. The case method, or case study method, is one of the key pedagogical approaches, especially popular in pedagogy and psychology, but it is also often used during training in other specialties (biology, digital technologies, etc.). This method includes the analysis of real or hypothetical scenarios (cases), which allows students to creatively and creatively apply theoretical knowledge in practice. Features of the case method in education are clearly reflected due to the presence of mandatory components. First, case studies are usually based on real situations, pedagogical cases, psychological issues, digitalization issues, etc., giving students the opportunity to immerse themselves in specific scenarios. Second, the case method involves in-depth analysis. Students are asked to study the case, analyze the problem and develop possible solutions. This requires a high level of analytical skills and the ability to uncover the essence of the problem. Thirdly, the case method facilitates the application of theory in practice. Students are given the opportunity to apply theoretical knowledge in real situations, which contributes to the development of critical and creative thinking skills.

Among the advantages of the case method:

- students learn to analyze complex situations, identify key problems and develop strategies to solve them;
- provide students with "real" experience in a safe academic environment;
- discussion of cases often takes place in groups, which contributes to the development of communication skills, the ability to interact and work in a team.

This method is often used as a basis for group discussions during classroom classes. Students can analyze the case in writing, developing their own solution strategies; can consider and play roles from different parties involved in the case, presenting their solutions. The effectiveness of the method strongly depends on realism and relevance. Educators must possess discussion management skills and the ability to guide learners through complex analytical processes. Therefore, the case method is a powerful tool for preparing for challenges that may arise in real professional activity. It not only develops analytical and critical thinking, but also helps students develop the ability to apply theories in practical situations, preparing them to build successful careers. Role playing and scenario exercises are important tools in the educational process that allow students to simulate and recreate real professional situations. These methods contribute to the development of decision-making skills, interpersonal skills and other important competencies. Considering the features of role-playing and scenario exercises, one can highlight their key characteristics: simulation of real situations, where students participate in role-plays imitating real professional or social situations. It is important to note the variety of scenarios in such exercises, they can cover a wide range of situations, starting from business discussions and ending with crisis management. In addition, role-playing and scenario exercises contribute to the development of interpersonal skills. These exercises help students improve their communication skills, teamwork skills, and emotional intelligence in interpersonal relationships.

Among the advantages of using such simulation methods: students learn to make decisions in the context of real situations; role-playing games allow them to understand the vision and feelings of other people; exercises contribute to the development of communication, negotiation and teamwork skills; students learn to adapt and respond to unpredictable situations. However, when using such simulation methods and tools, it is necessary to take into account that role-playing and scenario exercises require careful preparation of scenarios and effective management of the simulation process and the diversity of learners and their ability

to adapt to different roles. Thus, role plays and scenario exercises are effective tools for developing critical thinking, interpersonal skills and the ability to adapt to different professional situations. According to O. Tsiuniak (2020), these methods provide students with the opportunity to actively participate in the educational process and develop the professional competences necessary for future implementation.

Development of interactive platforms and application of artificial intelligence in education. Interactive learning platforms are becoming more common in the educational process, especially in the context of the growth of online education. They include a variety of online resources that use interactive modules, quizzes, games, and other tools to increase student engagement and improve their understanding of course material (Table 2).

Table 2: Features of interactive learning platforms.

Characteristic	Interactive platforms
Interactive modules	Includes multimedia lectures, interactive exercises, simulations, etc.
Quizzes and assessments	They are used for self-testing of students' knowledge through quizzes and tests.
Game elements	Gamification is used to increase students' motivation and interest in the educational process.
Personalization of learning	Allows to adapt training to individual needs and level of students (Volkova, 2017).
Advantages	➥ flexibility and accessibility: the ability to study the material at any time and from any place; ➥ student involvement: interactivity promotes active involvement of students in the educational process; ➥ individual approach: adaptation of training to the needs of each student; ➥ improving understanding: visualization and practical tasks help to learn the material better;
Problems	➥ technical limitations: not all students have access to the necessary technical means; ➥ lack of personal contact: direct communication may be limited, which affects interaction; ➥ self-discipline and motivation: requires a high level of discipline and motivation for effective study;

Source: developed by the author.

Interactive platforms are used as a supplement to classroom classes to expand and deepen knowledge. Often, students use platforms for independent study of the material. According to L.V. Ivanova (2022), they are especially relevant for online courses, non-formal and distance education courses. Therefore, interactive learning platforms open up new opportunities for improving the educational process. They help adapt training to the individual needs of each student. However, the effective use of these resources requires taking into account various challenges and providing the necessary support from higher education institutions. The use of artificial intelligence and adaptive learning is one of the most innovative approaches in modern education. These systems use data on student performance and behavior to adapt learning materials and apply methods, providing a more personalized and effective educational process (Gundel, 2019).

The main features of artificial intelligence and adaptive learning:

1) Personalization of the educational process. Adaptation of educational materials according to the level of knowledge, learning style and needs of each student.

2) Analysis of data on success. Using artificial intelligence algorithms to analyze student performance, identify weaknesses, and suggest targeted tasks for improvement.

3) Adaptive tests and assessments. Tests that automatically adjust to the student's level of knowledge, providing more accurate assessment.

The use of artificial intelligence and adaptive learning provides a number of advantages, namely:

Effectiveness of learning. This approach takes into account the individual characteristics of students, which contributes to more effective learning of the material.

Support for different learning styles. Adaptive learning takes into account personal learning preferences, such as visual or auditory perception.

Continuous update of content. Automatic updating and adaptation of educational materials based on feedback and student success, which allows you to maintain the relevance of information.

Forecasting and identification of problematic issues. The use of artificial intelligence can help detect learning problems at an early stage and predict potential difficulties before they become critical.

Author F. Ke *et al*. (2021) writes that artificial intelligence and adaptive learning are widely used in distance education and online courses. Personalized learning allows students to work on their weaknesses individually. Among the problems during the application of artificial intelligence, the following can be distinguished: the effective use of artificial intelligence requires access to modern technologies and powerful software; it is important to ensure the protection of students' personal data and the ethical use of artificial intelligence; teachers must learn to qualitatively integrate these technologies into the educational process. Thus, artificial intelligence and adaptive learning open new horizons for the educational process, giving learners the opportunity to receive more personalized and effective learning. The use of these technologies can significantly improve the quality of education and ensure deeper assimilation of knowledge.

Modeling and gamification using video and audio materials in the educational process, as a technology for using game elements to attract students and increase motivation to study. By modeling pedagogical situations, students "immerse" themselves in the environment of the future profession and can feel themselves in the role of a specialist in a certain professional field (Diachenko-Bohun, 2014). Simulation modeling can be distinguished as a type of mathematical modeling. Researcher N.Y. Oliynyk (2020) notes that in the event that analytical models are not available or calculation methods have not been developed, they turn to a simulation model or simulator. Gamification is a technology that has great potential to improve learning and engage learners. It is based on the idea that game elements can be used to create a stimulating and interesting educational environment (Sagan, 2022). The main principles of gamification, on which the educational process is built:

Tasks and challenges. Educational material is presented in the form of interesting tasks and challenges that inspire students to actively participate in the learning process. Analogies with video games create an interactive and engaging educational environment.

Points and awards. The system of points and awards helps stimulate students to achieve specific goals and increases their motivation for active learning. This may include virtual or real rewards for results achieved.

Competition and cooperation. Gamification creates elements of competition and cooperation, developing not only individual skills but also teamwork skills. This contributes to the formation of communication skills and promotes mutual assistance between students.

Availability of feedback. Fast and effective feedback is an important element of gamification. It allows you to assess student achievement, receive feedback from them, and provide quick feedback that helps improve their learning.

Plot and story elements. Adding story elements makes learning more exciting and attractive. The use of stories can deepen understanding of material and promote a more emotional involvement in learning.

Gamification can be used effectively for a variety of purposes in learning, from improving outcomes to developing creativity, creativity and critical thinking. It is important to carefully consider and plan gamified learning scenarios so that they meet the specific educational goal and needs of students. Inclusion of multimedia resources to demonstrate complex concepts and support visual and auditory perception of information. Video production and animation are two powerful multimedia technologies that are used in the educational process to create visually attractive and interactive educational materials. Video materials and interactive animations are very important tools for quality learning, especially in distance learning. These technologies allow you to convey the key content of the educational material in the form of bright video presentations that are interesting, visual, concise and informative at the same time. The use of video and audio materials in education is one of the key elements of modern education, which helps make the educational process interesting, meaningful and balanced. Multimedia resources are effectively used for demonstrations, facilitate the process of information perception and provide a deeper understanding of the theoretical material.

Features of the use of video and audio materials include:

1) Visualization of concepts. Videos allow you to visualize complex ideas and processes, which contributes to better assimilation of the material;

2) Auditory perception. Audio materials can be useful for those who perceive information better by ear;

3) Increase engagement. Multimedia resources add variety to the educational process and contribute to the engagement of learners (Pirozhenko & Burlaenko, 2018).

The advantages of using video and audio materials in the educational process are that they dhelp meet the needs of students with different learning styles (visual, auditory); use video and audio to review real cases, experiments, interviews with experts, etc. Table 3 shows examples of the use of video and audio materials in education.

Table 3. Types of video and audio materials used in education.

Types of video and audio materials in education	**Description**
Video lectures and presentations	To present new material and explain complex concepts.
Instructional videos and tutorials	Demonstration of practical exercises and demonstration of experiments.
Podcasts and audio lectures	For those who prefer to learn by ear or in combination with other activities.
Factors of the effectiveness of the use of video and audio materials	**Main aspects**
Quality assurance content	Creation of high-quality and relevant materials.
Technical requirements	Availability of access to the Internet and appropriate technical devices.
Balance between traditional and multimedia methods	Finding the optimal combination of traditional and multimedia methods.

Source: developed by the authors.

Therefore, video and audio materials are powerful tools in education that help improve learning, increase student engagement, and support a variety of learning styles. Their integration into the educational process opens up new opportunities for deeper understanding and more effective application.

Internship with performance of a position role. Internship with performance of a job role is one of the most effective ways of practical training of students and young professionals for the real working environment. This method assumes that trainees will take on roles that correspond to their future professional responsibilities and perform real work tasks in real conditions.

A role-based internship includes several key features that promote development and valuable experience.

Real work experience. Internship allows you to gain practical experience in a real working environment, which is an integral part of understanding the specifics of the chosen profession.

Responsibility and independence. Interns not only observe the work of professionals, but also take an active part in solving real tasks, which contributes to the development of the ability to work responsibly and independently.

Mentoring and training. Experienced professionals often act as mentors, helping interns adapt and learn important skills that help them grow professionally.

Characterizing the advantages of internship with the performance of a job role, it should be noted that: internship allows you to develop practical skills necessary for the future profession; trainees learn to work in a team, understand the internal order and culture of interaction; an internship provides an opportunity to build professional contacts and a network that can contribute to career development. Among the key issues to anticipate when applying for a role-based internship is adaptation to the work environment, as adapting to a new environment can be a challenge for some interns. A balance between study and work is also important – interns need to find a balance between their study commitments and the work responsibilities of the internship. Thus, internships with the performance of a job role are extremely important for preparing young professionals for real working life. This is not only a way to gain practical experience, but also an important step for establishing professional contacts and career development.

Simulation training. Simulation training is an important component of the modern educational process, especially in areas where a high level of practical skills and understanding of complex processes are required. This method involves the creation of simulated situations or conditions that mimic real-life circumstances in order to teach and develop certain skills.

Features of simulation training: *realistic scenarios.* Simulation training often uses detailed scenarios that mimic real-life situations that professionals may encounter in their work; *practical experience.* Participants have the opportunity to test their reactions and decisions in a safe, controlled environment; *application of theoretical knowledge.* Simulation training allows you to apply theoretical knowledge in practice, checking their effectiveness in real conditions.

Among the advantages of simulation training: participants can experiment and make mistakes without risking real projects or people's safety; simulation training encourages the analysis of situations, decision-making and critical thinking; preparation is carried out for real challenges and situations that may arise in professional life; active involvement of participants and a high level of motivation due to the practical nature of the training.

Among the key challenges that must be considered when using simulation trainings:

- development of realistic scenarios. Creating credible simulation scenarios can be complex and requires deep knowledge in a specific domain;
- technical support. High-tech simulations require significant investment in hardware and software.

Thus, simulation training is an important tool in the educational process, providing practical experience and preparation for real challenges in a safe environment. This method helps participants apply theoretical knowledge in practice, develop critical thinking and decision-making skills that are key to success in many professional fields. All these simulation methods and materials help students better understand and learn to apply theoretical knowledge, developing critical thinking, analytical abilities and professional skills. They also contribute to the flexibility and adaptability of the educational process, making it more relevant to the needs of the modern world. In order to investigate the problem of using simulation methods and teaching aids in the educational process of higher education institutions, the authors conducted a study. Based on the results of the research, university teachers actively use simulation technologies in practical activities. The conducted survey showed that 8 out of 10 teachers indicated that they regularly use simulation technologies in their pedagogical practice. This includes the use of virtual and interactive tools that facilitate more hands-on and engaging learning. The teachers of Grigory Skovoroda University in Pereyaslav use simulation methods with the aim of deeper understanding and assimilation of complex theoretical concepts by students, conducting virtual experiments and creating situational tasks, which allows students to better understand the theoretical material. the following means can be singled out for one's own professional activity (Table 4).

Table 4. Means of simulation technologies, which are used in professional activities by teachers of the Hryhorii Skovoroda University in Pereiaslav

Software simulators	Example 1. Simulators for teaching pedagogy. Teachers of pedagogical disciplines use simulators that allow students to virtually experience different approaches to teaching and classroom management. This can include scenarios, lesson segments where students interact with virtual students, resolve conflicts, plan lessons, and assess student performance. Example 2. Simulators for language learning. At the Faculty of Ukrainian and Foreign Philology, simulators can be used to create simulated language environments where students can practice speaking and listening in a context that simulates real life situations.

Table 4. Continued

Virtual laboratories	Example 1. Virtual laboratories during the teaching of natural sciences. Science majors can use virtual labs to demonstrate complex experiments that would be dangerous or expensive to perform in real-world settings. Educators can perform virtual experiments, measuring reactions or simulating physical phenomena.
Interactive tools	Example 1. Interactive boards and programs. Interactive whiteboards and curriculum allow teachers to create an educational environment that engages all learners to interact in class. For example, teachers can use these tools to create interactive presentations, quizzes, and games that help students learn better. These examples demonstrate how simulation technologies are integrated into various aspects of the pedagogical process at the university, increasing the quality of learning and student engagement. They allow learners to gain practical experience and better understand complex theoretical concepts, thereby preparing them for real professional challenges.
Demonstration of complex concepts	Example 1. Interactive models in biology. Biology teachers use simulation technologies to demonstrate complex biological processes, such as cellular metabolism or genetic mutations. Interactive 3D models allow students to visualize these processes and better understand their dynamics.
Conducting virtual experiments	Example 1. Simulation of chemical reactions. Teaching the disciplines of the natural cycle, teachers use simulators to conduct virtual chemical reactions. Students can experiment with different reagents and conditions, observing the results in a safe and controlled environment.
Creation of situational tasks	Example 1. Role-playing games in pedagogy. Role-playing games are organized for teacher students, where they virtually act as teachers in the classroom. This allows them to experience different approaches to teaching, classroom management and interaction with students.

Source: developed by the author

Such applications of simulation methods and technologies play an important role in training students, allowing them to more effectively apply theoretical material in practical situations. This approach not only increases the effectiveness of learning, but also makes it more interesting and motivating for students. Problems and challenges faced by teachers when using simulation learning technologies:

First: *technical difficulties*. This can include hardware malfunctions that prevent effective delivery of classes, as well as software issues. Such problems may arise due to software incompatibility with existing hardware, as well as complications with updating and maintaining programs.

Second: *lack of resources*. Limited access to specialized simulation tools can limit the ability to dive deep into the subject. For some specialties, the lack of necessary simulation tools may be found. Teachers may also feel the need for additional training courses and workshops to develop their own skills in using simulation technologies.

Third: *the need for educational resources*. Teachers feel the need to create and provide methodological materials that will promote better learning and use of simulation tools in higher education.

The obtained results indicate the importance and effectiveness of the use of simulation technologies in higher education, at the same time indicating the need to solve technical and resource problems for their optimization and more effective application. Taking into account the data collected through questionnaires and surveys, the obtained results provide an understanding of the importance of applying simulation technologies in higher education, as well as highlight key issues and challenges that need to be considered in order to improve their effectiveness. The results showed that learners are more interested and involved in the educational process when interactive and simulation methods and learning tools are used. Educators noted that simulation technologies help students learn complex concepts better because they can "see" and "try out" theoretical knowledge in practice. Many teachers noted that faulty or outdated equipment hindered the effective use of simulation-based learning methods. Also, the lack of access to modern simulation tools for certain specialties was indicated as a significant obstacle. Teachers expressed the need for advanced training and additional professional development in order to learn how to effectively use simulation technologies. The need to create and distribute detailed methodological guides and resources to support teachers in using these methods and tools was noted.

The results questionnaires and surveys of students of Hryhorii Skovoroda University in Pereiaslav regarding the use of simulation teaching methods reflect both positive feedback and a number of difficulties. Therefore, in order to achieve the maximum effectiveness of the application of simulation technologies in higher education, it is necessary to solve existing technical and resource problems, as well as to provide teachers with appropriate training and support. The majority of students (42 out of 50) responded positively to the use of simulation methods. They believe that this contributes to a better assimilation of the material and the development of practical skills. Psychology students indicated that virtual scenarios for counseling skills training helped them better understand real-life situations they may encounter in their professional activities. Students of science majors noted the benefits of virtual laboratories, which allow them to safely conduct complex experiments. One of the problems was that some students experienced stress and feeling overwhelmed by the need to adapt to new, more complex learning methods. Students experienced difficulties in mastering complex software tools for simulation, which required considerable effort and time, and noted problematic access to the necessary simulation tools. Some learners felt limited in their access to virtual language platforms that could improve their foreign language learning.

Prospects for the introduction of simulation methods in higher education. Based on the results of the survey of students of the Hryhorii Skovoroda University in Pereiaslav, the following conclusions can be drawn that the majority of students have a positive attitude to the use of simulation learning methods. They believe that these methods contribute to better assimilation of theoretical material and development of practical skills, making learning more motivating and action-oriented. Despite the overall positive attitude, students also faced some challenges. This includes the feeling of overload and stress from the need to adapt to new, more complex learning methods, unequal access to simulation resources, which limits their ability to fully use these methods in learning. The results prove that although simulation methods have significant potential for improving the quality of education and developing students' practical skills, there are certain challenges that need attention. In particular, it is important to focus on ensuring equal access to resources for all students, as well as supporting their adaptation to new technologies in order to maximize the benefits of these learning methods. Conclusions from the survey emphasize the need for further development and integration of simulation technologies in the educational process. This includes improving technical support, ensuring equal access to resources for all learners, and providing additional support and guidance for those who have difficulty adapting to the new environment. Overall, these results indicate the significant potential of simulation methods in improving the quality of higher education, but also highlight the importance of addressing and solving identified challenges to achieve maximum effectiveness and accessibility of these methods for all learners. An analysis of curricula and courses that include the use of simulation methods was also conducted. The analysis was carried out as part of a study at Hryhorii Skovoroda University. Consider the table showing the main results of the analysis of curricula and courses that include simulationmethods (Table 5).

Table 5. General results of the analysis of curricula and courses at Hryhorii Skovoroda University in Pereiaslav

Positive and negative aspects of integration of simulation methods	Details
Integration of simulation methods	A large part of the courses combined various simulation methods, especially in pedagogical faculties.
Variety of applications	The humanities used simulation methods to display social simulations.
Impact on engagement and success	Courses involving the use of simulation methods increased the level of motivation and success of students.
Challenges and limitations	Lack of technical equipment and resources at some faculties.
	The need to improve the qualifications of teachers for the use of simulation methods and teaching aids.

Source: developed by the author.

Table 5 summarizes the key aspects of the study and reflects both positive and negative aspects of the integration of simulation methods and means of initiation into the educational process of higher education. It was found that a significant number of courses integrated simulation methods into their curricula. This included a wide range of disciplines, from the natural sciences to the humanities. For example, some teaching courses included virtual labs to simulate teaching situations, and digital learning technology courses used software simulators to teach coding and software development. In the humanities, such as psychology and pedagogy, simulation methods were used to develop scenarios, fragments of lessons that simulated social and pedagogical situations. The analysis showed that courses that used simulation methods had higher levels of student engagement and better performance scores compared to traditional teaching methods. Students noted that simulation methods help them better understand complex theoretical concepts and learn to apply theoretical knowledge in practice.

However, after analyzing the results of the study, a number of problems were identified, in particular, the lack of technical equipment and resources at some faculties, which limited the opportunities for the full implementation of simulation methods. In addition, the need to improve the qualifications of teachers for the effective use of these methods in education was noted. These results indicate the significant potential of simulation methods in improving the quality of higher education, but also emphasize the need for further investments in technical infrastructure and the development of scientific and pedagogical workers. To overcome the problems associated with the use of simulation methods and teaching aids in the educational process of higher education institutions, including the Hryhorii Skovoroda University in Pereiaslav, the following recommendations can be developed. Among the proposed steps to improve the educational process in a higher education institution, the following can be highlighted: improving the technical infrastructure (assessing the current state of technical equipment and software; ensuring regular updating and modernization of equipment; installing high-quality interactive whiteboards, computers and software in classrooms); training programs for teachers (organization of seminars and trainings for teachers on the use of simulation methods; development of methodical manuals and online resources for self-study; engagement of external experts to conduct master classes and workshops); student support (organization of orientation

sessions for students on the use of simulation methods; provision of psychological support for students who experience stress or difficulties in adapting to new methods; creation of student support groups and forums for sharing experiences and solving problems); ensuring equal access (implementation of a program to ensure equal access to simulation resources for all specialties; development of mobile laboratories and virtual platforms available to students regardless of their physical location); evaluation and tracking of effectiveness (regular evaluation of the effectiveness of simulation methods through the collection of feedback from students and teachers; use of analytics to track student success and improve educational methods); cooperation with the industry (establishing partnership relations, concluding agreements with companies and organizations to find new bases with available resources for the application of simulation technologies; involving industry representatives to conduct guest lectures and practical classes). It is also possible to propose an oriented program plan for Hryhorii Skovoroda University in Pereiaslav aimed at improving the use of simulation methods and teaching aids (Table 6). It can look like this:

Table 6. Integration of Simulation Methods into the Educational Process.

Phase	Duration	Basic actions
1. Assessment and planning phase	1-3 months	➥ audit of technical resources; ➥ collecting feedback from students and teachers; ➥ development of an implementation plan, determination of priorities and goals;
2. Learning and development phase	4-6 months	➥ conducting trainings for teachers; ➥ development of online resources and methodical materials; ➥ providing support to students: orientation programs; ➥ psychological support;
3. Implementation and monitoring phase	7-12 months	➥ updating equipment and resources; ➥ implementation of pilot projects; ➥ purchase and installation of new equipment and software; ➥ updating the infrastructure to support new methods;
4. The phase of evaluating the results and predicting further steps	After 1 year	➥ analysis of the effectiveness of implemented methods based on academic results and feedback ➥ identification of areas for further improvement ➥ development of strategies for the development and improvement of the system ➥ planning updates of technical infrastructure and materials

Source: developed by the author.

This plan envisages a comprehensive and prognostic approach to improving the system of using simulation methods and tools in the educational process of Hryhorii Skovoroda University in Pereiaslav, focusing on technical modernization, development of scientific and pedagogical workers, support of students and continuous improvement of the educational process. These recommendations and programs will contribute to the more effective implementation and use of simulation methods and tools in the educational process, increasing the quality of education and the development of future professional skills of students.

Carrying out a comparative analysis of this research results and the research results of a number of foreign scientists who studied the peculiarities of the use of simulation technologies in the educational process, it should be noted that the research results A. Holoborodko *et al*. (2020) agree with the current results and prove that the methods of using media education are quite appropriate and effective tools for increasing learning motivation, the quality of the educational process, and the formation of analytical and critical thinking among students. In turn, A. Heiman *et al*. (2022) emphasize the importance of applying innovative approaches during the organization of various types of activities and reveal the main features of imitation and threshold models, as such, which are modern trends in creating a high-quality competitive environment in an educational institution.

CONCLUSIONS

Based on the analysis of the results of the student survey of Hryhorii Skovoroda University in Pereiaslav, the following general conclusion can be drawn: simulation teaching methods occupy an important place in the educational process and are positively perceived by the majority of students. These methods contribute to better assimilation of theoretical material, increase student engagement and help in the development of practical skills. Software simulators, virtual labs and interactive tools allow students to more effectively learn complex concepts and prepare for real professional challenges. At the same time, there are certain challenges and difficulties that need attention. Students faced stress and overload due to the need to adapt to more complex learning methods, and felt inadequate access to the necessary simulation resources, especially in less technologically oriented faculties. This highlights the need to ensure equal access to simulation resources for all students and support in adapting to new technologies. In order to achieve the maximum efficiency and availability of simulated training methods, it is necessary to solve the existing technical, resource and psychological problems, as well as to ensure a constant improvement in the quality of technical support and methodical support.

The effective implementation of simulation technologies in the educational process is a key factor in

improving the quality of education and ensuring practical training of students. Implementation of a comprehensive program that includes improvement of technical infrastructure, development of teaching staff, support of students and provision of equal access to educational resources will allow to maximize the benefits of simulation methods. It also includes regular evaluation and adaptation of methods to continuously improve them according to the changing needs of students and teachers. A key aspect is cooperation with industry and the use of advanced technologies, which will ensure the relevance of the educational process and prepare students for real professional challenges. The use of simulation technology has the potential to develop key skills students will need in the future. Thus, a systematic and multifaceted approach to the integration of simulation methods and tools into the educational process will be an important step in training qualified specialists and increasing the university's competitiveness. The prospect of further investigations is the study of the effectiveness of the application of simulation technologies in the process of professional training of future teachers, the development of programs based on simulation modeling.

ACKNOWLEDGMENTS

We express our sincere gratitude to the heads of departments, scientific and pedagogical workers and students of the Hryhorii Skovoroda University in Pereiaslav, who took an active part and contributed to the conduct of this study.

CONFLICT OF INTEREST

There is none.

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Проблема застосування імітаційних методів та засобів навчання в освітньому процесі закладів вищої освіти

Анотація. Сучасна професійна підготовка викладачів вимагає впровадження інноваційних технологій, зокрема імітаційних, які надають акцент на інтерактивність, творчість та використання інформаційно-комунікаційних методів. Ці технології спрямовані на підготовку до практичної діяльності, розвиток критичного мислення та набуття досвіду через імітацію педагогічних ситуацій. Метою дослідження був аналіз особливостей застосування імітаційних методів та засобів у освітньому процесі вищої школи. Методи аналізу включали аналіз літературних джерел, вивчення практики використання імітаційних методів і засобів навчання в освітньому процесі та анкетування і опитування серед здобувачів освіти і викладачів. Імітаційні методи та засоби навчання сприяють розвитку критичного мислення, навичок міжособистісної взаємодії та здатності адаптуватися до різних професійних ситуацій. Результати дослідження вказують на важливість та ефективність застосування імітаційних технологій у освітньому процесі закладів вищої освіти, що дозволяє зробити процес навчання цікавим, наочним та практичним і побудувати його на основі діяльнісного та компетентнісного підходів. Проте, технічні обмеження та відсутність підготовки викладачів до застосування імітаційних методів та засобів у освітньому процесі є основними чинниками, що ускладнюють впровадження імітаційних технологій в освітній процес. Враховуючи потенційні переваги досліджуваних методів, доведено ефективність застосування імітаційних методів та засобів навчання як інструменту підвищення якості професійної підготовки майбутніх фахівців. Практичне значення роботи полягає у тому, що результати дослідження можуть бути використані під час організації освітнього процесу здобувачів освіти педагогічних спеціальностей закладів вищої освіти, оновлення методологічної та практичної складової у викладанні освітніх компонентів

Ключові слова: імітаційні технології; вища школа; здобувачі освіти; викладачі; підготовка фахівців; інтерактивні методи навчання; віртуальні лабораторії та симуляції

Vol. 2. No. 2. 2023 Scientia et societus
Received: 20.08.2023.
Revised: 19.11.2023.
Accepted: 12.12.2023.
Journal homepage: https://ses.journal.in.ua/index.php/ses/issue/view/4

UDC 37.01/.09 DOI: 10.69587/ss/2.2023.96

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Mind maps as an effective tool in "Practical English language course"

Abstract. The article considers the issue of using mind maps in the Practical English course. It is emphasised that they help to structure, analyse, understand and memorise the necessary material. With their help, teachers can explain a new topic, systematise information, exercise control, summarise what they have learned, encourage communication, and create supports. This study aimed to consider the concept of "mind maps" and to highlight the possibility of their application in the study of the educational component "Practical English Language Course". Research methods includes analysis, systematization, and generalization of scientific research, as well as abstraction, idealization, and logical-structural analysis of the use of mind maps in the educational process. It is noted that this tool is also effective for a student, in particular, for systematizing knowledge, for preparing for classes, for test control, etc. The student can actively participate in the educational process, participating together with the teacher in the development of mind maps. The article states that one of the main uses of mind maps is to create visual schemes or diagrams to represent and organize ideas, vocabulary, grammatical structures, or thematic concepts. In the "Practical English Language" classes, students of higher education can use mind maps to create a schematic representation of the studied material, to activate speaking skills, to work with lexical material, with grammatical material, with text material, to present the results of project activities, to conduct brainstorming storming, discussion, debate, etc. Teachers adapt the use of mind maps according to the specific needs and preferences of their students, which promotes active learning, development of critical thinking and effective communication in the classes. The article emphasizes that in classes you can use ready-made mind maps presented in textbooks or on posters, prepare your own samples for class in the form of presentations or reference notes, in the process of presenting the material, build them in class, organize various types of individual and group activities of students with using ready-made mind maps. Their advantages in use by both teachers and students of higher education are indicated. The practical significance of the research is that its results can be used in the process of professional training of future philologists and English language teachers in higher education institutions, as well as for the preparation of scientific and methodological support using mind maps and in the self-educational activities of students

Keywords: mapping; teaching English; effective means; visualization; critical thinking

INTRODUCTION

The integration of Ukraine into the European and world community actualized the problem of the active use of foreign languages in all spheres of social life, which requires an increase in the level of communicative competence. In this regard, the need to increase the role of all subjects of the educational process was realized, taking into account the undeniable importance of traditional and new forms and methods of education in higher education, which directly affects the quality of professional training of specialists, in particular, regarding the formation of practical communication skills and abilities. This requires, in turn, the development and implementation of appropriate

Suggested Citation:
Borysova, N. (2023). Mind maps as an effective tool in "Practical English language course". *Scientia et societus*, 2(2), 96-109. doi: 10.69587/ss/2.2023.96.

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pedagogical technologies, the creation of a communicative educational space of higher education institution, the formation of students' communicative competence, the complex nature of which requires appropriate methodological support. The introduction of information and didactic technologies ensures effective foreign language teaching, as it allows students to access a wide range of educational information and improve foreign language communication, actualize the critical and creative thinking of higher education students, ensure the development of the ability to solve communicative foreign language tasks in the context of the transition from the subject-object to the subject-subject educational paradigm, and choose an effective learning strategy. Mind maps are a useful technic for use in the Practical English course classes. They can help higher education students organize and structure their thoughts, develop creative thinking, and facilitate better learning of language material. The use of mind maps in Practical English classes will help students organize their thoughts, develop creative thinking, and activate their speaking skills and increase their vocabulary. They can become an interesting and effective technic for improving the quality of learning and teaching English.

A significant number of scientists dealt with a problem of using mind maps in the educational process. In 2019-2023, the most scientific researches have been done on the use of mind maps in learning vocabulary. M. Alba (2021) evaluated the effectiveness of a mind-mapping strategy, applied through mapping software, in developing learners' vocabulary skills in English as a foreign language. It also considered how this strategy could help to overcome learning disabilities and develop learners' cognitive abilities. The study highlighted that the use of mind mapping software could be an effective tool for vocabulary learning, especially in virtual or hybrid settings that had arisen due to the COVID-19 pandemic. M. Lavrenova (2019) mentioned about the innovations in the educational process, teachers were able to use the created mind maps as a lecture outline, where each mind map block could contain comments, images, video files and hyperlinks to other online resources. This allowed you to cover a topic step by step, while providing visual aids to help students understand the material. W. Zhang *et al.* (2023) devoted their works to the study of vocabulary. It was noted that mind maps contribute to the development of short-term and long-term memory, in particular, they had a greater impact on long-term memory. The study also confirmed that mind maps were more effective in influencing the meaning of words than their forms, and that mind maps had a positive impact on independent learning of English vocabulary and improve teaching effectiveness. The introduction of mind maps into English vocabulary learning promoted logical memorization of words, improved understanding and retention of vocabulary, developed creativity and promoted self-learning.

Regarding language learning in general with the use of mind maps, some scientists should be mentioned: Y. Hrytsenko (2023) studied mind maps as a means of visualization in language and literature classes. The article also discussed the importance of innovations in education, which built a new education system and introduced new methods and principles of education. It was noted that for the successful implementation of innovations, it was important that they would not interfere with the educational process and not become an object of competition between teachers. The author pointed out that the teacher should encourage the use of mind maps, as they had significant advantages over other graphic aids. H. Hudyma (2022) focused on the use of the authentic materials in English language classes, in particular in the institutions of higher education. This paper highlights the importance of using words and expressions typical of informal oral communication and recommends introducing them alongside their literary equivalents. The author provided specific advice on planning and conducting lessons using authentic video material and noted that the active use of authentic materials helped to increase students' activity, develop various competences and develop their speaking skills. M.S. Luangkrajang (2022) showed in his research that the use of mind maps in English classes enabled students to be active learners by acquiring data, processing information, organizing details and constructing knowledge independently. In addition, mind maps also improved students' skills such as creative and critical thinking, collaboration and organisational skills, as well as their English language skills. Students also had a positive attitude towards mind mapping techniques that they were able to apply in other subjects. Mind maps appeared to be an effective cognitive learning tool in English classrooms as they helped students focus on key words and concepts in a lesson by requiring them to organise, plan, brainstorm and communicate with friends.

In their work, N. Nasr-Esfahani *et al.* (2021) analyzed the use of mind maps to stimulate teachers' creativity. The results also showed that teachers who used electronic mind maps outperformed those who used the traditional teaching method, especially in English language teaching assessments. R. Al-Jarf (2021) in his article described teaching spelling skills with a mind-mapping software. The mind maps created with this software could be used to introduce, categorise, visualise and reiterate phonics rules, as well as mnemonic tools for learning spelling. The graphical representation of words in mind maps helped students to see the relationships with the newly introduced phonics categories and developed skills in distinguishing phoneme-grammar associations in spoken and written words. Mind mapping strategies have been shown to be effective in improving vocabulary, conceptual understanding and text comprehension at different grade levels, across subject areas and with different types of learners, including English as a second language learners and learners with learning disabilities. The use of mind mapping helped to better organize, prioritise and integrate the materials presented in the course. His views were also echoed by D. Bhattacharya & R Mohalik (2020), who described digital mind mapping software and noted in their study that

digital mind mapping software was useful for brainstorming, building schedules, conceptual diagrams, construction plans, organisational charts and other technical diagrams. It is also used in software development and web design to create website diagrams and layouts. In the field of business intelligence, it allows you to import and display interactive information in the form of tables, graphs, etc. The strategy of digital mind mapping is a modern and powerful approach to memorising information that differs from the usual reading of texts.

However, after analyzing the scientific researches, authors came to a conclusion that there were almost no studies on the use of mind maps in classes on the "Practical English Language Course" in higher educational institutions, so a research of this area was urgent. The study aimed to find out the peculiarities of the use of mind maps technology, to develop recommendations for their use in the teaching of verbal and written communication in the "Practical English Language Course" classes. To achieve the goal, the following tasks were defined: investigate the concept of "mind map", to identify the advantages of their use in learning English, to highlight recommendations for their use in the "Practical English Language Course" to achieve various results.

MATERIALS AND METHODS

In the process of research, a complex of scientific and research methods was used, such as: theoretical – analysis of sociological, psychological, pedagogical, methodical literature in order to substantiate the theoretical and methodological foundations of the problem, with the help of which it was possible to find out the researchers' mind maps and to find out the principles proposed by them work with this tool. The next method that came in handy when dealing with this problem was a system-structural analysis, which helped clarify the problem of using mind maps, in particular for students studying the "Practical English Language Course". The method of argumentation of principles and goals was used to form professional foreign language communicative competence in future philologists or teachers. The analysis and synthesis helped to highlight the advantages of using mind maps and the selection of a list of approaches, criteria for the professional training of students studying at the faculties of foreign philology for the formation of professional communicative competence. Systematization and generalization were used for the purpose of forming conclusions. The next group of methods were empirical methods used in the study and generalization of pedagogical experience, in particular, through the processing of articles by researchers of mind maps, mentioned in this study. The method of comparison was no less important for highlighting the mentioned advantages in the use of mind maps in the "Practical Course of English" classes at philological faculties in higher educational institutions. The reliability of the obtained results and conclusions was ensured by the theoretical and methodological soundness of the provisions of the work based on the analysis of scientific and pedagogical achievements, the logic of the research and its relevance to its purpose, reliance on modern research on pedagogy, methods of teaching foreign languages. The Table 1 below shows examples of the analyzed works.

Table 1. Examples of analyzed works

Author and year	Research description
H.M. Davydiuk (2019)	This study examined the methodology of disseminating and transferring experience in the use of knowledge maps among students of a pedagogical college. The main focus of the work was that information and knowledge were key components of the information society, and teachers, as active participants in this society, had a special responsibility in working with information resources.
I. Kozhemiakina (2020)	The author defined mind mapping as an interactive technique useful for creating intellectual knowledge maps. It was noted that this method helped to memorize information and develop creative thinking. The possibility of combining mind mapping with other innovative technologies in education and in various fields of activity was highlighted. The importance of using association maps for understanding new terms and concepts in professional foreign languages was generalized. The possibility of combining mind mapping with traditional methods to create interesting and effective classes was emphasized.
N. Nasr-Esfahani *et al.* (2021)	The study investigated the impact of using electronic mind maps on the creativity of foreign teachers of English in Iran. The study also identified the attitudes and beliefs of these teachers towards such maps. The study involved 44 Iranian teachers who were divided into experimental and control groups. The experimental group used electronic flashcards to present learning material, while the control group used the traditional method.
I. Volotivska (2019)	The article provided a theoretical analysis of the concepts related to the professional training of foreign language teachers and identified the components of professional competence. Different interpretations of the terms were studied and their connection with the formation of teacher competencies was established. The initial understanding of the term «professional training of a foreign language teacher» as a process of forming special theoretical and practical professional scientific, subject and methodological competence was formulated.
Z. Zhang, *et al.* (2023)	This study examined the differences in adult learning through instructional videos with different L2 teaching methods, as well as analyzing cognitive load, motivation, and learning satisfaction during the learning process.

Table 1. Continued

Author and year	Research description
Y.P. Pashchenko (2020)	The paper noted that the study of group methods of teaching foreign languages, in particular English, had been a well-developed area of research and was proven in practice. The business game as an effective form of group interaction of students was studied, the methodological potential of group work was determined, and the role and place of group methods in the educational process was considered. Methodological recommendations for organizing group educational activities were proposed.

Source: developed by the authors

RESULTS AND DISCUSSION

Concept mapping is a technology for visualizing the relationships between different concepts, notions, ideas, and representations. Concept maps allow us to trace ideas, identify the development of concepts generated by scientists belonging to different scientific schools and associations. A term close to concept mapping is mind-mapping. Sometimes these terms are used interchangeably. However, G. Fauconnier (n.d.) emphasized that usually the latter were understood as hierarchical structures, and concept maps as arbitrary ones, but this division was conditional, especially since the technics that belonged to the class of concept mapping or mind mapping, as a rule, allowed solving both tasks.

While in English two terms are used – concept mapping and mind mapping, in Ukrainian one can find several translation options: "memory maps", "concept maps", "maps of thoughts", "intelligence maps", "mind maps". The most appropriate option in the context of the information and didactic environment is to use the term "mind maps". According to G. Fauconnier (n.d.) concept maps are graphical technics for organizing and representing knowledge, that includes concepts (notions), usually depicted in figures of a certain type (circles, rectangles), and the relationship between them (in the form of lines connecting two concepts). These notions have short formulations (often in one word) related to the concepts of the subject area that describe the situation under study or patterns in events, objects, and situations. By the way, connecting words or phrases are indicated on the lines to explain the type of relationship between concepts.

Mind maps originated as a means of visualizing children's representation of knowledge, and then began to be used as a technic for scientific research and solving practical problems (How to use a Concept Map to organize and comprehend information (n.d.). Despite the similarities between mind maps and concept maps, these two methods differ in many aspects, but computer programs, in particular programs that create mind maps, allow you to build mind maps. In concept maps, graphic techniques are used to represent knowledge by structuring a network of related concepts. The idea of using diagrams and drawings to improve knowledge assimilation is not new – it has been used in education for a long time. But only relatively recently has this idea been studied and developed as a special way of thinking. It is believed that this method of information visualization was first used by the philosopher Porfirije of Tyre in the third century AD, trying to understand Aristotle's concepts (Vlasiuk, 2020). Serious modern developments in this area date back to the 1960s and were associated with the development of the theory of semantic networks in relation to the study of human thinking in the learning process. At the same time, rather complex diagrams were used to visualize the relevant structures. The usual form of the "mind map" was developed a little later. The basic rules for "Concept mapping" (a way of representing and linking thoughts) were developed in the 60s by Professor J.D. Novak of Cornell University as a means of intensifying the learning process in teaching scientific disciplines. The term appeared in the process of developing the "constructivism" trend, according to which learning should be implemented as an active process that involves the active construction of knowledge by students based on their own experience – not by receiving ideas, but by creating them. This approach is based on the constructivist theories of Jean Piaget, who, in particular, is credited with the statement: "The child is the architect of his own intellect" (Novak, n.d.).

J.D. Novak (n.d.) borrowed the idea of Concept mapping from the theory of David Ausubel, who showed the importance of previous experience for the formation of new concepts. The copyright for "Concept mapping" as a method of creating and structuring new ideas was taken by the English psychologist Tony Buzan, who called his method "Mind Maps" and used it to create a number of computer programs. For the first time, the theory of mind maps was introduced to the world in the spring of 1974 after the publication of Tony Buzan's book "Use Your Head". Tony Buzan greatly simplified the technique of their construction and made them radial, i.e., built around a central thought or problem. This technology was called Mind Mapping. O. Orda & D. Novitska (2020) in their research noted that mind maps were a tool that allows you to think using all your creative and intellectual potential. This was the development of Tony Buzan – a well-known writer, lecturer and consultant on intelligence, learning psychology and thinking problems. In the process of processing incoming information, the human brain performs five main functions: perception, retention, analysis, conclusion, and control. Without delving into details, it can be stated that the process is highly non-linear, emphasizing not the flow of information itself, but solely the key points, omitting superfluous facts. T. Buzan (2021) gave this process a rather convenient name – Mind Map, defining it as a form of graphical expression of radical thinking. In turn, radiant thinking (from "radiant" – "a point in the celestial sphere from which the visible paths of bodies with the same directional speeds seem to emanate" – an analogue of associative thinking) is defined as the basic principle of human brain functioning. The pragmatic aspect of radical

thinking is the creation of an alternative way of presenting the learned materials, that is, with the use of mind maps. S. Abuvatfa *et al.* (2019) noted in his research that the mind map, based on the radiant thinking pattern of our brains, was a tree-like structure diagrammed with colorful and highly organized key words.

The mapping can be used for several purposes (Fig. 1). In his work T. Buzan (2021) noted that the main advantage (Table 2) of this method was to provide a powerful representation technic that showed complex relationships, thus establishing a transparent connection, between different concepts.

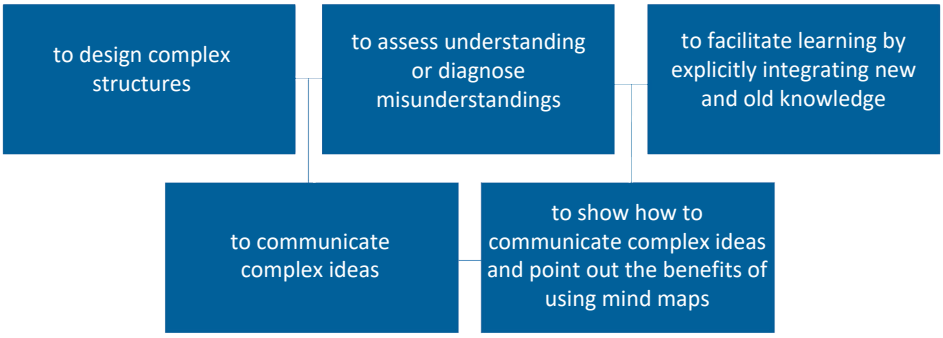

Figure 1. Purposes for using the mapping

Source: developed by the authors

Table 2. Advantages of using mind maps

1. Teaching and reviewing the topic.	Complex concepts can be explained and organized in a systematic way. This helps teachers convey to students a clear overall picture of the topics and their relationships. This way, there is less chance of missing or misinterpreting any important concepts.
2. Reinforce understanding.	The use of mind maps can strengthen understanding and therefore make learning easier for students. It allows you to visualize key concepts and summarize their relationship.
3. Check learning and identify misconceptions.	Evaluate the learning process. Teachers can assess students' achievement by identifying misconceptions and missing concepts

Source: developed by the authors

M. Alba (2022) emphasized that mind mapping strategies provided learners teachers with tools to achieve the meaning relations of the words in the passages. They also analyzed the key words in the texts and helped the learners focus on the target critical and creative thinking elements. That's why, the use of concept maps can also help teachers evaluate the learning process. They can assess student achievement by identifying misconceptions and missing concepts. Mind maps are gaining popularity as a problem-solving technic in education. Concept mapping can be used to enhance the problem-solving phases that generate alternative solutions and options. Since problem solving in education is typically done in small groups, learning should also benefit from the communication-enhancing properties of concept mapping (Novak, n.d.). O. Romanovska (2019) claimed that the use of these methods of learning activates the thinking of the participants of the pedagogical process, developed partnerships, increased the effectiveness of training, promoted self-improvement of the educational recipients. Creating mind maps can be compared to participating in a brainstorming session. When people put ideas down on paper without criticism, the ideas become clearer and the mind is free to receive new ideas. These new ideas can be related to ideas already in the works, and can also trigger new associations that lead to new ideas. Thus, the use of mind maps is an effective technic in the educational process and is a complement to classical methods, appealing to the individual character of each student. The urgent task of a modern teacher is to teach all students to learn. The basis of personality development is the system-activity approach. This approach to learning is aimed at developing each student, at forming their individual abilities. Any knowledge acquisition is based on the student's mastery of learning actions, mastering which, the student would be able to acquire knowledge independently, using various sources of information (Trofimchuk & Khlupianets, 2020).

The main goal of the system-activity approach is to teach students how to learn, i.e. to assimilate and process information. At the current stage of society's development, the amount of information is so large that people inevitably have to face certain requirements for memory, the ability to solve problems and analyze complex data. If you put in less effort, most of the information will remain unassimilated. Perseverance leads to a decrease in performance, and learning, as a result, is associated with boredom and constant fatigue. In their works, I. Kozhemiakina (2020) noted that teachers employed a variety of approaches and techniques to help students learn new words. One of these teaching techniques was mind-mapping. This is a technique or concept that demonstrates how the brain can process different concepts and data that are related to each other. In other hand, N. Borysova (2020) mentioned that

the goal of every teacher was to make students interested in their subject, to make them want to learn it. A student's need to learn a discipline also depends on the teaching methods used by the teacher. So, let's consider in Table 3 the conceptual apparatus of the effectiveness of using mind maps in teaching language.

Table 3. Effectiveness of using mind maps in teaching language

Purpose	to develop skills in creating mind maps in order to improve the quality of education, motivate learning activities, develop students' intellectual and creative abilities
Tasks	to describe the method of creating mind maps and the possibilities of its use for organizing students' activities in English classes
	to reveal the goals and principles of creating mind maps
	to develop skills of practical use of conceptual schemes based on a new style of thinking
	to develop key competencies (communicative, cognitive, regulatory) through working with mind maps
	describe their personal experience of creating mind maps
Results	intensification of cognitive activity, improvement of students' academic performance
	development of students' self-education and self-control skills
	increasing the comfort level of learning
	increasing the activity and initiative of students in the classroom
	development of information thinking of students, formation of information and communication competence
	establishing new relationships between teachers and students

Source: developed by the authors

In H. Davydiuk's work (2019) noted that at the beginning of the process of creating such maps, students should understand their functions, the possibilities of such knowledge maps allowed to: improve memory, actualize facts and images; analyze the results; analyze, structure and process data; make it possible to deeply and firmly learn the educational material in a concise verbal and figurative form. Mind maps are one of the techniques of critical thinking technology. It is a technic that helps to structure information, analyze, understand, find new ideas and ways to solve problems. It is a visual way of presenting information that reflects the relationships between concepts. In simple terms, it is a diagram with a keyword/picture in the center and branches (categories, basic concepts) extending from it in different directions, branching into branches (paragraphs, subparagraphs). The result is something like a spider web or root system (Sun & Wang, 2022). You can draw a map on a computer using special programs (CmapTools, Inspiration 10, Kidspiration Maps, iMindMap, TheBrain, Webspiration Classroom, XMind), or simply on a piece of paper. The second option is preferable, as in this case the content of the mind map is even better remembered, and it becomes truly unique. By means of the use of colors, drawings, and spatial connections, any information is perceived, analyzed, and memorized much faster and more efficiently. It turns out that mind maps are a natural product of our brain. Through the creation of such maps, the thinking process is graphically expressed. Mind maps are a very powerful technic for unlocking the potential hidden in the brain. Therefore, this method can be used in any field of human activity.

Let's move on to consider the principles and goals for creating mind maps:

A teacher can use mind maps to:

- explain a new topic;
- systematize and structure information;
- organize and conduct control;
- generalize knowledge;
- encourage communication;
- create basic algorithms of actions, etc.

The student can:

- systematize their knowledge;
- use it as a plan for their speech.

In their work N. Nasr-Esfahani *et al.* (2021) mentioned that if you were interested in mind maps, you should carefully read the recommendations for their preparation and the algorithm for their creation. A mind map can be described as an associative network consisting of images and words. And since the word is the main unit of any language, it is very important to constantly expand students' vocabulary. The student recalls or finds the right word, which activates memory and thinking processes. By presenting each word in the form of a picture (the right hemisphere is not guided by words, but mainly by images and spatial structures), he uses a complex set of skills that are characteristic of both the left and right hemispheres of the brain (Bhattacharya & Mohalik, 2020). The use of pictures and images makes it easier to translate, understand and memorize the meaning of a word. Anything that seems unusual, colorful, or funny is much easier to remember and comes to mind faster than things that are banal and boring (different colors and pictures are used for this purpose), and different arrows show the connections between concepts. This is the basis of the power of mind maps. Thus, imagination, creative thinking, and types of memory are involved in their creation: Visual, auditory, and mechanical, which allows you to memorize words. Mind mapping differs from other methods of organizing material in that students are always involved in the process. This is one of the methods of cognitive visualization. Cognitive visualization is not the same as visualization or an illustrative method, because it is a "transformation, rethinking" of the subject of study and is aimed not at illustrating the material learned, but at developing cognitive abilities, analytical and critical thinking.

Here are the main advantages of using mind maps in teaching (Hudyma, 2022):

1. They allow you to summarize the main ideas of the educational material;

2. They help to synthesize and identify the main ideas, topics and relationships (especially useful for students without systematization skills);

3. The visual component improves understanding and recall of the material.

It does not matter who creates a mind map: a teacher or a student/group of students – this was established by Horton's research (Lavrenova, 2019). However, it is more effective when students participate in the creation of the map, and who draws it is not so important. For example, you can create a mind map with the teacher's help with the whole group, as long as all participants are involved in the process. If students study a mind map prepared by a teacher, the effect size is half as large. R. Al-Jarf (2021), Z. Zhang *et al*. (2023) had found that mind maps were most effective for students with low levels of language development. M. Luangkrajang (2022) mentioned in these works that this was due to the fact that, firstly, students were involved in its preparation, and secondly, in reducing the cognitive load on them, which occured due to the placement of map elements in two-dimensional space with the highlighting of key concepts, greater clarity and interconnections. In order to turn a student into an active person who, under the guidance of teachers, discovers and learns new knowledge, there are new teaching strategies that are consistent with the student's learning methods: the starting point of the lesson is the student's own experience, which covers issues and actions that concern him or her; the lesson uses a combination of activities related to different learning methods preferred by the student: visual, verbal, practical; the lesson involves active participation of the student in the learning process through experiments and modeling.

The development of permanent learning competencies and creative skills of students and teachers determines the effectiveness of education. The student can actively engage in the learning process by participating with the teacher in the development of mind maps. Thus, learning outcomes are meaningful when a person consciously and explicitly connects new knowledge with the relevant concepts they already possess. When meaningful learning occurs, it produces a series of changes in our entire cognitive structure, modifying existing concepts and forming new connections between concepts. This is why purposeful learning is long-lasting and powerful, whereas environmental learning is easily forgotten and not easily applied to new learning situations or problem solving, which the current scientific curriculum is so protective of (Kruk *et al.,* 2023).

Mapping can be used for several purposes (Fig. 2):

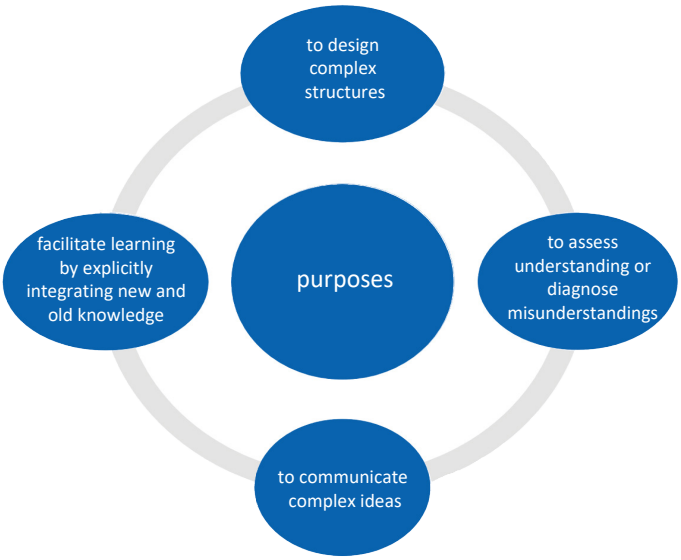

Figure 2. Purposes for using mind maps

Source: developed by the authors

The main advantage of this method is the provision of a powerful representation technic that shows complex relationships, respectively establishing a transparent connection, between different concepts (Pashchenko, 2020). The role and importance of mapping technologies in professional training can be represented by the model of a virtual learning environment, which can now be used not only in online, distance education or blended education, but also in the system of traditional professional training, of course, with interactive content. One of the main uses of mind maps is to create visual schemes or diagrams to represent and organize ideas, vocabulary, grammatical structures, or thematic concepts. In the Practical English course, students can use mind maps to create a schematic representation of the material they are learning, which will help them navigate the topic and understand the relationships between different aspects of the language. Mind maps can also be used to activate speaking skills.Students can be asked to create them

on a particular topic, such as "My favorite places", "Hobby" or "Student's life" etc., and then use them as a basis for monologue or dialogic speech. This will allow higher education seekers to better structure their thoughts and use English to express themselves. In addition, mind maps can be used to activate vocabulary. Students can be asked to create mind maps on a specific topic, such as "Food", "Traveling", or "Sport", and fill them with new words, phrases or associations related to this topic. This will contribute to a deeper learning of vocabulary and the development of associative thinking. It is necessary to consider more examples of the use of mind maps in "Practical English course" (Fig. 3):

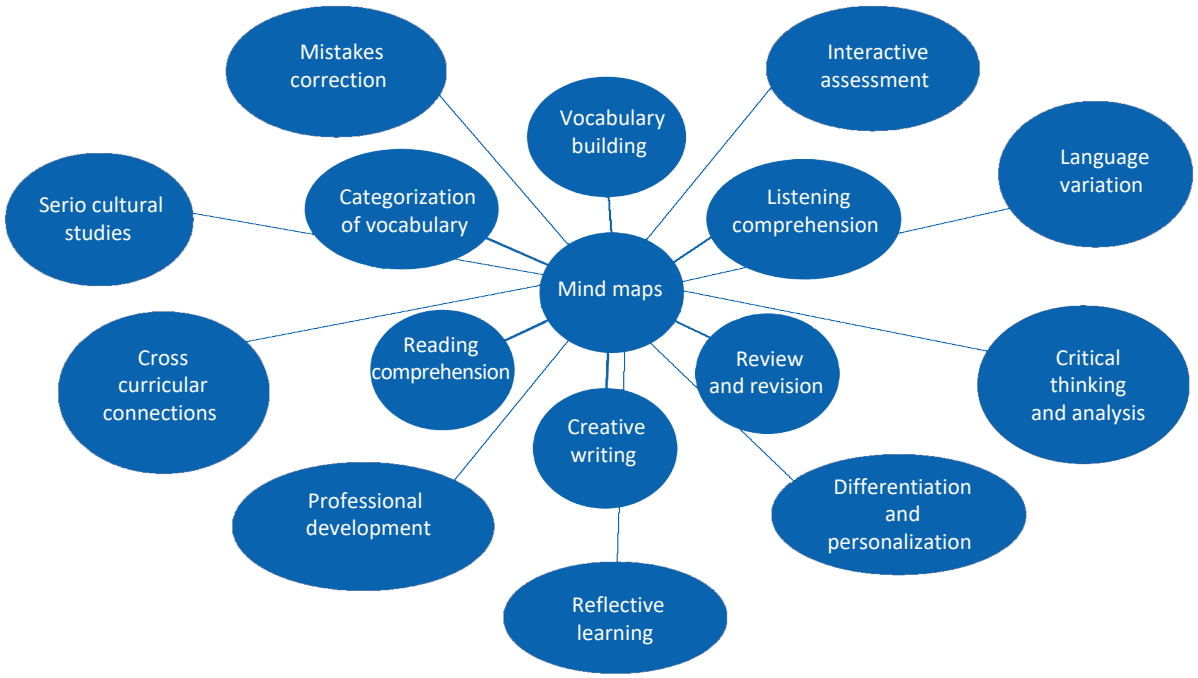

Figure 3. Use of mind maps in "Practical English course"

Source: developed by the authors

Vocabulary building. Mind maps are great for vocabulary building (Liu, 2019). The higher education seekers can create a central theme or subtheme and branch out with related words, synonyms, antonyms and phrases. This technique encourages the exploration of new vocabulary and the creation of associations, promoting a deeper understanding of word usage and context, and in the process, vocabulary acquisition, which is the goal of this technic. Students can visually explore and expand their vocabulary by making connections between words and expanding their vocabulary range.

Categorization of vocabulary. Mind maps help in categorizing vocabulary. Teachers ask students to create mind maps that group words into themes or semantic fields. This approach helps to see the connections between related words, helps to expand vocabulary and improve lexical organization in the work on mastering English. Vocabulary retention: Mind maps help you memorize and review vocabulary. Teachers guide students in creating mind maps that categorize and review vocabulary from previous lessons or units. The visual and organized nature of mind maps helps improve vocabulary retention and suggests how to memorize words more effectively. Mind maps for idioms and phrasal verbs. Mind maps can be used to learn idioms and phrasal verbs in English. They illustrate common idiomatic expressions and phrasal verbs. Students can refer to these mind maps to deepen their understanding of these linguistic elements and improve their fluency. Note that the richness of the mind maps allows them to be adapted to different contexts and topics covered in the English language course. Teachers adapt the use of mind maps to the specific needs and preferences of their students, which promotes active learning, critical thinking and effective communication in the Practical English course.

Mind maps for speaking practice. Mind maps can be used to practice speaking. In this case, you create mind maps with discussion prompts or phrases to use. Students use these cards as a guide to formulate their thoughts and engage in topic-specific dialogues, thereby improving their oral communication skills. In addition to learning vocabulary, which is the most common use of mind maps, you can use this technic to develop other English language skills. Let's move on to consider them. Pronunciation and phonetics. Mind maps can be used to improve pronunciation and teach phonics. Teachers can create mind maps that illustrate phonetic symbols, sounds, and pronunciation rules. Students can refer to these visual representations to practice and improve their pronunciation skills. Mind maps can help you practice pronunciation by visually representing phonetic features and patterns. They can highlight

certain pronunciation rules, sounds, or phonetic symbols. Students can refer to these maps both in class and at home to improve their pronunciation.

Listening comprehension. Mind maps help develop listening comprehension skills. You can use them to check the audio you've listened to or watched. By using keywords, phrases and visual cues, learners can better understand and remember the main ideas, details and connections presented in listening materials. Thus, mind maps can improve the development of listening skills. Teachers create mind maps that summarize the audio or video material, including key ideas, details, etc. Students can use these mind maps to check their listening comprehension while improving their ability to understand spoken English.

Visualizing grammar. Mind maps can help in visualizing grammar concepts. For example, a learner can create a mind map for tense forms, where each branch represents a specific tense. They can further expand each branch with examples, sentence structures, and tense markers. This visual representation helps to understand the patterns and uses of different grammatical structures. They can also be used to review and reinforce grammar by illustrating grammar structures, rules, or exceptions. Students can refer to these maps to review and reinforce their understanding of grammar concepts. Mind maps also facilitate the learning of language structures. Teachers can create maps that deconstruct complex sentence structures, grammar rules, or sentence patterns. Learners can visually observe the connections and relationships between different elements, which contributes to their understanding and learning of language structures.

Reading comprehension. Mind maps can be useful in working on reading comprehension. Students can create them to highlight key points, list characters, or mark events in a text. This technique improves comprehension, develops critical thinking, and facilitates classroom discussion of the material. Mind maps also help to analyze literary works in English. Teachers guide students to create mind maps related to the theme, characters, storylines, and literary devices used in prose, poetry, or plays. This visual representation allows them to delve deeper into text analysis and develop critical thinking skills. Consequently, students can refer to these maps to better understand and analyze the content, improving their reading comprehension abilities. Presentation and public speaking skills: mind maps can be used as a visual aid for presentations. Teachers can encourage students to create mind maps that outline their main points, with supporting details and transitions. This approach helps to organize their thoughts, make more structured presentations, and improve their public speaking skills. Note that these maps outline the structure, key points, and visuals for their presentations. This visual organization helps students deliver more organized and consistent presentations, improving their communication skills and public speaking abilities.

Review and revision. Mind maps are an effective technic for reviewing and summarizing class content. Instructors can create maps that are presented at the end of a lesson or chapter that has been studied, highlighting key concepts, vocabulary, and connections made during the course. This visual summary helps learners to consolidate their knowledge and makes it easier to repeat what they have learned, bringing it up to date.

Group cooperation. Mind maps can facilitate collaborative learning. Students can be given group assignments where they work together to create a mind map on a specific topic. This activity encourages teamwork, promotes communication and develops negotiation skills as students collaborate to organize their ideas and present them to an audience, which creates a supportive and interactive group environment.

Critical thinking and analysis. Mind maps can be used to develop critical thinking skills. You can suggest creating mind maps that analyze and compare different literary works, characters, or themes. By exploring the relationships and connections between different elements, students develop higher-level thinking skills and engage in deeper analysis and interpretation. Mind maps also stimulate creative thinking and require brainstorming. Teachers use mind maps as prompts for creative writing, problem-solving scenarios, or creative use of language. These activities promote creativity, critical thinking, and linguistic flexibility. Mind maps for reflection and goal setting: Mind maps are used for reflection and goal setting in English language learning. They allow students to reflect on their progress, strengths, areas for improvement, and set goals for future language development. This reflective practice helps students to take responsibility for their learning and motivates them to continuously improve.

Preparing for an exam (test control). Mind maps are a valuable tool for exam preparation. Instructors encourage students to create mind maps that summarize key topics and different concepts. This visual representation helps them to review and memorize information more efficiently, facilitates the repetition and assimilation of previously learned material, and contributes to exam success. Teachers use them to quickly review what they have learned and summarize key information, illustrating the course with examples. This visual control technic helps students to consolidate their knowledge and prepare more effectively for the test.

Socio-cultural studies. Mind maps are used to study socio-cultural topics related to the English language. The teacher can ask students to create mind maps that show different aspects of English-speaking countries, such as traditions, customs, landmarks, or famous figures. This activity broadens students' cultural awareness and promotes intercultural understanding and socio-cultural competence.

Cultural contextualization. Mind maps can be used to contextualize language learning in a cultural context. Teachers create mind maps that reflect cultural aspects related to English, such as idioms, proverbs, or social norms. This cultural integration improves learners' cultural competence and understanding of language use in real-life situations. Mind maps can also facilitate research on cultural

topics related to the English language. They can be used to delve into cultural aspects such as traditions, customs, holidays, or social norms of English-speaking countries. Students can engage in discussions and activities based on these mind maps, promoting cultural awareness and intercultural communication skills.

Creative writing. Mind maps also inspire creative writing of essays and more. Teachers use mind maps to create stories or plots using the characters on the map, to invent different situations with them, to think of conflict resolution, etc. This technique helps you visualize your ideas and structure your stories, fostering creativity and improving your writing skills. Mind maps can serve as a technic used before writing any text to generate ideas and structure the writing. Mind maps outline the main points, supporting details, and organization of their writing. This visual representation helps students to organize their thoughts and create a well-structured piece of writing.

Correction of mistakes. Mind maps are used for mistake correction activities. Teachers can ask students to create mind maps that identify common mistakes or language errors. They can then be used to analyze and correct it, providing alternative forms or explanations. This work promotes a deeper understanding of language use and develops self-education skills.

Language variation. Mind maps can help explore language variation and cultural diversity. Teachers create mind maps that showcase different dialects, accents, or regional variations of English. Students can discuss and compare linguistic features, which in turn fosters respect for linguistic diversity and cultural inclusiveness.

Interactive whiteboards. Mind maps can be integrated with an interactive whiteboard. Teachers use such technology to create dynamic mind maps during classroom discussions or presentations. This interactive approach allows for real-time changes, additions, and annotations, engaging students and creating a collaborative environment.

Reflective learning. Mind maps encourage reflective learning practices. Teachers can ask students to create mind maps that reflect their language learning journey, highlighting achievements, challenges, and future goals. This reflective exercise promotes metacognitive awareness and can help develop effective learning strategies. Teachers can also use these technics in their own reflective practice, where they can create mind maps to reflect on their teaching strategies, lesson plans, and classroom management techniques. This self-reflection allows them to evaluate their approaches, identify areas for improvement, and help them improve their own teaching practice. By implementing mind maps in Practical English, teachers create a dynamic and engaging learning environment that accommodates a variety of learning styles and promotes active participation. Mind maps serve as powerful visual technics that promote comprehension, organization, creativity, and critical thinking, and contribute to students' overall language development.

Authentic materials. Mind maps are used to study authentic materials in English. They include authentic texts such as newspaper articles, magazine excerpts, or online resources. Students can visually analyze and extract key information, vocabulary, and language structures from these materials, improving their comprehension skills and familiarity with real-world English usage.

Cross-curricular connections. Mind maps can facilitate cross-curricular connections in English language learning by connecting English with other subjects such as science, history, or geography. This interdisciplinary approach helps students make connections, apply language skills in different contexts, and develop a broader understanding of concepts.

Technology integration. Mind maps can be integrated with technology technics and platforms, including using online software or apps to create interactive and collaborative mind maps. This allows students to access and contribute to mind maps digitally, promoting digital literacy and providing opportunities for distance or blended learning.

Differentiation and personalization. Smart maps can support differentiation and personalization in English language learning. Teachers can ask students to create customized maps based on their interests, learning styles, or language goals. This personalized approach allows higher education seekers to take responsibility for their learning and interact with the language according to their preferences and needs.

Interactive assessment. Mind maps can be used as assessment technics in English language learning. Teachers design assessment tasks and students create mind maps to demonstrate their understanding of concepts, vocabulary use, or language structures. This form of interactive assessment encourages active participation, critical thinking, and creative expression.

Professional development. Mind maps can also be used for professional development in English language teaching. Teachers can create mind maps to organize and explore new techniques, outcomes, or pedagogical resources. This professional development technic helps to continuously learn, reflect and keep abreast of current trends in language education. It should be noted that the versatility of mind maps allows them to be adapted to different aspects of the Practical English Course, meeting the needs of both teachers and students. By incorporating mind maps into their teaching strategies, teachers can create a learner-centered and engaging environment that promotes language acquisition, critical thinking and creativity.

Co-creation of mind maps. Mind maps are used as technics for collaborative work in groups. In this case, teachers invite learners to work together to create a map on a specific topic or skill. This collaborative approach encourages teamwork, communication, and the exchange of ideas, promoting a cooperative learning environment.

Mind maps for intercultural communication. Mind maps can be used to teach intercultural communication in the Practical English class. They help students delve into cultural aspects, values, or norms of communication in different English-speaking countries. The objective of this type of work is to discuss and compare cultural elements

to develop intercultural competence and effective communication skills. Mind maps offer a versatile and dynamic approach to learning English for Dummies, serving a variety of skills, topics, and learning objectives. By integrating mind maps into their teaching strategies, teachers can create engaging and interactive learning programs that will promote language acquisition, critical thinking, and creativity in their students. The use of mind maps can also help teachers evaluate the learning process. They can assess student achievement by identifying misconceptions and missing concepts. Mind maps are gaining popularity as a problem-solving technic in education. Concept mapping can be used to enhance the problem-solving phases that generate alternative solutions and options. Since problem solving in education is usually carried out in small groups, learning should also benefit from the properties that improve communication and concept mapping (Borysova, 2020).

Creating and using mind maps in English classes allows you to: create motivation to master a foreign language as a means of communication, organize individual, group and collective activities of students, construct educational content in accordance with age-specific features, to implement a differentiated approach, organize independent work, organize project activities, to teach students to use dictionaries, reference books and other sources of written and oral information in order to find the necessary meanings, decipher dictionary definitions, to develop students' creative and intellectual abilities, thinking, memory, and intuitive abilities.

Mind maps can be used to (Wei & Weitong, 2023):

1. Work with vocabulary material (introducing new vocabulary, consolidation of new vocabulary, control of vocabulary);

2. Work with grammar material. You can make mind maps of the grammar material you have learned in order to learn and memorize it;

3. Work with textual material (making plans for retelling texts, etc.);

4. Teaching oral monologue speech with the help of verbal supports;

5. Repetition of the studied material. It is effective to use mind maps when preparing for an exam, as it takes less time to memorize and repeat information, and its reproduction becomes more meaningful;

6. Presentation of the results of project activities. You can depict the entire process of creating a project in the form of mind maps, or only the results of the project, new ideas, etc., and then explain everything that is depicted on the map during the presentation of the project;

7. Conducting a brainstorming session. With the help of maps, you can create hundreds or more ideas that are quickly generated, original and effective;

8. Holding a discussion, debate.

Thus, the concept map as an effective means of structuring information helps the teacher in preparing for classes, planning educational material, and making decisions. In addition to familiarizing themselves with the theory and practice of mind maps, teachers can use them to solve a number of their own practical problems, making teaching and, accordingly, the learning process easier and more enjoyable. The use of such maps in the classroom can take different forms: use ready-made mind maps depicted in textbooks or on posters, prepare your own mind maps in the form of presentations or reference notes for the class, build them in the classroom as you go along, organize various types of individual and group activities for students to use ready-made mind maps. Different types of mind maps can be used in the Practical English course. It all depends on the topic, purpose and objectives of the lesson. We consider it appropriate to mention them:

Mini-maps for visualizing, for example, a phrasal verb. They can be quickly drawn in class. The verb is written in the center, the prepositions with which it is used are drawn away from it, and the new meaning that the verb has acquired is written under the prepositions. If you need to provide a translation, you should write the English and Ukrainian words in different colors so that you can easily focus on one or the other if necessary. *Vocabulary maps on a particular topic.* Then these cards look like huge suns with many rays. For some, they may look more like trees. The correctness of the mind maps and their external attractiveness come with experience, as students are faced with the task of collecting all the vocabulary on one topic together, dividing it into groups (if possible), and showing these connections graphically (many have difficulty doing this). It is recommended to write out not just words, but phrases by topic. Under each word or phrase, a translation is written with a different color pen or pencil. The use of newly learned vocabulary in the cards contributes to its more successful assimilation and further use in the process of oral communication: dialogic or monologue. *Support maps for retelling the text.* The title of the text or its main idea is written in the center, then key phrases that logically reveal this idea are written out in rays and a certain sequence is built between them with the help of arrows and lines. This type of map is used in the classroom to draw up a plan for retelling and a mini-presentation on a given topic. *Repetition maps as homework can be used to repeat vocabulary and grammar.* If the mind map is drawn as a house, then instead of translating words, you can use drawings, diagrams, icons, cut-out pictures, i.e. you need to add a personal component.

By using mind maps, you can track the learning of the topic by each student. To do this, it is worth checking individual maps that have been drawn up independently (as homework). If important components of the topic are missing, it is clear that the student has not fully mastered the necessary material. Working with such technics is very effective. So, when making mind maps, students do a lot of mental work: they absorb information, analyze it, make generalizations, and highlight the main, essential things. As a result, solid knowledge is formed for the formation of communicative competence. In such a lesson, purposeful learning activities are conducted, in which the

student consciously sets goals and objectives and creatively achieves them, thus achieving high quality education. It should be emphasized that the advantages of using mind maps in the educational process, in particular in teaching a foreign language, namely the development and improvement of foreign language lexical and communicative competences, are: helping students to discuss and create new ideas; encouraging students to discover new concepts and the provisions that combine them; allowing students to express thoughts, views and present information more clearly; helping students to integrate new concepts with already studied, known ones; allowing students to enrich their knowledge of any subject.

CONCLUSIONS

The scientific novelty of this study is the development of a recommendation on the use of mind maps in the "Practical English Language Course". Thus, if mind maps are created correctly and clearly, they become a powerful tool for students to achieve a high level of cognitive performance. For the teacher, a mind map is not just a teaching technic, but also an ideal way to assess the growth of students' achievements and knowledge. When students create mind maps, they repeat concepts using their own words and match incorrect ideas and concepts. Teachers, on the other hand, are able to see what students do not understand, providing an accurate, objective way to assess areas where students do not yet fully understand a concept. Designing a model for the development of oral and written communication in a foreign language based on concept mapping follows the following logic: defining the boundaries of the model; defining the purpose and objectives of the design, their correlation with the goals and objectives of the designed process; defining the content, methods, techniques, means, forms of the process being modeled; identifying the organizational and pedagogical conditions necessary to achieve the goal of the designed model; defining the main result to be achieved in the implementation of this model, justifying the

Mind maps help to synthesize and highlight the main ideas, topics and relationships (especially useful for students without systematization skills). At the same time, the visual component improves the understanding of the learning material and its recall. The use of such technics allows students to enrich their knowledge on any topic and evaluate the information received, etc. The use of mind maps can be used to track the mastery of a topic by each student. To do this, it is worth checking individual maps that are drawn up independently (as homework). If important components of the topic are missing, it is clear that the student has not fully mastered the necessary material. Working with such technics is very effective. In the process of teaching English, teachers are encouraged to use mind maps to solve a number of their own practical problems, making teaching and, accordingly, the learning process easier and more enjoyable. The use of mind maps in the classroom can take various forms: use ready-made mind maps depicted in textbooks or on posters, prepare your own samples for the class in the form of presentations or reference notes, build them in the classroom during the presentation of the material, organize various types of individual and group activities of students using ready-made mind maps. This contributes to a more interactive and engaging learning environment that allows learners to visualize and combine different elements of the language, which leads to an improvement in language proficiency. This study does not fully reveal the subject of our search, in particular, it requires an additional separate consideration of the issue of using mind maps for the development and improvement of foreign language communicative competence of higher education seekers.

ACKNOWLEDGEMENT

None.

CONFLICT OF INTEREST

None.

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Інтелектуальні карти як дієвий інструмент на заняттях з «Практичного курсу англійської мови»

Анотація. У статті розглядається питання використання інтелектуальних карт на заняттях з «Практичного курсу англійської мови». Наголошено, що вони допомагають структурувати, аналізувати, розуміти, запам'ятовувати необхідний матеріал. За їх допомогою викладачі можуть пояснити нову тему, систематизувати інформацію, здійснювати контроль, узагальнювати вивчене, спонукати до спілкування, створювати опори. Метою дослідження було розглянути поняття «інтелектуальні карти» та виокремити можливість їх застосування при вивченні освітнього компоненту «Практичний курс англійської мови». Методами дослідження був аналіз, систематизація та узагальнення наукових розвідок, а також абстрагування, ідеалізація та логіко-структурний аналіз використання інтелектуальних карт у навчальному процесі. Зауважено, що цей засіб є дієвим і для студента, зокрема, для систематизації знань, для підготовки до заняття, до тестового контролю тощо. Студент може активно долучитися до навчального процесу, беручи участь разом із викладачем у розробці інтелектуальних карт. Зазначено, що одним з основних застосувань інтелектуальних карт є створення візуальних схем або діаграм для ілюстрування теми, словникового запасу, граматичних структур або тематичних концепцій. На заняттях з «Практичного курсу англійської мови», здобувачі вищої освіти можуть використовувати інтелектуальні карти для створення схематичного зображення вивченого матеріалу, для активізації мовленнєвих навичок, для роботи з лексичним матеріалом, з граматичним матеріалом, з текстовим матеріалом, для представлення результатів проєктної діяльності, проведення мозкового штурму, проведення дискусії, дебатів тощо. Викладачі адаптують використання інтелектуальних карт відповідно до конкретних потреб і вподобань своїх студентів, що сприяє активному навчанню, розвитку критичного мислення та ефективній комунікації на занятті. Наголошено, що на заняттях можна використовувати готові інтелектуальні карти, подані в підручниках або на плакатах, однак можна приготувати до заняття власні зразки у вигляді презентацій або опорних конспектів, у процесі викладу матеріалу будувати їх на безпосередньо занятті, організувати різні види індивідуальної і групової діяльності учнів з використанням готових концептуальних карт. Зазначені їх переваги у застосуванні як викладачами, так і здобувачами вищої освіти

Ключові слова: картування; навчання англійської мови; ефективний засіб; візуалізація; критичне мислення

Vol. 2. No. 2. 2023 Scientia et societus
Received: 24.07.2023.
Revised: 27.10.2023.
Accepted: 12.12.2023.
Journal homepage: https://ses.journal.in.ua/index.php/ses/issue/view/4

UDC 378.016:91]:374.7-022.316 *DOI: 10.69587/ss/2.2023.110*

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Methodological approaches to preparing future geography teachers for continuous professional development

Abstract. In a world where rapid changes are taking place in society, economy, and technology, it is necessary for future geography teachers to be oriented towards the latest trends and be ready to adapt to them through continuous professional development. Accordingly, the scientific article aimed to determine the essence and characteristics of the main methodological approaches to preparing future geography teachers in the context of their continuous professional development. The study employed various research methods, including theoretical analysis of psychological-pedagogical sources, description, synthesis, systematization, abstraction, comparison, and generalization of data. These methods helped to identify the main aspects of methodological approaches to preparing future geography teachers for continuous professional development. They are also used to create a teaching model that contributes to the continuous development of participants in the educational process. The research reveals methodological approaches to preparing future geography teachers for continuous professional development. The conceptual methodology and research objectives, features of methodological approaches to preparing future geography teachers in conditions of continuous professional development, are determined. The article reveals the essence of individualization in the preparation of future geography teachers for continuous professional development. The specifics of the main approaches (systemic, personal, synergistic, activity-based, axiological, and competency-based approaches) in preparing future geography teachers for continuous professional development are characterized. Emphasis is placed on the importance of developing readiness of future geography teachers for continuous professional development in professional training in accordance with each methodological approach. Attention is focused on the importance of transitioning from classical models of educational preparation of future geography teachers to systems that prepare professionals capable of working in new circumstances and ready for lifelong learning, upbringing, and continuous professional growth. The practical value of the research lies in highlighting important methodological approaches and innovative methodologies that can be used to adapt approaches to organizing the educational process for the specialty 014.07 Secondary Education (Geography) and other specialties for preparing future teachers in the face of modern challenges in education

Keywords: theory and methodology of professional education; pedagogical system; self-education; self-improvement; methodological approach; systemic approach; educational-professional program

INTRODUCTION

The main challenges of modernizing the higher education system in Ukraine include establishing the essence, methodology, and perspectives of continuous professional growth and qualification enhancement of contemporary teachers as competitive specialists, adapted to modern social and cultural conditions, capable of self-improvement and lifelong self-development. Researching the methodological aspects of teacher training is crucial for adapting the educational process to contemporary challenges. Changes in socio-economic, technological, and cultural spheres define new requirements for geography teachers. Changing teaching approaches, implementing innovations, and

Suggested Citation:
Nosachenko, V. (2023). Methodological approaches to preparing future geography teachers for continuous professional development. *Scientia et societus*, 2(2), 110-118. doi: 10.69587/ss/2.2023.110.

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using modern teaching methods require geography teachers to continuously enhance their professional competencies, and examining aspects of continuous professional development in the context of geographical education becomes a relevant issue in modern higher professional education.

The importance of professional training for future geography teachers for continuous professional development and the necessity of improving organizational, pedagogical, and methodological conditions in the context of modern requirements for higher education students and teachers have significantly increased. Reforming school geographical education to meet the requirements of the New Ukrainian School (NUS) demands updating not only content but also teaching methods, forms, and tools aimed at the comprehensive development of students' independence and research activity, strengthening the visuality of education, and more. The issue of a modern teacher's readiness for continuous professional development in the context of the rapid progress of scientific-informational and telecommunication environments is extremely important and one of the most discussed in modern national and international psychological-pedagogical research. This requires teachers not only to update their knowledge and skills but also to develop flexibility and adaptability to rapidly changing conditions, which is crucial for effective teaching in the modern world. The study of a significant number of scientific works confirms that the issue of preparing students for continuous professional growth attracts the attention of numerous researchers. This indicates the importance of this problem in the context of modern education and professional development. Specifically, this relates to the necessity of developing effective teaching methods and approaches that would contribute to forming students' readiness for continuous improvement of their professional skills and knowledge. This is explored in the research by L.P. Vishnikina (2018), dedicated to the problems of professional training of future teachers, including geography, and the formation of individual elements of readiness for professional activity.

In the scientific work by B. Pasang & S. Najib (2022), the key elements and characteristics of competency-based tasks applied in the preparation process of future geography teachers in higher education institutions are examined. The article by V. Nosachenko (2022) defines the place of professional training of future geography teachers and theoretically substantiates the pedagogical system of preparing future geography teachers for continuous professional development. O. Chubrei's scientific work (2020) is devoted to analyzing the peculiarities of professional training of future geography teachers in foreign countries and identifying promising concepts for implementation in Ukraine amid educational transformation. V. Frytsiuk's scientific work (2017) identifies and discusses the formation of a sustainable desire for knowledge in students, providing students with access to necessary resources, innovative direction of educational content, forms, methods, and means of teaching for preparing future geography teachers for continuous professional development. In the article by V. Pasternatskyi *et al*. (2023), the importance of self-education of teachers in the pedagogical context is defined and justified, the conditions for the effectiveness of teachers' self-education in the modern education system are highlighted, and the structure of teachers' readiness for self-education in postmodern society is presented. I. Prokopenko's scientific work (2021) focuses on the system of preparing future teachers to promote interaction with students of secondary educational institutions, particularly through the development of effective teaching methods and approaches that would contribute to forming students' readiness for continuous improvement of their professional skills and knowledge.

The question of how to cultivate the readiness of future geography teachers for continuous professional development in higher education institutions requires in-depth theoretical analysis and scientific consideration. This includes studying contemporary pedagogical theories, teaching methods, and professional development strategies. Moreover, it is necessary to consider the possibility of applying methodological approaches in the process of preparing future geography teachers, which can contribute to effectively shaping their readiness for continuous improvement of their professional competencies. Therefore, the main aim of this work was to uncover key aspects, analyze, and systematize methodological approaches used during the professional training of geography teachers.

MATERIALS AND METHODS

The research methods utilized encompassed theoretical analysis of psychological and pedagogical research sources, description, synthesis, systematization, abstraction, comparison, and generalization of analyzed data, as well as methods of pedagogical modeling and forecasting. Theoretical analysis of psychological and pedagogical research sources was conducted through the study of scientific and pedagogical literature, dissertations, and publications. This facilitated understanding of existing theories and approaches to the preparation of future geography teachers for continuous professional development. The study of these sources enabled the assessment of the current state of the issue and identification of gaps in existing research. Additionally, this method was employed to reframe complex concepts into simpler components for better understanding and contextualization within the framework of continuous professional development in geography teacher education. The use of theoretical research methods such as description, synthesis, systematization, abstraction, comparison, and generalization was a crucial stage in processing information obtained through theoretical analysis. Description allowed for a detailed presentation of the main trends identified during the analysis, including characteristics of various methodological approaches, their peculiarities, and application methods in the preparation of future geography teachers. Synthesis was used to integrate different parts of the analyzed information into

a unified whole. Systematization facilitated the organization of acquired information, enhancing its comprehension and analysis. Abstraction was employed to highlight the most important characteristics and properties of methodological approaches in scientific and pedagogical research, helping to focus on key aspects of scientific publications and separate distracting details. Comparison enabled the identification of similarities and differences among various approaches, which could be useful in selecting the most effective preparation methods. Generalization allowed for the formulation of main conclusions from the obtained results and determination of directions for further research.

The use of these methods facilitated the integration of methodological approaches (systemic, personal, activity-based, axiological, synergetic, competency-based) and ideas for preparing future teachers, creating a pedagogical system conducive to continuous professional development. This enabled the identification of key aspects of preparing future geography teachers for continuous professional development and determination of directions for further research. Pedagogical modeling and forecasting methods were employed to develop a model for preparing future geography teachers for continuous professional development. Material was collected to refine the model, taking into account identified theoretical approaches. The model will be used for implementation in the education process of higher education institutions in Ukraine for the preparation of students specializing in 014.07 Secondary Education (Geography) at the bachelor's and master's levels. This will help improve the quality of preparation for future geography teachers and their readiness for continuous professional development. The use of various research methods helped identify key aspects of methodological approaches to preparing future geography teachers for continuous professional development, determine directions for further research, and reconsider the developed preparation model to enhance its effectiveness during implementation in the educational process of Ukrainian universities.

RESULTS AND DISCUSSION

Continuous professional development is realized through the interaction of formal and informal education, based on a new virtual reality – an innovative environment. In this environment, creative ideas and practically oriented pedagogical research accumulate, cooperation and communication take place, and new forms of scientific and methodological consulting and innovation emerge. Preparing future geography teachers for continuous professional development is a purposeful process aimed at enhancing their professional motivation, developing personality traits such as willpower, and fostering self-awareness, self-education, and self-realization in the academic environment. This process also involves the formation of critical thinking skills, adaptation to changes, and lifelong learning, all of which are crucial for successful professional activity in the modern world. Here, students acquire necessary professional skills and develop the ability for independent improvement in their professional sphere. Continuous professional development of future geography teachers includes self-education, self-cultivation, self-improvement, and self-development, evolving through formal, informal, and non-structured education. The readiness for continuous professional development of future geography teachers must be formed by creating positive motivation within higher education institutions, fostering a conducive environment for continuous professional development, emphasizing innovation in educational content to prepare for continuous professional development, and stimulating individual research.

Considering the theoretical rationale, the essence of its individual components has been identified, and pedagogical conditions for the system of preparing future geography teachers for continuous professional development have been determined, based on methodological approaches to forming the readiness of future geography teachers for continuous professional development (Nosachenko, 2022). One of the main tasks in planning scientific and pedagogical research is the selection of methodological approaches that will determine its foundation. This problem can be successfully addressed by adhering to a number of conditions:

- methodological approaches used in the research should correspond to the goals and objectives set for the research;
- to obtain an objective and comprehensive understanding of the phenomenon under study, it is recommended to apply not only one but several approaches corresponding to different levels of methodology;
- the group of methodological approaches used in the research should not contradict each other;
- the methodological approaches used in the research should complement each other, allowing the object to be considered from all possible angles and in the context of all interrelationships.

A methodological approach includes a set of ideas shaping the researcher's scientific worldview, the main principles of his research strategy, and the methods and procedures that allow this strategy to be implemented in practice. Contemporary pedagogical research is based on numerous methodological approaches representing various research directions and reproducing the specifics of particular scientific research activities in the field of pedagogy (Guo *et al.*, 2022). The main methodological approaches commonly used in scientific research on the theory and methodology of professional education include systemic, personal, activity-based, axiological, synergetic, and competency-based approaches (Zhyhir, 2016).

The authors of this work consider the *systematic approach* to be fundamental in preparing future geography teachers for continuous professional development. The systematic approach is a methodology that utilizes a set of methods for studying objects as systems, considers the object as a combination of elements interacting with each other and the surrounding world, and is based on an understanding of the systematic nature of knowledge. Characteristics defining a system as an object of scientific research

include: purposiveness, implying the presence of mechanisms to ensure the system's stability; integrity, presenting the system as an organic unity of its components, where a change in one component results from a change in another; interrelation of tasks solved within each individual component; hierarchy, involving the consideration of each element of pedagogical competence formation as a subsystem within a higher-order system – the system of professional pedagogical training; dynamism, during which the content of system components changes in response to societal needs, leading to qualitative changes in the expert's personality, adapting to changes in the external world while preserving its uniqueness (Kobernik, 2013; Dupak, 2015; Stepanchenko, 2017).

The systematic approach is recognized as a methodological direction in science aimed at creating research methods and constructing complex systems of various kinds. The use of a systematic approach in researching any pedagogical system requires establishing correspondence between the properties of the educational system and societal needs. The systematic approach encompasses various methods of cognition, such as systematic analysis, systematic programming, and systematic design, which serve for researching and modeling objects or their models. This allows for the analysis of all components of the system of professional training of future experts in professional education, identifying relationships between them, understanding the functions of individual system elements, and mechanisms of their functioning (Shapran, 2008; Meshko, 2013). The systematic approach emphasizes the importance of certain ideas and principles. This includes professional orientation, a scientific approach, systematic approaches, individualized approach to each student, active involvement of students in the learning process, academic interaction, harmony of structural elements of the educational process. Additionally, the use of modern technologies for preparing future geography teachers is important. Moreover, this approach also includes innovativeness, flexibility, and adaptability to changing conditions and societal needs, which are integral components of the readiness of future geography teachers for continuous professional development.

A systematic approach allows to create indivisible integration models and the study of basic functions, components, elements, their interrelationships and relations, as well as factors necessary for the existence of the system and conditions for functioning both in an inert and active plan. Understanding the interrelation of facts and phenomena in the educational process, as well as the interaction of situations, components of learning and education, needs to be considered by studying the components of the entire system. The teacher's educational activity should be structured as a dynamic system. Developing systematic thinking contributes to the ability to build and adapt professional activities, find optimal combinations of pedagogical tools, forms and methods of work. Analyzing the content of education and upbringing is important for self-regulation of one's own pedagogical activity, reducing uncertainty and randomness in teacher's professional actions. According to the systematic approach, the preparation of future geography teachers for continuous professional development is considered as a holistic system, where all components are interconnected and interdependent. The use of a systematic approach in conducting pedagogical research contributes significantly to its effectiveness. The systematic approach serves as a methodological basis for pedagogical research at all stages. The concept and model of preparing future geography teachers for continuous professional development are based on this methodology, which allows identifying general systematic properties and qualitative characteristics of individual components.

Among various approaches to pedagogical research, modern researchers are particularly interested in the *personal approach*. This interest is justified since the personal approach is based on the principles of humanistic theory, which plays a significant role in contemporary education. The main ideas of this theory have been developed by philosophers, psychologists, and educators throughout different historical periods. In humanistic theory, the individual is considered the highest value of society and has the right to various aspects of a dignified life, including education, upbringing, security, work, personal development, and self-realization in various spheres of life (Stepanchenko, 2017; Valko, 2020). The personal approach in the system of preparing future geography teachers for continuous professional development involves directing the educational process according to the curricula of the specialty 014.07 Secondary Education (Geography) towards the personality and individuality of the higher education applicant, taking into account their educational, organizational, informational, advisory, social, and research interests and needs during the learning process, considering their potential abilities and opportunities. The personal approach is focused not only on implementing individual forms, methods, and means of learning but also on developing civic, social, cultural, leadership, entrepreneurial, health-preserving, and other competencies through continuous self-development and self-education (Grunis, 2021).

The personal approach in preparing future geography teachers for continuous professional development is important not only during classroom and practical sessions but also during the educational, educational-field, and production (pedagogical) practices of higher education applicants, especially in the process of familiarizing them with the current state of the educational process in secondary educational institutions and advanced experience in schools (Krylovets, 2009; Mulaudzi *et al.*, 2023). The personal approach envisages that the individual acts as the subject of various aspects of educational activity, including cognition, communication, self-knowledge, and self-development. Among other positions reflecting the implementation of the personal approach in education, the following can be highlighted: cooperation as the key principle of interaction among all participants in the educational process; the active role of the student in the

learning process, where they become the subject-subject of interaction; orientation towards the subjective experience of the student as the basis for pedagogical decisions; stimulating students to achieve success and develop their own abilities; providing freedom of choice and action for students, which promotes their self-expression; taking into account student motivation in the learning process; supporting the idea of self-analysis of personality and understanding the personal meaning of knowledge. Thus, the personal approach in professional education focuses on self-awareness and self-development of the subject of the educational process, ensuring the disclosure of their own capabilities and achieving personal self-realization and self-assertion.

The personal approach in teacher training focuses on the individual as the main goal, subject, result, and main criterion of effectiveness and efficiency of this training. This approach serves as the basis for experimental verification of the model and for determining research prospects. In particular, the personal approach in teacher training involves individualizing education aimed at considering the personal characteristics of each student. It is intended to develop not only the professional skills and knowledge of future educators but also to shape them as individuals. This approach emphasizes the development of creativity, self-awareness, and the ability of geography teachers to independently solve pedagogical tasks and adapt them to various situations in the learning environment. To achieve success in the personal approach to the preparation of geography teachers, it is necessary to consider various theoretical and practical aspects of personality development, influential factors on the formation of individual traits and values of teachers. Additionally, the personal approach involves active participation of students in their own learning, planning, and assessment of results, stimulating their self-reflection and personal development. Overall, the personal approach is an important paradigm in modern pedagogical science and practice, aimed at creating conditions for unlocking the potential of each individual and forming highly qualified and responsible educators.

In modern pedagogical research, the *activity-based approach* is considered a methodology that promotes personality development through active subject activity, active forms of cognitive activity and creative reinterpretation of the world, as well as through active interaction with others. This approach allows assigning "personal impact" to professional tasks in human activity. Research results show that the active approach in professional education is implemented through creating conditions that help students freely choose their activities and achieve positive results in collaboration with teachers. It emphasizes the ideas of activity transformation, awareness of socio-cultural values, effective self-management, and creative self-realization, productive continuous self-education, development of personal and professional qualities, interests, and needs. The activity-based approach primarily focuses on organizing the process of professional training, emphasizing the active involvement of students, which includes setting and solving specific professional tasks, as well as real practical activities in pedagogical situations. The activity-based approach allows considering the individual needs of higher education students, opportunities, and results of studying new professional functions, participating in various educational processes, and having the opportunity to freely choose the path to achieving a relevant professional position. The activity-based approach in professional training is based on the active role of the student, their ability to independently solve tasks and engage in practical activities. These conditions allow students to develop their own professional skills and potential, understand their needs, and achieve certain professional goals.

The activity-based approach is based on understanding the interrelation and mutual influence between the teaching and learning subsystems, which operate as a single integrity. Professional and individual characteristics of the teacher affect the organization of students' learning and cognitive activities and the results of pedagogical work, considering regulatory requirements and providing it with a unique character. Carrying out pedagogical activities contributes to the development of personal qualities and characteristics of both the teacher and the student, influencing the formation of their beliefs, interests, values, and professional positions. Ensuring the effectiveness of natural science education in geography involves implementing an activity-based approach, which can be characterized by the motto "Four stages to achieve the goal: plan your activity, prepare to achieve goals, act enthusiastically, and constantly improve". In this way, future geography teachers position themselves as subjects of cognition of the geographical environment, communication, relations, and their own creativity, development. Activity contributes to the formation of all mental processes and consciousness in a person. These mental processes and consciousness, in turn, regulate activity and become key factors in its further development. Involving the subject in activity leads to the integration of various and complex components of activity into a single functional psychological system. Under the influence of activity requirements, individual qualities that make it up develop, acquiring properties of promptness and adaptability to these requirements.

The *axiological approach* in professional education is built on universal, civic, national, and professional values that determine a person's perception of the world, their own activities, and self-assessment. Key concepts within this approach include "value" (a set of real objects and abstract ideas that have great significance for society or an individual), "value orientation" and "value consciousness". The axiological approach serves as a special tool that contributes to the scientific analysis of various phenomena and events from the perspective of their potential to satisfy the current needs of people. On the other hand, it helps address tasks related to further humanizing society, particularly the education system. The application of the axiological approach in the professional training of future

geography teachers is justified by several factors. In the process of professional training, it is important to develop a system of value orientations for future geography teachers, which will serve as the foundation for the behavior, attitude, and worldview of students. These orientations are key components of a person's worldview and contribute to effective adaptation to the modern environment. The axiological approach allows considering professional training as a socio-pedagogical process in which humanistic values play a crucial role. These values are universal and fundamental. This approach promotes harmony between the goals and means of education, and it enables the analysis of subjects and phenomena in terms of their significance for students' development and the formation of their professional self-awareness. Additionally, the axiological approach involves the development of critical thinking, independence, and responsibility, which are important aspects of professional education.

This approach recognizes the individual as the most important value of society and defines them as the goal and object of development. In different historical epochs, certain values, such as life, health, love, education, science, work, peace, beauty, and homeland, have been the main focus of social interest. These values not only reflect the cultural and social priorities of the time but also form the basis for society's development, defining its directions and goals. They also play a crucial role in shaping the identity and worldview of individuals. They determine the moral, aesthetic, economic, ecological, and other aspects of personality, and their development is a key task of humanistic pedagogy. It is aimed at studying phenomena from the perspective of their value in satisfying human needs and the harmonious development of society. This approach recognizes the individual as the highest value of society and an important object of upbringing and education. It explores which values are most important for individuals and society as a whole and how they can be developed and implemented in pedagogical practice. The principles of the axiological approach are based on the belief that a person's life should be filled with values such as morality, culture, tolerance, social justice, and others. By considering the individual as the subject of value relations, this approach contributes to the development of their internal motivation, moral qualities, and readiness for active civic participation. The axiological approach also addresses the question of how to shape value consciousness and culture among students, contributing to their personal growth and socio-cultural development. This requires teachers to influence students' value orientations and promote their development as active and responsible citizens.

Equally important in the system of preparing future geography teachers for continuous professional development is the *synergistic approach*. The study of the synergistic approach in the training of future teachers has been the subject of works by Ukrainian and foreign scholars (Stepanchenko, 2017; Sahach, 2021). These systems are constantly evolving due to their ability to self-organize. Synergetics defines new paradigms in modern pedagogy, directing them toward stimulating the development of creativity and innovative thinking in future geography teachers, particularly in the context of continuous professional development. The synergistic approach is based on principles such as subjectivity, reflexivity, openness, and social partnership. It takes into account the non-linearity of educational systems and their internal tendencies for development, directing them toward achieving set goals (Zhyhir, 2016). The synergistic approach aims to ensure self-organization in the process of professional training for future geography teachers and the transition from a closed educational system to an open system. It defines the individual development of a specialist not only as a consistent, simple, harmonious process but also as a process accompanied by contrasts and leading to the transformation of value orientations and active self-identification and self-education activities. The synergistic approach represents a complex of interconnected principles for the functioning of various systems that can self-organize. In contemporary research, the synergistic approach is considered a general scientific methodology in the field of pedagogy. According to the synergetic concept, most systems in nature, which are open, constantly exchange energy and information.

The main principles of the synergetic approach are considered methodological foundations that can be used to identify the essence of the teacher training process using modern technologies. They can also be used to describe and evaluate this process using statistical methods in pedagogical research. The synergy of pedagogical influence arising from the combined impact of all components leads to the overall effect exceeding the influence of individual factors. From this perspective, the synergetic approach contributes to optimizing the preparation process of future geography teachers for continuous professional development. Additionally, this approach fosters the development of innovative approaches to teaching and teacher training that meet the demands of modern educational processes. It is important to note that the synergetic approach in pedagogy takes into account the dynamics and interaction of all components of the educational process. It allows considering teaching and education as interconnected and interdependent aspects of educational activity. Pedagogical processes become more effective when viewed as a system in which each element interacts with others. The application of the synergetic approach in pedagogy opens up opportunities for creating innovative educational programs that take into account the impact of various factors on the learning and teaching process. This enables the development of more effective and adaptable pedagogical approaches and methods tailored to the needs of contemporary education. Considering the growing complexity of modern society and educational requirements, the synergetic approach can become a crucial component for the further development of pedagogy and teacher training. It promotes a deeper understanding of the processes of learning and teaching, allowing for their optimization

and increased effectiveness. Creativity and flexible thinking are essential for adapting to constant changes characteristic of contemporary social development.

The *competency-based approach* is recognized as an educational methodology based on defining competencies (educational outcomes) as the main focus. It serves as an important resource for rethinking traditional goals, theories, and practices of education. The concept of "competence" is recognized as a new key element of education, indicating a shift in focus in professional education from subject-oriented knowledge to a more personalized approach. Effective development of competencies is achieved through increasing practical training while maintaining fundamental aspects of learning. In the field of theory and methodology of professional education, the competency-based approach is recognized as the basis for defining the learning objectives of a specialist (Timets, 2011). Competence, in turn, becomes a new key category that serves as a common language for expressing the results, planning, and content of education. One argument in favor of implementing the competency-based approach is the need to align educational systems in a globalized world to provide young people with opportunities to integrate into various social environments and independently determine their place in life. In such a context, not only the formation of educational outcomes and procedures become important, but also the content and process of learning, which must be mutually aligned. The competency-based approach entails shifting the focus from accumulating normatively established knowledge, skills, and abilities to developing practical activities in the individual, the ability to apply individual techniques and experience successful actions in professional and social situations.

The competency-based approach is becoming increasingly widespread. The main educational goals are key competencies that modern geography teachers' training should focus on. The competency-based approach attracts significant attention in the international scientific and pedagogical community. In the international educational context, practical forms already exist and are successfully implemented, allowing for the realization of the main principles of the competency-based approach in professional education. The process of training future geography teachers with a competency-based approach includes the development of personal and professional competencies. Personal competencies include the ability to overcome problems and stress, demonstrate tolerance, work in a team, be communicative, initiative, non-standard, use new ideas and innovations, as well as argue one's opinion. Professional competencies specific to geography teachers include knowledge of geographical processes, the ability to analyze geographical data, understanding the interrelationships between different geographical factors, and the ability to teach this knowledge to students. Pedagogical skills are also an important component, such as lesson planning, using various teaching and assessment methods, as well as establishing positive relationships with students.

The main results of the study focus on methodological approaches to preparing future geography teachers for continuous professional development. These results are related to contemporary trends in education and the need for innovation in the educational process, including the findings of the research by B. Pasang & S. Najib (2022) regarding the continuous professional development of students and their awareness of the positive qualities of education for sustainable development; Š. Karolčík & M. Marková (2023), whose work considers the importance of dynamic changes and innovations that geography teachers encounter; C. Martínez-Hernández *et al*. (2023), whose research on online education and blended learning, including geographic information system tools, highlights the role of an activity-based approach; the synergistic and systematic approach is elucidated in the work of F. Guo *et al*. (2022) regarding readiness to develop problem-solving abilities in real-life situations among geography students; V. Pasternatskyi *et al*. (2023), whose work generally defines the pedagogical context of self-education for teachers.

Thus, the system of preparing future geography teachers for continuous professional development should be based on a comprehensive approach that includes various methodological approaches. This approach should ensure the formation of necessary competencies and skills in future teachers for successful and continuous development throughout their professional careers. Analysis of research indicates the importance of developing effective teaching methods and approaches that would instill in students the readiness for self-improvement throughout their professional activities.

CONCLUSIONS

Studying and analyzing methodological approaches to the education of future geography teachers and identifying their characteristics in the context of continuous professional development are essential for improving the teacher education system in Ukrainian higher education institutions. Various methodological approaches to this issue have highlighted key aspects, such as the development and implementation of modern geography teaching methods reflecting current trends in education. Special emphasis is placed on identifying effective teaching strategies and the readiness of future geography teachers for continuous professional development in practical application. Additionally, there is a need to reconsider approaches to teaching and implementing innovations in geographic education, which will require future geography teachers to continually enhance their professional competencies through ongoing learning.

The main results of the study include recognizing the importance of professional preparation of future geography teachers for continuous professional development and adapting teaching approaches to modern educational challenges. Methodological approaches and their implementation in the context of continuous professional development were analyzed using various research methods. Key methodologies and tasks related to preparing future

geography teachers for continuous professional development were identified, along with the specific features of different methodological approaches to this process. The importance of individualization in the preparation of future geography teachers, which contributes to their continuous professional development, was also highlighted. The characteristics of primary approaches (systematic, personal, synergistic, activity-based, axiological, and competency-based) were thoroughly described in the context of preparing future geography teachers for continuous professional development. The importance of fostering the readiness of future geography teachers for continuous professional development was emphasized in the context of professional preparation considering each methodological approach. Prospects for further research may involve analyzing specific teaching methods and learning strategies, their impact on acquiring professional skills, and enhancing the motivation of future geography teachers for learning.

ACKNOWLEDGEMENTS

None.

CONFLICT OF INTEREST

None.

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Методологічні підходи підготовки майбутніх учителів географії до безперервного професійного розвитку

Анотація. У світі, де відбуваються швидкі зміни в суспільстві, економіці та технологіях, необхідно, щоб майбутні вчителі географії були орієнтовані на останні тенденції та готові адаптуватися до них шляхом постійного фахового розвитку. Відповідно, метою наукової статті стало визначення сутності та характеристика основних методологічних підходів підготовки майбутніх учителів географії в контексті їх безперервного професійного розвитку. В роботі використано різноманітні методи дослідження, включаючи теоретичний аналіз психолого-педагогічних джерел, опис, синтез, систематизацію, абстрагування, порівняння та узагальнення даних. Ці методи допомагають ідентифікувати основні аспекти методологічних підходів до підготовки майбутніх вчителів географії до постійного професійного розвитку. Вони також використовуються для створення моделі навчання, яка сприяє безперервному розвитку учасників освітнього процесу. У дослідженні розкрито методологічні підходи до підготовки майбутніх учителів географії до неперервного професійного розвитку. Визначено концептуальну методологію та завдання дослідження, особливості методологічних підходів до підготовки майбутніх учителів географії в умовах неперервного професійного розвитку. У статті розкрито сутність індивідуалізації у підготовці майбутніх учителів географії до безперервного професійного розвитку. Охарактеризовано особливості основних підходів (системного, особистісного, синергетичного, діяльнісного, аксіологічного і компетентнісного підхідів) у підготовці майбутніх учителів географії до безперервного професійного розвитку. Підкреслено значимість формування готовності майбутніх учителів географії до безперервного професійного розвитку у професійній підготовці відповідно кожного методологічного підходу. Акцентовано увагу на важливості переходу від класичних моделей освітньої підготовки майбутніх учителів географії до систем, які готують професіоналів, спроможних працювати в нових обставинах і готових до постійного навчання, виховання та безперервного професійного зростання. Практична цінність дослідження полягає в тому, що воно акцентує увагу на важливих методологічних підходах та інноваційних методиках, які можуть бути використані для адаптації підходів до організації освітнього процесу за спеціальністю 014.07 Середня освіта (Географія) та за іншими спеціальностями підготовки майбутніх учителів в умовах сучасних викликів в освіті

Ключові слова: теорія і методика професійної освіти; педагогічна система; самоосвіта; самовдосконалення; методологічний підхід; системний підхід; освітньо-професійна програма

Vol. 2. No. 2. 2023 Scientia et societus
Received: 16.08.2023.
Revised: 20.11.2023.
Accepted: 12.12.2023.
Journal homepage: https://ses.journal.in.ua/index.php/ses/issue/view/4

UDC 373.2](44)(091)(092) *DOI: 10.69587/ss/2.2023.119*

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On historical origins of preschool education: Pedagogical activity and concept of Marie Pape-Carpantier (1815-1878)

Abstract. The system of preschool education, which is currently undergoing the process of transformation, needs to have its contents updated and innovative technologies implemented into the organization of educational process in preschool education institutions. To implement the abovesaid, it is valuable to make an attempt at retrospective consideration of the origins of the preschool education system, which outlines the relevance of the suggested research. The purpose of this scientific inquiry lied in performing a historical and pedagogical analysis of the activities and concept suggested by the founder of French preschool education, Marie Pape-Carpantier, and in identifying its progressive views in accordance with modern considerations. To achieve the stated goal, a combination of the following methods was used: theoretical analysis, synthesis and concretization, historical and pedagogical (retrospective and chronological-structural), pedagogical historiography, systematization and generalization. The article reveals peculiarities in development of public preschool education in France in the middle of the 19th century, based on the study of pedagogical heritage by Marie Pape-Carpantier (1815-1878). The author highlights historical significance of the French pedagogue Marie Pape-Carpantier in the context of biographical data regarding both her immediate work with preschoolers in shelter rooms and training of qualified personnel for such institutions. The research puts emphasis on the means of education applied by the French pedagogue in shelter rooms to engage in physical, mental, moral, labor and aesthetic education of children. The article singles out main progressive ideas regarding organization of educational process with children of preschool age: consideration of every child's individual development and current level of their knowledge, compliance with principles of cooperation, moral behaviour, visual aids, activity-based approach (in particular, use of games), and requirements to teachers. The scientific and practical value of this research is envisaged in supplementing the teaching material of the

Suggested Citation:
Lokhvytska, L., Semenov, O., & Semenova, N. (2023). On historical origins of preschool education: Pedagogical activity and concept of Marie Pape-Carpantier (1815-1878). *Scientia et societus*, 2(2), 119-131. doi: 10.69587/ss/2.2023.119.

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educational component “History of Preschool Pedagogics” with information on the founder of French public preschool education Marie Pape-Carpantier

Keywords: history of preschool pedagogics; France; shelter rooms for children; training personnel to work with preschoolers; conceptual provisions for organization of educational process with preschool children; didactic materials

INTRODUCTION

The typical feature in development of preschool education in Ukraine is the search for, and implementation of innovative conceptual provisions meant to ensure effectiveness of the educational process involving children of preschool age. Such processes of transformation and modernization are both intended to improve the contents used in preschool education institutions and to enhance overall performance of the preschool education system. Accordingly, this situation outlines the need to consider historical origins of the world’s best examples of preschool education, which leads to retrospective analysis that determines relevance of the present research. It is the close consideration of European advanced pedagogical experience in the field of preschool education, and primarily of its formation and evolution, that helps us to determine the most important aspect in the comprehensive process of updating the whole preschool education system at the modern stage of its reformation.

In connection with the abovesaid, one of the top-priority lines of activity has been defined to be harmonization of the Ukrainian and European education spaces, as indicated in the program EDUCATION 4.0: Ukrainian sunrise (2022). In the works of Ukrainian historical and pedagogical school of thought regarding the study of European preschool pedagogics (Rambu *et al.*, 2019; Kanarova & Nikirenkova, 2022), authors point out the determining factors that influence emergence of public preschool education, the peculiarities of its provision and the typology of institutions caring for children of preschool age. They emphasize the progressive milestone of founding the latter institutions in France. In particular, the research conducted by N. Melnyk (2017) mentions that they “date back to 1771 when first “knitting schools” (*écoles à tricoter*) appeared, <...> followed in 1825 by new institutions known as “shelters” (*salles d’asile*) and meant for education and upbringing of children from poor families... Beginning from 1828, preschool education in France becomes the focus of government attention, and in this connection, an official program of state regulation was introduced in 1830 <...> under which care services for children aged from 2 to 6 were provided”. Described by such researchers as N. Fedchyshyn & O. Permyakova (2019) and N. Rambu *et al.* (2019), the movement for preschool education in the 19th-century France provides with sufficient grounds to state that it was the time for emergence of pedagogical ideas that determined further evolution of both theory and practice of educating and upbringing children in public institutions specifically designed for this purpose.

French preschool institutions called maternal schools (*ecoles maternelles*), as stated by Ukrainian scientists L. Kozak (2017), I. Ulyukaeva (2018), V. Ivanova (2019), evoke particular interest since they are believed to be the pride of French education system and have no equivalent worldwide. Despite the information available in the abovesaid research works, the description of foundation, characteristics of age categories of children attending them, the statistics dating back to the corresponding historical period, the concise description of their work with the said categories of children, the authors lack information on specific figures involved in such activities and on their opinions regarding peculiarities of the educational process for preschoolers. In research works, historical origins of French preschool education are mostly considered in close connection with the name of Pauline Kergomard, who is believed to be the founder of nursery schools and public preschool education. She advocated the idea of facilitating a child’s natural development and showing respect to children, substantiated the use of games as a free form of children’s activity, insisted on avoiding excessive academicism, and called for coordination between the curricula of maternal schools and primary schools (Georgieva-Hristozova & Slavov, 2018; Mutuale & Weigand, 2019). At the same time, it is worth mentioning that scientists have noticed quite an interesting historical fact: Pauline Kergomard “found inspiration, learned, and followed the example” of Marie Pape-Carpantier – the French “reformer of education” and “an activist towards the problems of social injustice” who “made her contribution to development of pedagogy” (Georgieva-Hristozova & Slavov, 2018). It is thanks to these “two kind-hearted women who stood at the beginnings of kindergartens: Marie Pape-Carpantier (1815-1878) and Pauline Kergomard (1838-1925)”, A. Mutuale & G. Weigand, (2019) believe, that the French system of preschool education was formed. Hence, the issue of Marie Pape-Carpantier as the first person who advocated creation of public institution for preschool children and developed a corresponding practice for their activities outlines a field of significant scientific interest.

In particular, the work by a French pedagogue F. Klein (1916), describing the experience of operating nursery schools, was translated. The preface for the translated edition was prepared by Sofia Rusova, the founder of public preschool education in Ukraine, who covered the history of extension of nursery schools and other preschool education institutions in France. Therefore, resorting to the experience in operation of French institutions of public preschool education as examples of best practice has taken place in Ukraine at the stage when its national system of preschool education was being formed. With consideration of the well-grounded relevance and significance that consists in the search for truth in identifying historical origins of preschool education, particularly in France as the country

characterized by ancient roots and peculiar evolution of the preschool education system that served as a reference point for other nations, we find the point of this research in studying the activities and presenting the pedagogical heritage of one of the early founders of early schooling Marie Pape-Carpantier, since it is thanks to the efforts of specific figures that systems of preschool education have advanced and developed.

The purpose of the article was to conduct a historical-pedagogical analysis of creative activities and the system of views held by the founder of French preschool education Marie Pape-Carpantier (1815-1878), and to substantiate the progressive ideas she formulated in regard to development, upbringing and teaching of preschool children.

Our tasks consisted in the following:

1) Studying the main stages in pedagogical activity of Marie Pape-Carpantier and revealing peculiarities in development of public preschool education in France in the middle of the 19th century;

2) Outlining provisions of the concept developed by the founder of the French preschool education Marie Pape-Carpantier, which are expressed in her pedagogical works;

3) Identifying progressive ideas of the French pedagogue in accordance with standards of the present-day preschool education and offering their implementation into the contents of the educational component "History of preschool pedagogics" for education applicants seeking their first (Bachelor's) degree in specialty 012 "Preschool Education".

Scientific novelty is seen in primary presentation of results of the inquiry which the authors have undertaken to supplement the scope of historical and pedagogical knowledge about formation and development of preschool education in France, particularly the developments implemented owing to the contribution of Marie Pape-Carpantier as one of the founders of public preschool education, who reformed shelter rooms that were predecessors of kindergartens and developed a system to organize work with children of preschool age.

MATERIALS AND METHODS

Research work was performed in accordance with the following main stages. At the *first stage* was defined the topic of research regarding the problem under consideration, identification of chronological limits related to life and pedagogical activities of Marie Pape-Carpantier; examination of theoretical basis and clarification of materials available in the historical-pedagogical database which are dedicated to this figure in the context of evolution of preschool education; outlining lack of information on the person who was behind the development of public early schooling in France, which predetermined the need for research and defined the purpose in conducting scientific search in order to overcome the information vacuum and supplement the contents of the educational component "History of preschool pedagogics"; At the *second stage*, was conducted a theoretical analysis of historical-pedagogical sources and secondary source study bases (a critical review of pedagogical activities and pedagogical heritage of Marie Pape-Carpantier in publications by foreign scientists), substantiating collected materials and presenting a description of main milestones in creative activity and pedagogical developments (conceptual provisions) of the outstanding French female pedagogue; At the *third stage*, the conclusions based on the results of the historical and pedagogical research are formulated, which enabled to state the essential significance of scientific consideration of Marie Pape-Carpantier's pedagogical activities and call for implementation of her progressive ideas into theory and practice of preschool education.

Substantiation for choice of the methods used: *methods of theoretical analysis, synthesis and concretization* used for examine the source base and source study aspects of the problem under consideration, which consists in clarifying historical origins of preschool education in terms of public early schooling and corresponding institutions for children of preschool age; *historical-pedagogical methods* (retrospective and chronological-structural) used to consider the traditional approaches to upbringing children that were formed by that time, and to arrange biographical data on Marie Pape-Carpantier which can be found in modern information sources and databases; *method of pedagogical historiography* used to interpret the results of studying historical sources (pedagogical works by Marie Pape-Carpantier), identify the main tendencies in pedagogical activities of Marie Pape-Carpantier that correspond with the historical period where she lived, and to single out key provisions of her concept regarding formation of preschool education; *method of systematization* used to outline leading ideas in the pedagogical heritage of Marie Pape-Carpantier from the viewpoint of the contemporary France (mid-19th century – late 19th century) and from the viewpoint of modern theory and practice of preschool education; *method of generalization* used to identify and compose conclusions regarding the pedagogical activity and concepts of the French pedagogue Marie Pape-Carpantier in the context of contemporary pedagogical activities of the era where she lived, and to formulate prospects of further research work in the field of history of preschool pedagogics.

RESULTS AND DISCUSSION

Biographical description of Marie Pape-Carpantier's life and periods of her professional activity

For scientific consideration of historical significance of the French female pedagogue Marie Pape-Carpantier in formation of public preschool education and development of theory and practice of early schooling, it is essential to characterize the main milestones of her pedagogical activity in terms of biographical data. Based on the information found in online sources, it can be stated that Marie Joséphine Olinde Carpantier (her maiden name) was born on 10 September, 1815 in La Flèche, in a modest family of a Bonaparte soldier André Carpantier and a seamstress Joséphine Rose. Her father died early and Marie's mother had to raise two children on her own, so the girl grew in poverty, even having

to live with her grandmother for some time (before starting school). At the age of four, Marie was finally sent to school, although she only attended it until the age of 11, leaving her studies to help her mother with sewing (Brouard, n.d.).

In 1835, Marie who was had already been known in her hometown for her literary activities (she composed and recited poems) was entrusted with managing the newly opened shelter of La Flèche, which operated under the current project of Jean-Denis Cochin "Manual for shelter rooms management" approved by the Guizot law on (Loi Guizot) on 28 June 1833, which regarded primary education for children. Under this project, shelter rooms were to be opened for children from poor families aged from two to six years old. On the one hand, it envisaged to relieve women from caring for their children and involve female workers into industry, while on the other hand it provided elementary education for such children. In fact, shelter rooms became a prototype of kindergartens. Many times, Marie went to a similar institution in Le Mans managed by Claude Pape to learn from experience. This was where she met his son Léon Pape, a Paris Guard lieutenant, and the two developed mutual interest that soon grew into love.

In 1839, Marie Carpantier fell seriously ill and did not work with children for some time. After recovery, she continued her pedagogical career with renewed enthusiasm and began to express her views on upbringing and educating children, criticizing the "Manual for shelter rooms management" in her publications. From 4 July, 1842 Marie took over as the chief of the shelter room in Le Mans previously managed by Claude Pape. In 1845 she suggests reorganizing similar institutions into nursery schools, providing appropriate substantiations in her articles. In 1846, her publication "Advice on running shelter rooms" came out and was noticed by the then minister of education, academician Narcisse-Achille de Salvandy.

In 1847, Marie presented her project of a nursery school to the new minister of education Lazare Hippolyte Carnot, and a high committee began to reform shelter rooms. In the same year, she was appointed the director of the "House of Teaching" (better known as Cours Pratique or Cours Carpantier), the first educational institution in Paris that was intended to train future pedagogues and nursery school directors. She held this position for 27 years. However, the revolution of 1848 suspended the reorganization of shelter rooms and the term "nursery school" was not in use until 1881 when the current minister of education Jules Ferry and the ministry's chief of staff Ferdinand Buisson, influenced by Pauline Kergomard, re-introduced it. This is why 1881 is officially recognized as the date of founding nursery schools in France. However, it is worth remembering where their origins came from.

Returning to the biographical description of Marie Pape-Carpantier's life, it should be appropriate to point out a few important dates. In 1849, Marie Carpantier married Leon Pape. On 13 April 1855, their daughter Madeleine Pape-Carpantier was born in Paris; later she became a teacher in the French capital, and in 1875 she headed one of the courses launched by her mother. In 1862, works by Marie Pape-Carpantier on organization of the educational process with children in shelter rooms received awards at the third London International Exhibition. She was the first woman to give a speech in Sorbonne in 1867. Marie Pape-Carpantier's reputation reached its peak when she held five conferences from 21 August to 19 September of the same year during another International Exhibition. As an innovative teacher and an expert educator, she was tasked with presentation of methods applied in shelter rooms and holding five conferences (from 21 August to 19 September) on the initiative of the minister of education of the Second French Empire Victor Duruy, who wanted to renovate the education system and approved her practical course. Lectures by Marie Pape-Carpantier facilitated the spread of education reforms in that period (Brouard, n.d.). Marie Pape-Carpantier outlined her main ideas on upbringing and educating children in shelter rooms in a series of pedagogic works. Their list is given in the Table 1 below.

Table 1. The list of pedagogical works by Marie Pape-Carpantier

Name	First published	Originally published as
Advice on running shelter rooms	1846	*Conseils sur la direction des salles d'asile*
Method of teaching and education and exercise	1847	*Méthode d'enseignement et d'éducation et exercice*
Practical Teaching in Nursery Schools	1849	*L'Enseignement pratique dans les écoles maternelles*
Stories and object lessons for children	1858	*Histoires et leçons de choses pour les enfants*
The French economist	1859	*L'Économiste français*
Natural geometry	1861	*Géométrie naturelle*
Varied little readings for children of both sexes	1863	*Les Petites Lectures variées pour les enfants des deux sexes*
Teacher's manual	1969a	*Manuel de l'institutrice*
The wild animals Domestic animals	1869b 1872a	*Les Animaux sauvages* *Les Animaux domestiques*
Zoology for schools, shelter rooms and families	1872b	*Zoologie des écoles, des salles d'asile et des familles*

Source: developed by the authors

She was also the author of some publications that appeared in a journal (economic weekly) "L'Économiste français", founded in 1862 by a well-known French lawyer, economist, geographer and journalist Armand Jules Duval. Marie Pape-Carpantier finished her pedagogical activity in 1874, at the age of 59, after being dismissed from her

official position for freethinking and upholding views that contradicted current and generally recognized opinions on education (during the presidency of Mac-Mahon and Cumont's term as the minister). However, she was rehabilitated after a few months and then appointed the general inspector of shelter rooms, holding this position until she died. With her activities, Marie Pape-Carpantier (Fig. 1) managed to raise the status of shelter rooms to the level of a true educational institution. Marie Pape-Carpantier passed away in Villiers-le-Bel on 31 July 1878. She was buried in Montparnasse Cemetery (Paris).

Figure 1. The portrait of Marie Pape-Carpantier
Source: FranceArchives (n.d)

Throughout her life, Marie Pape-Carpantier engaged in pedagogics (both practical activities and development of theoretical foundations), worked to fix poverty, social injustice, and fought for women's rights. She played a special role in creating the concept of preschool education, to which she gave over forty years of her earthly existence, and it actually shows her devotion as the founder and promoter of public early schooling in France, which also influenced the rest of Europe. Marie Pape-Carpantier's memory is honored by many nursery schools named after her, and one of the streets in Paris was renamed in recognition of her merits. Main periods of her professional activities are presented in Figure 2. The milestones of Marie Pape-Carpantier's pedagogical activities.

Practical work with children

- 1835 – head of the shelter in La Flèche
- 1842 – director of the shelter room in Le Mans

Teaching activities aimed at training pedagogical staff

- 1847 – director of the first educational institution in Paris for the recruitment and training of pedagogical staff to work with children in shelters
- 1867 – lectures at conferences at the Sorbonne
- 1874 – general inspector of shelters

Figure 2. The milestones of Marie Pape-Carpantier's pedagogical activities
Source: developed by the authors on the basis of their research materials

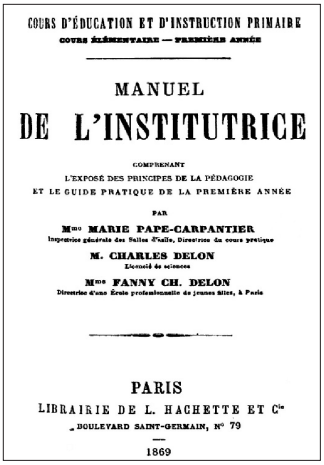
The researcher of her biography, a well-known French scientist and academician C. Cosnier (1993; 2003) pointed out that despite her initially reluctant agreement to manage a shelter room in 1835, since such institutions were notorious for ill-behaved occupants, weak discipline, failure to comply with hygiene rules, and lack of basic knowledge of the environment, Marie soon came to like the contact with children and working with them. Marie Pape-Carpantier devoted all her life to this activity and managed to create a true prototype of an educational institution for preschoolers that complies with requirements for organization of modern kindergartens. Taking into account the fact that education for underprivileged communities was almost non-existent in the 19th century, her activities were extraordinarily progressive. In spite of her modest background, Marie Pape-Carpantier was a most valued pedagogue, who was imbued with an idea not only to provide children with education and upbringing, but also to improve their lives in general. As a person of great inner power, she persisted in her work to create an institution where working-class children could feel comfortable and happy, in contrast to their living conditions: roaming the streets, suffering from malnourishment, being left at home alone all day while their parents tried to make at least a basic living. C. Cosnier (1993, 2003) emphasized Marie Pape-Carpantier's contribution to the development of preschool pedagogics: from institutions where children were only looked after to keep them away from streets, shelter rooms turned into nursery schools for education and development, where pedagogues worked to activate children's natural inquisitiveness, evoke their interest in the outside world and help them to cognize and discover it. The scientist remarks: "While all of this seems usual to us, what Marie developed in the 19th century was an extraordinarily progressive and innovative approach to organizing the educational process with preschoolers". The originality of Marie Pape-Carpantier's ideas is expressed in the series of articles she published and a number of books on pedagogics that comprise her pedagogical heritage, which can be viewed as being relevant for her era, since many of them would be translated into several languages and distinguished by the French Academy awards.

Her speeches in Sorbonne (where she was the first female speaker invited) and the conferences she had held there were highly successful with the teachers who were her target audience; later, with these lectures were published. This is why one should be obliged to Marie Pape-Carpantier as the ideological inspirer for true nursery schools to emerge through the concept of their operation that she had developed. Ideas similar to those expressed by the previous author can be also found in the study of Marie Pape-Carpantier's heritage conducted by the French scientist B. Klein (2007), he characterized Marie's pedagogical activity as innovative, substantiating it as follows: "Shelter rooms are an education-related form of what will become a nursery schools in the days of the Third Republic in France; publications on early schooling for children; elaborated

contents and methods for giving subject lessons that were presented at the Sorbonne conferences". It is followed by the overview of main provisions of Marie Pape-Carpantier's (Pape-Carpantier, 1849; 1861; 1869a) concept regarding organization of educational process with children of preschool age in conditions of public preschool education (shelter rooms – institutions that operated in France during the studied historical period).

The overview of main provisions of Marie Pape-Carpantier's concept

Primarily, the textbook "Teacher's manual" (Pape-Carpantier, 1869a) focused on the approaches and methods suggested for interaction with children of preschool age (Fig. 3). As for the former, Marie Pape-Carpantier singled out the application of natural correspondence approach and the principle of developmental learning in organizing educational process with preschoolers. In applying these, the female pedagogue found the "visual lesson" method to be the most effective. For its successful implementation, teachers (educators) of shelter rooms working with children both need to realize the peculiarities of this age period and to direct their own motivation for diversifying the environment when organizing the educational process. Systematic learning stimulates children's development and encourages them to widen the scope of knowledge, instils new skills and helps to cultivate new habits for activity in their immediate environment.


COURS D'ÉDUCATION ET D'INSTRUCTION PRIMAIRE

COURS ÉLÉMENTAIRE — PREMIÈRE ANNÉE

MANUEL

DE L'INSTITUTRICE

COMPRENANT

L'EXPOSÉ DES PRINCIPES DE LA PÉDAGOGIE

ET LE GUIDE PRATIQUE DE LA PREMIÈRE ANNÉE

PAR

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PARIS

LIBRAIRIE DE L. HACHETTE ET Cie

BOULEVARD SAINT-GERMAIN, N° 79

1869

Figure 3. The title page of Marie Pape-Carpantier's book
Source: M. Pape-Carpantier (1869a)

The key provisions suggested by Marie Pape-Carpantier as regards organization of work with children of preschool age in shelter rooms are presented in Table 2.

Table 2. Some provisions suggested by Marie Pape-Carpantier for organization of work with children of preschool age in shelter rooms

Pedagogical ideas of Marie Pape-Carpantier	Interpretation in the context of preschool education development in the 21st century	Source
Ever since a child is born, they start learning regardless of whether this process is guided or not.	Substantiation for the natural correspondence approach	Preface to *Teacher's manual* (Pape-Carpantier, 1869a)
For them (childrens) "living and learning are the same, <... > because to live is to see, hear, experience, and all of these is not done without comparing, reasoning and remembering, that is without learning".	Outlining the principle of developmental learning	*Teacher's manual* (Pape-Carpantier, 1869a)
It's not worth tempting fortune and letting children receive misleading impressions. One should think over and plan the work with the "young soul" so that they can be guided in the direction of what is "clever and true, < ... > taught to see clearly what is around them, to compare, contemplate, and finally recognize themselves in the environment where they live".	Representation of the "visual lesson" method	*Teacher's manual* (Pape-Carpantier, 1869a)
The teachers' duty is to "teach them various things" to stimulate imagination of the little pupils, maintain the development of their intellect and "satisfy the early abilities which are revealed".	The essence of interaction as mutual activity taking place between the pedagogue and the children	*Teacher's manual* (Pape-Carpantier, 1869a)
"We notice so little about the way in which knowledge is gained, that we almost never know how to convey it".	Pedagogues' need for professional development and search for innovative technologies in organization of the educational process with preschoolers	Concluding words of the preface to *Teacher's manual* (Pape-Carpantier, 1869a)

Source: developed by the authors

In the context of the abovesaid, one can distinguish the conceptual provision of the French preschool education founder concerned with the significance and mission of a pedagogue in guiding a child's cognitive development in the course of such learning that would satisfy the child's needs and natural inclinations. She emphasized that it comprises the primary intellectual need of preschool childhood and is the foundation of teaching children. Hence the statement suggesting establishment of a pedagogue's interaction with children with the purpose of achieving the planned educational goal. But in no way, as Marie Pape-Carpantier would remark, should the educational process involving children aged from 2 to 6 be similar to that implemented in schools. This confirms the progressive nature of Marie Pape-Carpantier's educational concept in terms of searching for innovative technologies to work with preschoolers, and in terms of understanding the need to improve permanently the skills of educators (pedagogues) who implement the educational process with children of preschool age.

Researchers of her pedagogical heritage B. Klein (2007; 2010) and J.-C. Régnier (2003) pointed out that the phenomenon of Marie Pape-Carpantier consists in the fact that she has characterized versatile upbringing and systematic practical teaching of children in shelter rooms, which encompassed first "lessons" in history, morals, grammar, geography, music, drawing, introduction to nature, elements of maths (calculation and counting), getting to know the environment (differentiating objects by colour, spatial location, weight etc). As a matter of fact, the pedagogical ideas formulated by Marie Pape-Carpantier laid the theoretical foundations for modern didactics and educational practices of preschool education establishments, in the historical perspective. Directly working with children, the female pedagogue realized the effectiveness of implementing the "visual lesson" as a method for interaction between the teacher and the children (Klein, 2010). Forming elementary mathematical ideas (primarily counting and calculating) envisaged ensuring children's cognitive development. Examining the abacus suggested by Marie Pape-Carpantier, researcher J.-C. Régnier (2003) arrived at the conclusion that to help children master the numerical row, flipping cards displaying numbers from 1 to 9 were attached to it, and the corresponding card was set up according to the number of beads positioned on every rod (Fig. 4).

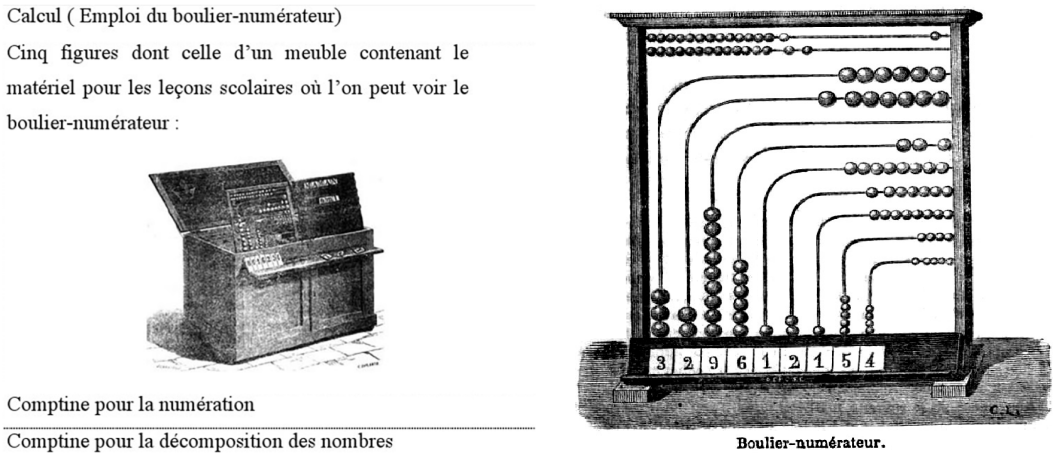

Figure 4. An abacus (from a book by Marie Pape-Carpantier)

Source: M. Pape-Carpantier (1869a)

The method of teaching children to count consisted in introducing them to numbers and plurals, and practicing in counting objects with the use of two horizontal rods of the abacus. After that, they were taught addition, accompanied by singing certain melodies (for example, when one was added, it was one melody, when two was added, another and so on, when they learned how to add in threes and fours). As to subtraction, they were first taught to subtract by 1, then by 2, and then by 3. Children also mastered the difference between even and uneven numbers by "dividing them in half: a half of an even number always forms a whole number, while a half of an uneven number always forms a fractional number... Such exercises are intelligible enough for little children to do, but their abilities should be taken into account" (Régnier, 2003). For better perception of learning materials Marie Pape-Carpantier recommended using visual aids (Fig. 5). It is important to teach a child to correlate the number and the image, i.e., the digit that expresses it. When children have mastered the knowledge of relationship between numbers and digits, they can go on to analysis or factorization of numbers over 10. Appropriate methodical techniques recommended by Marie Pape-Carpantier could include "switching children's attention, sudden and unexpected questions (for example, which numbers are required to represent the number they have just named), asking a child to sing (if the child is too shy to answer)" (Régnier, 2003). While doing it, one should not make any remarks about the relative positioning of figures in regard to each other. The main task is to fix the mathematical operations involving various numbers in children's memory.

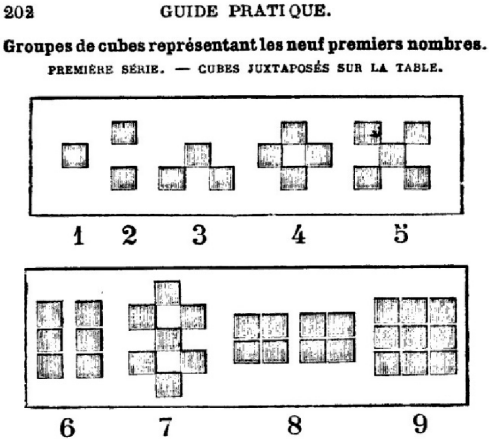

Figure 5. Education materials for teaching mathematics by the concept of Marie Pape-Carpantier
Source: M. Pape-Carpantier (1869a)

The overview of main provisions of Marie Pape-Carpantier's concept

The French pedagogue advised: if a child makes a mistake, the teacher should not reprimand the child directly, but rather express surprise at such answer, so that the child could reflect on the answer and correct the mistake independently (Pape-Carpantier, 1869a). Games can help to master the knowledge: assigning meanings to numbers by using them to solve certain problems, or to describe practical situations from personal experience (for example, counting vegetables collected from the field etc), expressing emotions through mimics, using visual aids etc (Fig. 6).

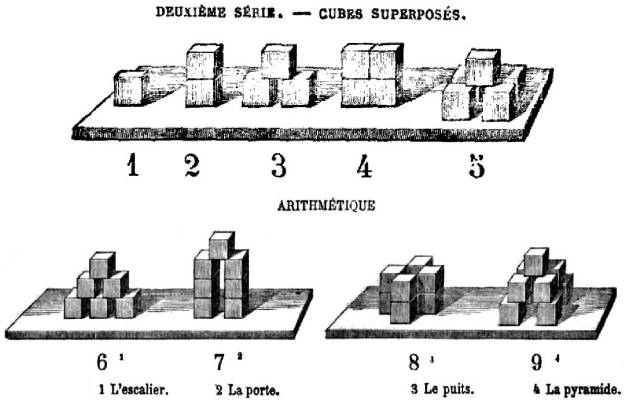

Figure 6. Cube-shaped blocks for teaching children to count by Marie Pape-Carpantier's concept
Source: M. Pape-Carpantier (1869b)

The use of visual aids has a prominent place in Marie Pape-Carpantier's concept, since in her opinion it ensures a child's cognitive development, arouses their inquisitiveness and the desire to discover the surrounding world. The abovesaid is particularly powerfully expressed in the female pedagogue's views on teaching mathematics to children, especially the aspects related to "introducing them to quantities (operations in increasing, decreasing, uniting, dividing and replacing)" (Régnier, 2003). According to Marie Pape-Carpantier, "Children are the mirror of correct image, reflecting the smallest feelings of the person that interacts with them. So keep your composure and interest. <...> Make learning pleasant and try to convey the sweetness of its fruits" (Pape-Carpantier, 1869b). It is the pedagogue that children's success in learning depends on, the learning material should be presented in an interesting and exciting way, and with sufficient amount of visual aids (Fig. 7).

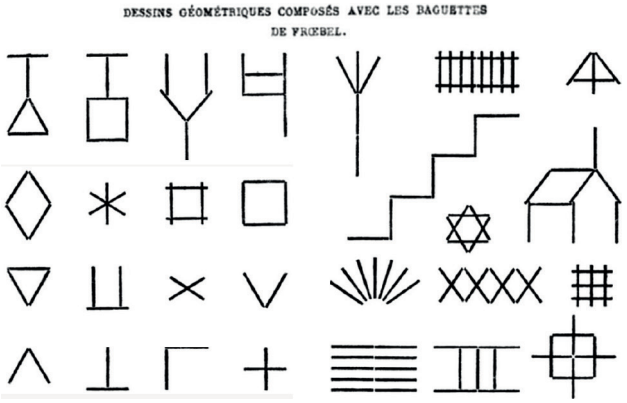

Figure 7. Counting sticks for teaching mathematics ("geometry") by Marie Pape-Carpantier's concept
Source: M. Pape-Carpantier (1869a)

Despite the fact that pedagogical works by Marie Pape-Carpantier lack a detailed description of applying the principle of visual aids, in her publications she often emphasized it and provided specific examples of using didactic materials in the work with children, which helped them to form ideas of color, shape, size etc and gain practical skills in using them in their own activities (Pape-Carpantier, 1849; 1869). The French pedagogue provided effective advice on teaching pupils to read and write, which was implemented during "visual lessons" – classes of a special kind (Pape-Carpantier, 1861). It is this method of interaction between adults and children, in the words of her compatriot B. Klein (2010), that "served the pedagogy of early childhood". The essence of Marie Pape-Carpantier's "visual lesson" consists in facilitating a child's aspiration to cognize the world, developing their watchfulness, satisfying their needs to receive new impressions and shape a wide range of feelings, instead of just providing them with corresponding knowledge; that is, this essence is based on compliance with the principle of natural correspondence. In the pedagogue's opinion, three components should be included into a little child's upbringing to cover development of their senses, instincts, and abilities, and therefore, to take the child's nature into account. To implement the principle of natural correspondence, she organized excursions ("trips") outside of shelter rooms, which allowed to introduce children to all kinds of natural environment (in particular, plant and animal life, minerals), develop their inquisitiveness and skills in noticing and analyzing

changes taking place around them. In this regard, Marie Pape-Carpantier recommended to involve children in performing simple labor tasks to activate their physical energy (outdoor exercise), and pointed out that "through facts, these lessons teach <…> a child how to cognize themselves and the things around them" (Pape-Carpantier, 1849).

The value of a "visual lesson" consists in its reliance on a child's personal strengths and creates conditions for developing their thinking and later, for proper self-expression. According to the research conducted by B. Klein (2007), Marie Pape-Carpantier established certain rules which lay the foundation of organizing a subject lesson in a stage-by-stage manner, which characterizes its "intuitive and inductive method, beginning with facts to proceed to ideas; the active method that permanently requires a child to take effort and ensures their connection with the teacher in the search for truth". The main goal of giving "visual lessons" is the subject-based practical teaching of children which allows them to practice in performing various actions, develops a proper moral attitude, and forms corresponding skills, "<… it is the method that teaches rules only through facts, instructions only through work" (Pape-Carpantier, 1849). In this manner, as noted by B. Klein (2010), Marie Pape-Carpantier "<… tries to formalize informal cases, since she relies on unexpectedness of children's interest", that is wants to combine information on various objects perceived by children, and does it on a topic-related basis.

When speaking at the 5th conference in Sorbonne, she gave the audience such recommendations: "<… make the child look with their eyes, hear with their ears, feel with their hands - in a word, let them use their senses to convey ideas to their intellect as the inner artist which will turn these into knowledge and views…>" (Pape-Carpantier, 1869a). Due to activation of the senses, observation creates preconditions for intellectual development, since it involves enrichment of mind with new ideas and notions that will comprise the child's system of knowledge. Such ideas outline the core of Marie Pape-Carpantier's pedagogics, which can be interpreted as tasks of mental education. Particular attention was paid to giving "visual lessons" both in natural science and development of speech, where children were introduced to essentials of the country's history, geography, and literature (especially fairytales). In doing so, Marie Pape-Carpantier emphasized the need to use a vocabulary of accurate rather than simplified notions, and to form children's life (moral) values when conducting conversations on various topics (Pape-Carpantier, 1861). However, her pedagogical works lack a detailed description of the ways in which children gain their oral speech skills. Views of the French pedagogue reveal her reliance on subject-subject relationship in organizing educational process with children: "<… a pupil has to be an active agent, as active as the teacher, <…> his intelligent assistant in class… >" (Pape-Carpantier, 1869a). Marie Pape-Carpantier sets an important goal to be achieved in subject lessons which are "visual lessons" by their essence – to bring up a moral person, to form "honest and useful thoughts, since every lesson should contain its moral, just like every fruit has its seed" (Pape-Carpantier, 1861). Hence, her concept contains a clear idea of the task for moral education of the growing personality.

Pedagogical works by Marie Pape-Carpantier emphasize the special mission of a pedagogue who directs the child's upbringing, guiding its development into the necessary direction, either to prevent mistakes or to eliminate defects (Pape-Carpantier, 1849; 1969a). This is what "visual lessons" promoted, and their implementation enriched pupils' personal experience, particularly when receiving information from the teacher and communicating with other children under the teacher's supervision: "the goal is to assist the child in their natural development, support in certain moments of interruption, < … > interpret, if necessary, the experience that the nature and the world give them unexpectedly," as noted in the research work by B. Klein (2007). Therefore, according to Marie Pape-Carpantier's concept, a pedagogue's work should not be based on making children reproduce the information they received, but instead, they should be stimulated to express their own considerations and formulate conclusions, while being encouraged to explain their opinions. In fact, such attitude of the French pedagogue Marie Pape-Carpantier can be referred to as the pedagogy of "discovery" since it is based on consideration of pupils' reaction and on selection of effective exercises, which are then used to observe the situation and take appropriate action, while preserving the pupil-pedagogue relationship, as pointed out by researcher.

This should be also favored by spatial organization (material basis) of the shelter room equipped with "important and useful things" that the teacher possessing certain acting skills will tell the children about (Pape-Carpantier, 1849). The entire space ensures development of the child's perception of the surrounding world, and the contents of this space serves for their examination, observation and experiments (for example, "the travels of sand grains"), and finally for accumulation of their own life experience based on acquisition of realistic knowledge. The latter is gained by children as they labor in natural surroundings, look after plant sprouts or animals. The abovesaid encompasses tasks of labor education, although Marie Pape-Carpantier did not treat it as a separate area in her pedagogical works.

In her "Teacher's manual" (Manuel de l'institutrice, 1869a) Marie Pape-Carpantier emphasizes the importance of ensuring an active attitude for all children while organizing the educational process in the shelter room, which must become "the mother's heart of education" (Pape-Carpantier, 1869). First of all, she advised using various exercises designed for both physical and intellectual development. Due to this, as the pedagogue noted, that both physical skills and senses are improving, and this is essential for strengthening the child's body and developing their abilities and intellect. "Each little child already has a thousand desires to see and to know… and feels the need for activity; just like the body strives for movement that implements its physical qualities, the mind strives

for ideas that develop its intellectual and spiritual abilities" (Pape-Carpantier, 1869a). Hence, in Marie Pape-Carpantier's concept physical education is viewed in a close unity with mental education, although specific recommendations as to the former (physical education) cannot be tracked throughout her pedagogical works. Exposing a child's need for movement during the second conference in Sorbonne (1867), their understanding of the world through physical body and motion, she speaks about their natural aspiration to play, supplying specific examples, sometimes with sad moral consequences. In this manner, she emphasizes the role of guidance in children's play and the importance of its pedagogical appropriateness.

In the context of developing children's satisfaction and their emotional enjoyment which are innate to young souls, Marie Pape-Carpantier emphasizes the need for imagination, which is revealed during drawing classes. Such activity is related to children's demonstration of their interests, which they enjoy, since as the pedagogue says, they create images which "always suggest something," that is, "the ideas of what they have seen and what they know <...> through fixation of their memories" (Pape-Carpantier, 1869a). In this thesis, one may recognize both an outline of tasks for aesthetic education and its connection with intellectual development. Primarily, she recommends that methods applied to teach drawing should be based on children's knowledge of elementary geometrical figures that remind them of common household objects and promote development of their vocabulary in the process of describing the image they have created. As to the means involved, Marie Pape-Carpantier advises using observation of the environment, comparison of various object by shape, color, spatial location etc. She suggested a peculiar algorithm for such work: from teaching to draw lines to drawing figures and to practicing their oral description, which will help to train memory as well, since a word is always accompanied with a gesture. She transfers the same approach to teaching children to read. As to didactic materials, the suggested equipment includes boards and pencils, but children can also draw lines on sand with the help of a stick or a string pulled on a small stake. However, in Marie Pape-Carpantier's opinion, such drawing lessons are not organized to make children grow into painters (Pape-Carpantier, 1869a). Therefore, the goal of Marie Pape-Carpantier's education is to combine all aspects of this process – physical, intellectual, moral, aesthetic and labor – for harmonious development of every child attending shelter rooms. The abovesaid is represented in a generalized way in Figure 8.

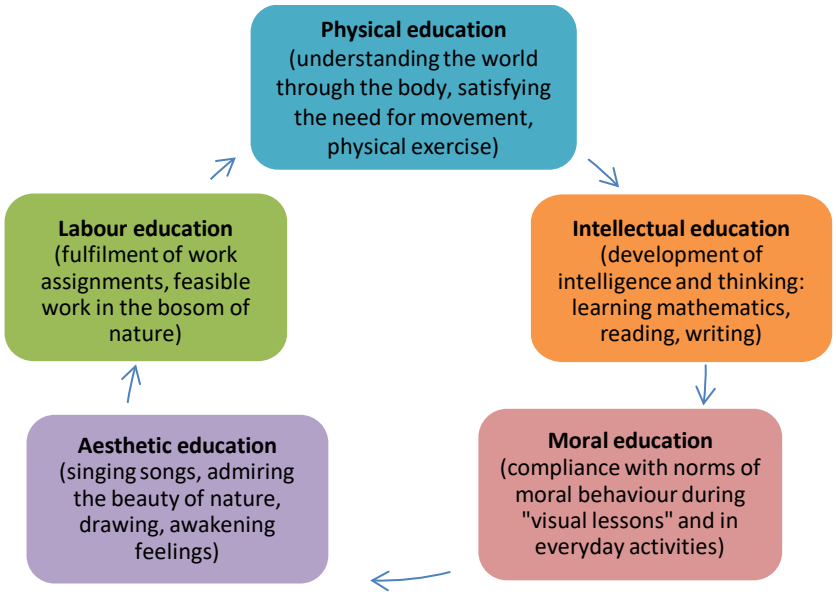

Figure 8. The concept of Marie Pape-Carpantier for organization of educational process with children of preschool age
Source: developed by the authors on the basis of their own research

On the grounds of the analyzed material, we have synthesized the main conceptual provisions characterized by Marie Pape-Carpantier in regard to development, upbringing and education of preschool children from the viewpoint of modern preschool education, which would be appropriate to implement into the contents of the educational component "History of preschool pedagogics":

- comply with the principle of natural correspondence;
- know peculiarities of individual development rate of every pupil and show respect to them;
- consider the real level of children's awareness of things around them (Régnier, 2003);
- give children knowledge as envisaged in methods of teaching elementary notions of mathematics (Régnier, 2003);
- apply visual aids, since "what one sees has a determining effect on their understanding", with emphasis on observation (Pape-Carpantier, 1869a);
- introduce a "visual lesson" as a method that "engages all intellectual, physical and moral energy if a child to

operations of understanding" the surrounding world (Klein, 2010);

- comply with the pupil-pedagogue cooperation principle that should prevail over purely mechanic imitation of certain actions by a child;
- apply practical activities (for example, singing while teaching numbers and counting), children's practice (with obligatory variation of exercises), in modern practice of preschool education this is considered as an activity-based approach – highlighted by the authors;
- form the basis of moral conduct (honesty, benevolent attitude to each other, friendliness etc);
- deliver knowledge through play (this originates the idea of play as a leading kind of activity for children of preschool age – highlighted by the authors);
- implement tasks for all-round development of a child, with an emphasis on intellectual development;
- mobilize a child's strong points, using their abilities in specific activities; "engage mind through feelings" (Klein, 2010);
- comply with the requirements for teachers: conscious attitude to practical work with children; "using one's energy to develop their interest in studies," making use of appropriate explanations and examples (Klein, 2010);
- create a full-fledged environment for development (educational space for individual trajectory of development for every pupil according to present-day requirements – highlighted by the authors).

In the works by scientists from different countries, the said problem is considered in the context of comparing the development of nursery schools in France and other European countries, particularly the UK (Burger, 2014), as well as in the United States of America (Burger, 2012). It is emphasized that introduction of public institutions for children of preschool age in various countries had some features to prove these were related phenomena, but the issue of how ideas were borrowed, and how nations exchanged ideas on the essence and peculiarities of operating such institutions is still outside the focus of attention (Dumas & Lefranc, 2010; Burger, 2014). Usually, in France, the year 1881 is seen as the date when nursery schools were founded to replace shelter rooms that had existed since the 1830s (History of nursery schools in France, n.d.). They employed pedagogues specially trained at the corresponding educational institutions (Terrieux *et al.*, 2002; Albertini & Borne, 2006). It should be noted that in the time when public preschool education in Ukraine was founded and started its development (mid-19th century – early 20th century), it was quite relevant to study advanced experience of operating nursery schools in other countries, including France. For instance, Froebel Pedagogic Society founded in 1908 in Kyiv, which organized Froebel Pedagogical Institute for Women, also engaged in translation of literature on preschool education (Lokhvytska, 2011).

Therefore, during the period of her pedagogical activity Marie Pape-Carpantier "turned her personal experience into the theory for "Ecole Normale Maternelle" and developed a peculiar educational project based on the introduction of "visual lesson" in the work with children aged from 2 to 6 in shelter rooms" (Klein, 2010). As rightly noted by C. Cosnier (1993; 2003), the pedagogical ideas suggested by this outstanding woman for organization of educational process with children in shelter rooms as predecessors of nursery schools may seem pretty common by present-day standards, but for the living conditions of 19th-century children from poor families they were extraordinarily progressive.

CONCLUSIONS

The conducted historical-pedagogical research enabled to find answers to the question concerning peculiarities in development and formation of public preschool education in France in the middle of the 19th century, based on the study of pedagogical heritage by Marie Pape-Carpantier (1815-1878). This question has been raised with consideration of the need to search for effective resources for enhancement of the preschool education system on the way to integration with the European educational space. In accordance with the outlined goal and defined tasks: (1) main stages of Marie Pape-Carpantier's pedagogical activity have been analyzed, this activity being divided conditionally in two phases: the first – immediate work with children in shelter rooms, and the second – work in training pedagogical staff, and the need to highlight historical significance of this outstanding personality in formation of public preschool education has been substantiated; (2) based on the examination of her pedagogical works and source study databases, progressive ideas of the French pedagogue in regard to development, education and upbringing of preschool children have been outlined; (3) Main achievements regarding theory of preschool education have been exposed, in particular, the principle of natural correspondence characterized by Marie Pape-Carpantier and the "visual lesson" invented for implementation of this principle as a method of interaction between a pedagogue and children that promotes completion of tasks in physical, intellectual, moral, labor and aesthetic education, with priority placed on intellectual development and with consideration of individual peculiarities of every pupil.

Marie Pape-Carpantier's developments in terms of practical work with children have been described: didactic materials, specifically in methodology of teaching mathematics (abacus, cubes, counting sticks and others), as well as her advice on equipping shelter rooms with various educational aids. Provisions regarding organization of educational process with children of preschool age have been singled out: relying on current level of knowledge, use of visual aids, compliance with principles of cooperation and activity-based approach (in particular, introduction of play), using standards of moral conduct, as well as imposing requirements for pedagogues. Prospects of the abovementioned topical research will consist in studying Marie Pape-Carpantier's main provisions as to training pedagogical staff for work with children of preschool age in public education institutions. In a wider aspect, it would

be appropriate to conduct a comparative analysis of pedagogic ideas suggested by outstanding personalities who were at the roots of preschool education of that time and dealt with issues of upbringing and education for preschool children (both European and Ukrainian), without dividing the history of preschool pedagogics into parts, but doing it in the context of a unified historical-pedagogical space, structured by certain historical period.

ACKNOWLEDGEMENTS

The idea to undertake this research was inspired by the impressions we had after watching the French biopic "La Volière aux infants" by Olivier Guignard, which came out in 2006. The plot is based on important periods in the life and pedagogical activity of Marie Pape-Carpantier as the founder of nursery school and developer of its methodical contents. This motivated us for historical and pedagogical study and analysis of materials available in online platforms (electronic libraries, websites of scientific journals etc) and enabled us to become acquainted with results of research works completed by our foreign colleagues, in particular, members of the French scientific circles: Colette Cosnier, Bruno Klein, Jean-Claude Régnier, and we would like to express our respect for the immense historical and research work they have accomplished.

CONFLICT OF INTEREST

None.

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До історичних витоків дошкільної освіти: педагогічна діяльність і концепція Марі Папе-Карпантьє (1815-1878)

Анотація. Система дошкільної освіти, що перебуває в стані трансформаційних процесів, потребує оновлення змісту і впровадження інноваційних технологій організації освітнього процесу в закладах дошкільної освіти. Для реалізації зазначеного, цінним стало звернення до ретроспективного осмислення витоків становлення системи дошкільної освіти, чим окреслюється актуальність пропонованого дослідження. Мета наукового пошуку полягала в здійсненні історико-педагогічного аналізу діяльності і концепції засновниці французької дошкільної освіти Марі Папе-Карпантьє та визначенні прогресивних позицій за сучасними вимірами. Для реалізації поставленої мети застосовувалось комплексне використання таких методів: теоретичного аналізу, синтезу і конкретизації, історико-педагогічні (ретроспективний і хронологічно-структурний), педагогічної історіографії, систематизації та узагальнення. У статті розкриваються особливості розвитку суспільного дошкільного виховання у Франції в середині XIX ст. на основі вивчення педагогічної спадщини Марі Папе-Карпантьє (Marie Pape-Carpantier) (1815-1878). Здійснено висвітлення історичного значення постаті французької педагогині Марі Папе-Карпантьє в контексті біографічних даних як щодо її безпосередньої роботи з дошкільниками в кімнатах притулку, так і щодо підготовки кадрів для таких закладів. Акцентовано на освітніх засобах, що застосовувала французька педагогиня в кімнатах притулку для здійснення фізичного, розумового, морального, трудового й естетичного виховання дітей. Виокремлено основні прогресивні ідеї щодо організації освітнього процесу з дітьми дошкільного віку: врахування індивідуального розвитку вихованців та поточного рівня їхніх знань, дотримання принципів співпраці, морального поводження, наочності, діяльнісного підходу (зокрема, застосування гри) та вимоги до постаті педагога. Наукова і практична цінність дослідження вбачається в доповненні навчального матеріалу освітнього компонента «Історія дошкільної педагогіки» інформацією про фундатора суспільного дошкільного виховання у Франції Марі Папе-Карпантьє

Ключові слова: історія дошкільної педагогіки; Франція; кімнати притулків для дітей; підготовка кадрів для роботи з дошкільниками; концептуальні положення організації освітнього процесу з дітьми дошкільного віку; дидактичні матеріали

Журнал

«SCIENTIA ET SOCIETUS»

Том 2, № 2
2023

(Англійською мовою)

Редагування англомовних текстів:
С. Воровський

Відповідальний редактор:
А. Конюх

Редагування бібліографічних списків:
А. Конюх

Комп'ютерна верстка:
О. Глінченко

Підписано до друку 01.12.2023 р.
Формат 60*84/8
Умовн. друк. арк. 15,5
Тираж 100 прим.

Journal

«SCIENTIA ET SOCIETUS»

Volume 2, No. 2
2023

Editing English-Language Texts:
S. Vorovsky

Managing Editor:
Anastasiia Koniukh

Editing Bibliographic Lists:
Anastasiia Koniukh

Desktop Publishing:
O. Glinchenko

Signed for print 01.12.2023.
Format 60*84/8
Conventional printed pages 15.5
Circulation 100 copies