

**Вікторія Стинська,**

доктор педагогічних наук, професор, професор кафедри педагогіки та освітнього менеджменту імені Богдана Ступарика, Прикарпатський національний університет імені Василя Стефаника (м. Івано-Франківськ, Україна)

**Viktoriia Stynska,**

Doctor of Pedagogical Sciences, Professor, Professor at the Department of Pedagogy and Educational Management named after Bohdan Stuparyk, Vasyl Stefanyk Precarpathian National University (Ivano-Frankivsk, Ukraine)  
*viktoriia.stynska@pnu.edu.ua*  
ORCID ID: 0000-0003-0555-3205

## «ПЕРЕВЕРНУТА ЛЕКЦІЯ» – ІННОВАЦІЯ У МЕТОДИЦІ ПІДГОТОВКИ МАЙБУТНІХ ВИКЛАДАЧІВ ЗАКЛАДУ ВИЩОЇ ОСВІТИ

**Анотація.** Статтю присвячено одній із інноваційних технологій, що активно використовується в освітній практиці в закладі вищої освіти (ЗВО) – «перевернутій лекції». На основі аналізу наукової літератури висвітлено сутність концепту «перевернута лекція», окреслено мету, завдання та засоби використання технології у ЗВО. Установлено, що всі підходи до розгортання «перевернутого навчання» (класична, просунута і змішана моделі) базуються на єдиному ключовому принципі: ознайомлення з новим матеріалом відбувається поза аудиторією, тоді як аудиторна робота присвячується практичному застосуванню отриманих знань. Досліджено, що в практиці ЗВО використовують такі типи «перевернутої лекції»: типова, орієнтована на дискусію, сфокусована на демонстрацію, псевдоперевернута, групова, віртуальна, «перевернутий викладач». На основі анкетування (опитувальники «Ефективність традиційної форми навчання» та «Ефективність перевернутої форми навчання» (Google Form)) установлено, що технологія «перевернута лекція» є гнучкою, що дає змогу сформувати динамічне і творче середовище, у якому студенти вчать критично мислити та спільно розв'язувати поставлені завдання. Зроблено висновок, що «перевернута лекція» є новацією в методиці викладання у ЗВО, оскільки має на меті зміну ролі викладачів на користь більш тісної співпраці, командної роботи та спільного внеску в освітній процес, що спонукає до зсуву пріоритетів від простої подачі навчального матеріалу до роботи над його вдосконаленням.

**Ключові слова:** «перевернута лекція», «перевернуте навчання», інновація, методика, підготовка, викладач, ЗВО.

## «INVERTED LECTURE» – INNOVATION IN HIGHER EDUCATIONAL INSTITUTION TEACHING METHODOLOGY

**Abstract.** The article is devoted to one of the innovative technologies that are actively used in educational practice in a higher education institution - «inverted lecture». On the basis of the scientific literature analysis, the essence of the «inverted lecture» concept is highlighted, the purpose, tasks and ways of using technologies in higher education are outlined. Established that all approaches to the «inverted learning» deployment (classical, advanced and mixed models) are based on a single basic principle: familiarization with new material is carried out outside the classroom, while classroom work is devoted to a practical set of acquired knowledge. It has been researched that the following types of lectures are chosen in the practice of higher educational institutions: typical, discussion-oriented, demonstration-focused, pseudo-inverted, group, virtual, «inverted teacher». Based on questionnaires (questionnaires «Effectiveness of traditional form of education» and «Effectiveness of inverted form of education» (Google Form)) it was established that the technology of «inverted lecture» is flexible, which allows forming a dynamic and creative environment in which students learn to think critically and solve the tasks together. It was concluded that the «inverted lecture» is an innovation in the teaching methodology at higher education institutions, after which it aims to change the role of teachers to obtain closer cooperation, teamwork and joint contribution to the educational process, which prompts a shift in positions from the simple presentation of educational material to work on its improvement.

**Keywords:** «inverted lecture», «inverted learning», innovation, methodology, training, teacher, HEI.

### INTRODUCTION

**Formulation of the research problem.** The 21st century is a time of transition to a high-tech information society, in which the quality of human potential, the level of education and culture of the entire population become crucial for the economic and social progress of the country. With the aim on quality of education constant improving, updating its content and forms of organization of the educational process, forming and developing a competitive personality, there is a need to create conditions for expanding life competence, forming new motivations for learning, self-organization and self-realization of the individual, introducing new methods and technologies of learning, adequate to modern trends, the demands of society and the needs of students of the digital generation and as a final result - the orientation of students for further independent life.



The challenges faced by Ukrainian higher education as a result of the COVID-19 pandemic and the new stage of the Russian-Ukrainian war of 2014–2022, which began with the invasion of the Russian army, drew the attention of the entire society to distance learning technologies, which have now become one of the development priorities education. One of such innovative technologies is the technology of «inverted learning».

**Analysis of scientific research and publications.** A review of the scientific and methodological literature showed that at the current stage the described phenomenon is relatively new in the educational practice of Ukraine. Thus, the technology of «inverted learning» is presented in the works of T. Basalgin, V. Bykov, O. Voronkin, L. Didukh, S. Litynova, M. Khomutenko, M. Kurvits, E. Mazura, O. Remezova, S. Baker, J. Bergman et al. Therefore, the problems of using the «inverted learning» technology in the professional training of future specialists of the institution of higher education (hereinafter referred to as HEI) were left out of the researchers attention, which determined the relevance of the topic of the scientific publication.

**PURPOSE AND TASKS OF THE RESEARCH** - to justify the expediency of using the «inverted lecture» technology in the process of teaching in HEI.

**RESEARCH METHODS:** systematic analysis, scientific-pedagogical and special literature synthesis and generalization.

### RESULTS OF THE RESEARCH

Modern Information Technology is just a tool, with help of which those who study can expand their discipline learning possibility and future job activity, and teachers job is to help students to obtain the skills to help them use this tools with quality for professional tasks solving in modern life. As a result, teachers strive to find new and effective methods, techniques and teaching methods that can be used in combination with traditional methods to motivate students and develop them useful in the 21st century skills, such as «Critical thinking and capability of decision making, ability to communicate and cooperation, creativity and innovativeness, information literacy, computer and media working skills, independence and initiative, flexibility and adaptability, productivity and responsibility, leadership and desire to learn and improve in life» (Tiliikina N. V., 2020).

«Inverted learning», noted M. Kademiya, is a type of educational model of mixed learning, in which the traditional presentation of a lecture is transformed into its discussion, in which debatable issues are revealed, projects are presented, practical work is carried out, etc., and the video lecture in this approach is a key component in technologies of inverted learning (Kademiia M.Iu., Yevisiukova L.S., Tkachenko T.V., 2011, p. 112).

E. Remizova emphasizes that «inverted learning is a pedagogical approach where the emphasis shifts from the collective learning space to the individual learning space.» The collective learning space is accordingly transformed into an interactive, dynamic, educational environment, where the teacher coordinates students for creative activities in the educational process (Remyzova E.H., 2014).

The history of inverted learning technology appearance is associated with the name of Salman Khan, the founder of the international educational network «Khan Academy». In 2006, he had to explain the material of school lessons to his cousins. Later, he decided to shoot a video and post it on a YouTube channel. A year later, this innovative idea was picked up by chemistry teachers Jonathan Bergman and Aaron Sams, offering it to students at Woodland School in the state of Colorado (USA). They filmed short video lectures for students to watch at home. In the classroom, practical and laboratory work was performed and students' questions were answered. Subsequently, they wrote the book «Inverted learning or how to reach every student in the lesson» and «Solving the problem of homework through the technology of inverted learning», which tells about the features of the technology and its possibilities (Stynska V.V., Prokopiv L.M., 2020, p. 148).

The experience of the «inverted learning» technology has spread rapidly in various fields of knowledge around the world. However, it is worth adding that some principles of «inverted» learning were used by teachers even earlier, until 2007. «The use of the technology «inverted classroom» in teaching a professional foreign language» is mentioned, as an example, by the professor of Harvard University - E. Mazura. It is known that he «was giving students the lecture material for preparation before class, at the beginning of the session he conducted surveys to check the learned material», and then, in small groups, worked on in-depth study of the topic and problems. The authors emphasize that «unlike traditional lectures, he did not demonstrate to students the solutions to analogical tasks, encouraging them to apply principles and theories in different situations» (Konoplianyk L., Melnykova K., 2021).

O. Pylypchuk in the review essay «Inverted» learning of informatics» provides information about the creation in 2010 of the entire «Clintondale High School» in Detroit, USA, which «became the first «inverted school», which completely inverted the principle of «inversion». According to a 2018 study by the Center for Digital Education and Sonic Foundry among members of the online community «Educational Exchange (Center for Digital Education)», «half of American university teachers are already using inverted learning in their classrooms» (Markova N., Shmatok A., 2018).

In the sphere of Ukrainian higher education, the technology of «inverted learning» has been actively included in HEI educational processes since 2014 in teaching various subjects (O. Volnevich, L. Korol, O. Malykhin, I. Pyankovskoi, K. Yalova, K. Yashina T. Yarmolchuk and others).

In scientific literature, the categories «inverted learning», «inverted classroom», «inverted lecture» are considered synonymous. This allows us to consider the peculiarities of the «inverted lecture» organization, using all concepts.

Combining the traditional system of education and online education, the technology of «inverted learning» is practically a kind of «blended learning». This technique is based on the psychological concept that it is through the visualization of the content one can learn the material much better.

The technology relies on concepts such as active student learning, hybrid course design, and podcasting (a digital media file that can be distributed over the Internet). It is this technology that establishes a structure that provides students



with the opportunity to «receive individual education taking into account their individual needs», to learn from each other (Hladun M., 2019).

The purpose of the «inverted lecture» is to provide comfortable educational conditions that contribute to the productive educational, cognitive and practical participants activities of the educational process, the self-development of the student's personality and the formation of their life competence, as well as the ability to transform the received information, to transfer it from a cognitive level to a constructive, active one.

The implementation of the «inverted lecture» in the educational process contributes to solving the following tasks: ensuring that each student reaches his or her own level of development through an individual pace of work; promoting the formation of the student's professional competencies through a comprehensive approach to education; formation of intellectual and cognitive abilities of students; development of creative activity, practical and research skills of students; provision, stimulation of self-development and self-actualization of the individual; increasing the level of educational achievements of students; ensuring the conscious assimilation of basic knowledge due to their universal use in various situations.

The following types of inverted lectures are found in the practice of foreign education:

*The Standard Inverted Classroom.* Students they receive homework, which involves watching video lectures, familiarization with materials related to the topic of the next class, during which theoretical knowledge is applied in practice, and teachers have additional time for individual work with each student.

*The Discussion-Oriented Flipped Classroom.* Students are given the task of watching certain videos or materials from Internet resources, and the teacher organizes a discussion of the received information during the lesson.

*The Demonstration-Focused Flipped Classroom.* This form will be effective for teaching those subjects that require demonstration of materials, conducting visual experiments. The teacher demonstrates the necessary activity, and the students perceive and analyze it, and then independently perform the assigned tasks.

*The Faux-Flipped Classroom.* The use of this form will be appropriate if there is no certainty that students will prepare independently at home. Such a model allows students to watch videos in pairs, and then perform the corresponding tasks and, if necessary, receive individual consultations from the teacher.

*The Group-Based Flipped Classroom.* This model encourages students to learn from each other, to get the right answers in the process of interactive interaction, to find effective ways of obtaining information, ways of conducting scientific research, etc. In order to apply the model, students should, at their own request or on the teacher's recommendation, form groups and familiarize themselves with the relevant materials. And in classes, work together on a certain scientific problem.

*The Virtual Flipped Classroom* allows to organize students' work so that the entire learning process takes place remotely: the teacher offers students material to review, downloads practical tasks, provides online advice, conducts tests and assigns final scores. The main thing is to start studying the relevant material by working out the theory independently.

«Flipping The Teacher» assumes that the teacher does not necessarily have to do all the work - prepare or search for video materials, form practical tasks, advise, check works. Certain types of work can be performed by students, and the teacher will observe how the learning process will be organized, how information will be presented and will provide, if necessary, assistance (Kovtun O. A., Krykun V. S., 2019).

There are a number of approaches to the deployment of «inverted learning», but all of them are based on the same basic principle: familiarization with new material takes place outside the classroom, while classroom work is devoted to practical application of the acquired knowledge:

1. The «classic» model of «inverted learning» involves the student's preliminary familiarization with the theoretical material of the upcoming lesson. Preparation materials can be provided both in the form of a reference outline of lectures or a textbook paragraph, and in the form of slides, video and audio documents. It is worth noting that despite the fact that training is partially conducted remotely, this model continues to resemble the traditional education system.

2. The «advanced» model of «inverted learning» also has two stages - outside the classroom and in the classroom and involves a gradual complication of the level of tasks and expansion of activities. In the process of preliminary preparation, students independently search for information on a given topic, read articles, watch videos, in minigroups or individually prepare theses that they will present in the audience, questions for debates or a round table. They post the results of their work on a common electronic platform so that the teacher and other students can familiarize themselves with them in advance and better prepare for the class

3. The «systemic» or «combined» model involves combining the first two models. The essence of this model is not to change the place of performance of a certain type of activity, but to change the key components of the educational process. The traditional sequence of involved competencies (memorization, understanding, applying, analysis, synthesis, evaluation) is changing. First, the practical application of the theory or model is studied, and only then its theoretical justification (Lishchynska O., 2022, p.106).

Thus, in the conditions of a non-traditional lecture, the teacher's preparation process for it is different compared to the preparation for a traditional one. The lecturer advises students, monitors and analyzes the results of their testing, reviews questions received from students. Based on the results of such preparatory work, he adjusts the content of the next lecture, plans the form of its delivery. During the lecture itself, the teacher organizes an active discussion by students of the lecture issues, gives them the opportunity to make additions, share interesting information found during the preparation for the lecture.

Therefore, the «inverted lecture» is a form of active learning that allows you to «invert» the usual learning process in the following way: the traditional presentation of the lecture is transformed into a discussion, in which debatable issues

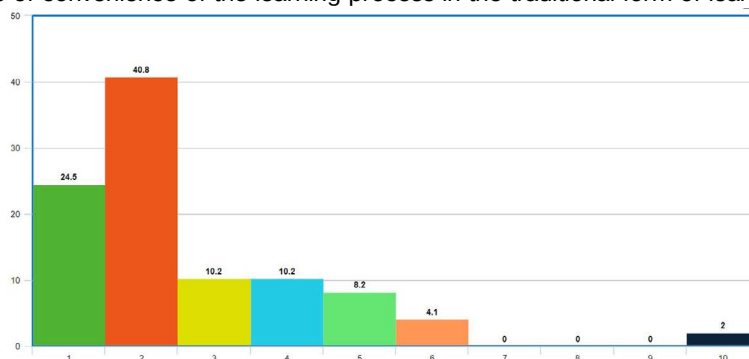


are revealed, projects are presented, practical work is performed, etc., and a video lecture with this approach is a key component. Also intersecting with problem-oriented learning, this technology «has significant flexibility and ensures greater involvement of students in the educational process, allows to form a dynamic and creative environment» in which students learn to think critically and solve tasks together.

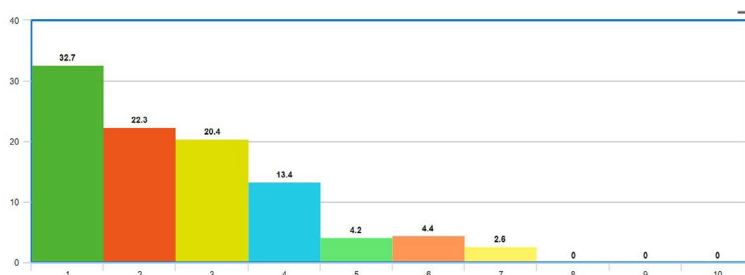
In order to identify the effectiveness of using the inverted learning model, the questionnaires «Effectiveness of traditional form of learning» (Google Form) and «Effectiveness of flipped form of learning» were developed.

Figure 1. Results of the survey «Effectiveness of the traditional form of education»

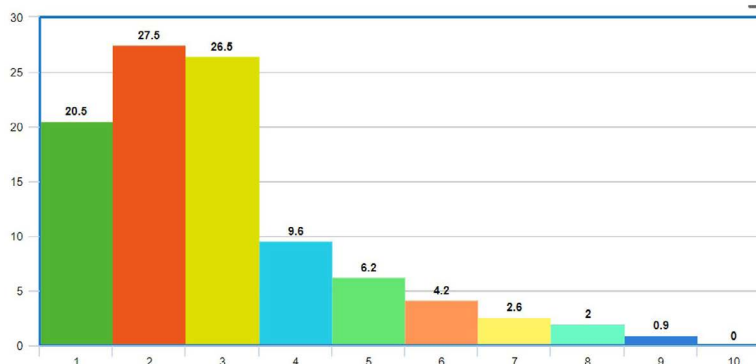
1. Evaluate the degree of convenience of the learning process in the traditional form of learning.



2. Evaluate the possibilities of the traditional form of education in force majeure circumstances.



3. Evaluate the possibilities of the traditional form of education when working on problematic issues?



4. Evaluate the role of the teacher in the traditional educational process (explains the lecture material and evaluates the level of educational achievements of students).

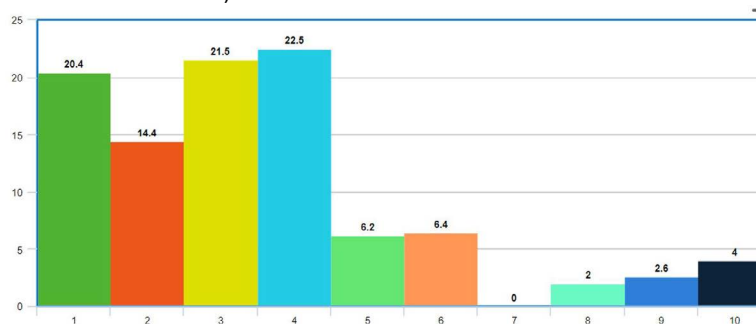
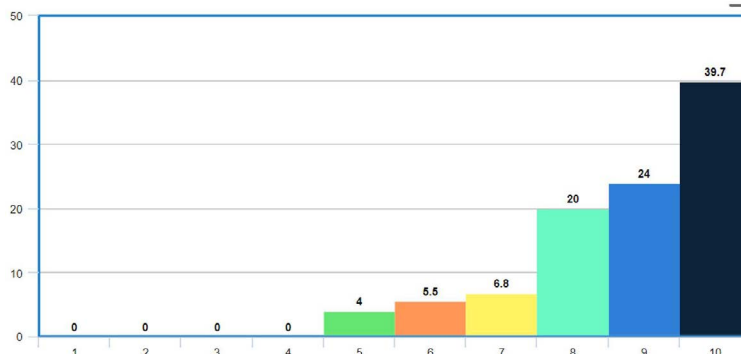


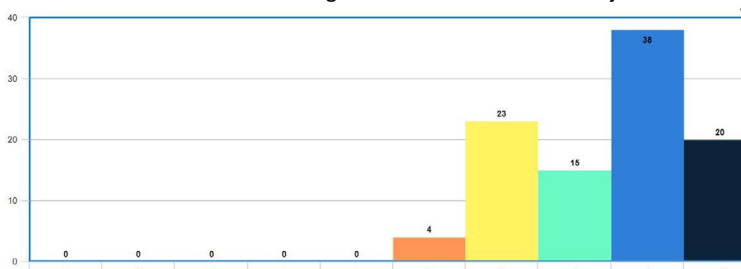


Figure 1. Effectiveness of inverted learning

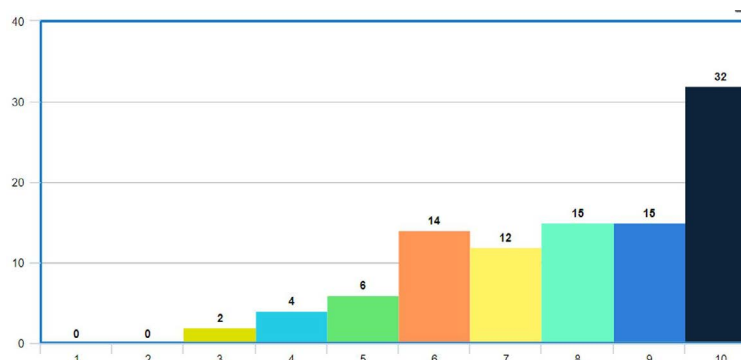
1. Evaluate the degree of convenience of the learning process using the «inverted lecture».



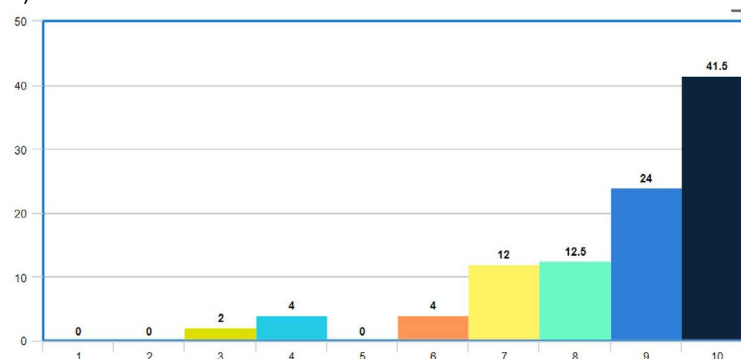
2. Evaluate the possibilities of the inverted learning of education in force majeure circumstances.



3. Evaluate the possibilities of the inverted learning of education when working on problematic issues?



4. Evaluate the role of the teacher in the inverted educational space (answers problematic questions, gives feedback, can work in individual mode).



So, after the experiment, the following conclusions can be drawn: in contrast to the traditional: inverted learning is flexible, individual (96%), provides an opportunity for differentiation, learning in crisis conditions (96%), working on problematic issues (84%); inverted learning by 92% changes the role of the teacher, who turns from the main translator of knowledge into a facilitator (assistant, consultant, organizer and coordinator) of various types of student activities, which contributes to his closer cooperation with students during the educational process and the formation of certain competencies



Despite the described advantages of «inverted learning», there are a number of significant obstacles to its effective use, namely: increasing the barriers to entering the «inverted classroom» models and the appropriate level of IT competence for all participants; requires teachers to carefully prepare and record video lectures and podcasts, which is quite active additional work in course preparation. Currently, it is not possible to consider the individual system plans of the teacher's working time for such courses; inability to work independently (an important problem is the incompetence of students and their unwillingness to systematically do homework); reluctance to change the learning process at the level of heads of higher education institutions. World practice shows that not all teachers within higher HEI positively perceive the use of the inverted lecture model. Some of them fundamentally deny such changes; too much load on teachers. The preparation of high-quality materials requires extensive information processing.

### CONCLUSIONS AND PROSPECTS OF FURTHER RESEARCH

Thus, the inverted lecture demonstrates the unique, practically unlimited potential of the Internet, its significance in terms of self-education. The network acquires the importance of a source of knowledge, a method of broadcasting and gaining practical experience, creates a real possibility of change from «incubating» and «breeding» in a couple to the formation of an active life position of a person as an equal subject of the educational process, the development of professional competencies on the subject material.

Therefore, the «inverted lecture» can be considered an innovation in the teaching methodology, as it aims to change the role of teachers in favor of closer cooperation, teamwork and joint contribution to the educational process, which prompts a shift in priorities from the simple presentation of educational material to work on its improvement .

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