# EDULEARN23

15TH INTERNATIONAL CONFERENCE ON EDUCATION AND NEW LEARNING TECHNOLOGIES

PALMA (SPAIN)
3RD-5TH OF JULY, 2023

# CONFERENCE PROCEEDINGS

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# Preface

Welcome to the conference proceedings of EDULEARN23. This compilation of papers and research findings were written by a diverse array of education experts and scholars who participated in the 15th EDULEARN conference, held in Palma, Spain from the 3rd to the 5th of July 2023. The conference brought together academics and researchers from the field of education to exchange knowledge, inspire new ideas and share their insights.

The theme of EDULEARN23 covers the fields of education and educational research. EDULEARN23 provided different keynote speeches, parallel thematic sessions, networking activities, workshops, and interactive sessions. The extensive number of international experts who attended the conference allowed attendees to network and share innovative ideas, promoting cross-country collaboration. The keynote speeches are available at IATED Talks (iated.org/talks/).

The EDULEARN23 Proceedings, which are exclusively in English, include the accepted contributions presented at the EDULEARN Conference, which will be included in the IATED Digital Library (library.iated.org). They represent the collective efforts of the authors to advance knowledge in their field. The EDULEARN23 International Program Committee is composed of lecturers and researchers from many different countries. A blind peer review process was followed in order to guarantee the quality and relevance of the final publication. During this process, the following points were evaluated: information content, relevance to the educational field, general structure, clarity of contents, originality, and relation to the conference topics and disciplines.

EDULEARN endeavours to meet the expected ethical standards when publishing conference proceedings that contain high-quality original research articles. All authors that published their papers in the EDULEARN23 Proceedings signed the IATED copyright transfer form. IATED guarantees the high technical and professional quality of the publications, and that good practice and ethical standards are maintained. More information about IATED publication ethics is available at: https://iated.org/publication_ethics.

We extend our sincere gratitude to all the authors who submitted their valuable work to these EDULEARN23 Proceedings. We also wish to express our gratitude to all participants and attendees for their engagement, dedication, and passion for education.

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## Keynote Speakers

Ashok K. Goel – *Georgia Institute of Technology, United States*
Donald Clark – *Wildfire, United Kingdom*

### Ashok K. Goel – Georgia Institute of Technology (USA)

***Keynote speech:***
***Teaching and Learning in the Age of AI***

Millions of adults of various ages need reskilling and upskilling in our technological society. These millions of adult learners offer a new, large, and diverse challenge to education. Given that many adult learners cannot leave their jobs or families, online education offers a medium for reaching them where they live and work. Online education also provides access to unprecedented amount of data on learners and learning. Our vision at the National AI Institute for Adult Learning and Online Education (AI-ALOE) is to develop novel AI cognitive assistants that work with this data to enhance the quality of adult online learning through personalization of learning. Successful realization of this vision requires progress on understanding the motivations, needs, and capacities of adult learners, participatory design of AI cognitive assistants, human-AI collaboration, large-scale learning analytics, and an infrastructure for deploying the AI cognitive assistants, collecting and analyzing the data on learning, and feeding the results to the cognitive assistants, teachers, and learners alike. I will describe the research program at AI-ALOE in some detail.

***Biography:***
Ashok K. Goel is a Professor of Computer Science and Human-Centered Computing in the School of Interactive Computing at Georgia Institute of Technology, and the Chief Scientist with Georgia Tech's Center for 21st Century Universities. For more than thirty-five years, he has conducted research into cognitive systems at the intersection of artificial intelligence and cognitive science with a focus on computational design and creativity. For the last decade or so, much of his research has focused on AI in education and education in AI. He is a Fellow of AAAI and the Cognitive Science Society, an editor emeritus of AAAI's AI Magazine, and a recipient of AAAI's Outstanding AI Educator Award. Ashok is the Executive Director of the recently established National AI Institute for Adult Learning and Online Education.

**Donald Clark – Wildfire (UK)**

***Keynote speech:***
***AI changes everything!***

Generative AI will change the way we work, therefore what, why and how we learn. Its profound impact on both work and learning will be presented showing that the consequences are both profound and unexpected. The role of the teacher and upskilling will also be explored.

***Biography:***
Donald Clark is a Learning Tech Entrepreneur, CEO, Researcher, Blogger and Speaker. He was CEO and one of the original founders of Epic Group plc, which established itself as the leading company in the UK online learning market, floated on the Stock Market in 1996 and sold in 2005. He has been involved at all levels of investment – angel, VC, growth, PE and IPO. As well as being the CEO of Wildfire an AI learning company, he also invests in, and advises, EdTech companies.
An investor and board member of learning companies Cogbooks (sold in 2021 to Cambridge University) and Learning Pool (sold 2021 for $200 million), he was also on the Boards of City & Guilds, Learn Direct, University for Industry and the Brighton Dome and Festival. Wildfire delivers AI products and consultancy. He has published 3 books, the first on AI, second on Design for technology and the third, published next month on Learning Technology. His fourth book on Learning in the Metaverse has just been commissioned.
Donald has over 37 years' experience in online learning, video, games, simulations, adaptive, chatbot, social media, mobile learning, virtual reality and AI projects. He has designed, delivered and advised on online learning for many global, public and private organisations.
An evangelist for the use of technology in learning, he has won many awards, including the first 'Outstanding Achievement in E-learning Award' and 'Best AIM Stock Market Company', 'Most Innovative Online Product', 'Best Online Learning Project and 'JISC EdTech Award'.
An award winning speaker at national and international conferences, he has delivered keynotes in the UK, Europe, US, Africa, Australia, Middle and Far East.
…… also a regular blogger (15 years+) on learning technology.

# Conference Tracks & Sessions

The EDULEARN23 conference program is available online at https://iated.org/edulearn23

## ORAL SESSIONS MONDAY

Technology-enhanced Learning
Computational Thinking Skills for the Digital Age
Soft Skills & Socio-Emotional Learning
Adapting Education in the Post-Pandemic Era
Programming and Computer Science Education
Experiences in Primary & Secondary Education
Experiences in Tourism Education
Technology-Enhanced Mathematics Education
Virtual Reality in Education
Creativity & Critical Thinking
Assessment and Evaluation Strategies (1)
Impact of COVID-19 on Education
Integrating Robotics and Programming in Educational Settings
STEM Education in Schools (1)
Technology-enhanced Language Learning
Teaching STEM Subjects
Generative AI for Innovative Teaching and Learning
Game-Based Learning
e-Assessment
Innovative Tools for Learning
Experiences in Engineering Education
Inclusive Education
Language Teaching and Learning
Experiences and Innovations in Mathematics Education (1)
AI in Education
Project and Problem Based Learning
Assessment and Evaluation Strategies (2)
Videos for Learning
Digital and Media Literacy
Supporting Special Education
English for Special Purposes & English as a Medium of Instruction
Experiences and Innovations in Mathematics Education (2)

## POSTER SESSIONS MONDAY

Pedagogical Innovations and Trends in Education
Emerging Technologies in Education

## ORAL SESSIONS TUESDAY

Social Media & Digital Skills
Plagiarism and Academic Dishonesty
e-Portfolios & Reflective Assessment
Experiences in Higher and Further Education
Professional Development of Teachers (1)
Student and Teacher Wellbeing
Experiences in Business Education
Service Learning & Community Engagement
Integrating Virtual Reality in Education
Learning Analytics (1)

International Projects & Mobility Experiences
Workplace & Lifelong Learning
Professional Development of Teachers (2)
Student Support
Experiences in Health Sciences Education
Education for Sustainability (2)
Virtual & Augmented Reality
Learning Analytics (2)
Active and Experiential Learning
Internships and Work-integrated Learning
ICT Skills among Teachers
Educational Management (1)
New Technologies in Health Sciences Education
STEM Education in Schools (2)
m-Learning
e-Learning Experiences
Gamification and Game-Inspired Learning
Personalized and Self-Regulated Learning
Teacher Training
Educational Management (2)
English as a Foreign Language
Innovations in STEM Education
Chatbots & AI in Education
From Face-to-Face to Remote Learning
Blended & Hybrid Learning
Entrepreneurship Education
Pedagogical Innovations
University-Industry Cooperation
Education for Sustainability (1)
Professional Development of STEM Teachers

## POSTER SESSIONS TUESDAY

Experiences in Education
New Challenges in Education and Research

## VIRTUAL SESSIONS

### DIGITAL TRANSFORMATION OF EDUCATION
Data Science & AI in Education
Learning Analytics & Educational Data Mining
Digital Transformation
Digital and Media Literacy
Educational Programming & Robotics
Computer Games and Educational Software

### INNOVATIVE EDUCATIONAL TECHNOLOGIES
AI, Chatbots & Robots
Virtual & Augmented Reality
Social Media in Education
Technology Enhanced Learning
Videos for Learning
Simulation & 3D Technologies

### DIGITAL & DISTANCE LEARNING
Distance Education in COVID-19 Times
Challenges and Practices during the Pandemic and Beyond
Blended & Mobile Learning
Open Educational Resources
Learning Management Systems & Virtual Learning Environments

**ACTIVE & STUDENT-CENTERED LEARNING**
Gamification & Game-based Learning
Experiential & Cooperative Learning
Problem & Project-Based Learning
Flipped & Hybrid Learning
Pedagogical Innovations
Creativity & Critical Thinking

**ASSESSMENT, MENTORING & STUDENT SUPPORT**
Assessment & Evaluation
Mentoring & Tutoring
Student Support & Motivation
Developing Soft and Transversal Skills

**TEACHER TRAINING & ED. MANAGEMENT**
ICT & Digital Skills
Professional Development of Teachers
Educational Management

**QUALITY & IMPACT OF EDUCATION**
Quality in Education
Experiences and Challenges in Curriculum Design
Sustainability & Social Impact of Education
Links between Education and Research
University-Industry Collaboration
Mobility & International Projects

**EDUCATIONAL STAGES & LIFE-LONG LEARNING**
Early Childhood & Primary Education
Vocational Education
Transition to the Job Market & Entrepreneurship
Life-Long & Workplace Learning

**MULTICULTURALITY & INCLUSION**
Multicultural Education
Diversity Issues
Special Educational Needs
Inclusive Education

**DISCIPLINE-ORIENTED SESSIONS**
Architecture & Interior Design Education
Health Sciences Education
Computer Science Education
Business & Tourism Education

**LANGUAGE LEARNING AND TEACHING**
Foreign Languages
Language Learning & Translation Studies
New Technologies in Language Learning

**STEM EDUCATION**
Mathematics & Statistics
Engineering Education
STEM Experiences

# “FLIPPED CLASSROOM” – THE FUTURE OF MODERN TEACHING

**A. Vitanova-Ringaceva, D. Kuzmanovska, V. Koceva, B. Ivanova, S. Kirova**

*University "Goce Delcev" Stip (MACEDONIA)*

## Abstract

Traditional teaching in higher education implies the image of an active teacher, and a student as passive listener. Such arrangement of the main stakeholders of the educational process implies the application of outdated teaching methods, and, as a consequence, reduced motivation for learning, defocusing and concentration problems during lessons appear. The objectives of modern teaching are clear and obvious: creating a healthy and inspiring learning environment, encouraging independent learning skills, producing students ready for vertical thinking, motivating teaching staff who will convey the contents in a way adapted to the principles of modern teaching. Modern teaching implies the application of modern interactive methods and techniques of work, with the direct involvement of students not as passive listeners and recipients of ready-made information, but as creators of the teaching process. To achieve that, it is also necessary to use the modern technological means that have become part of online teaching. The use of new technologies is particularly significant when the "flipped classroom" method is applied, in which students have access to the audio-visual content that is used in the performance of the tasks given by the teacher. In fact, the teacher prepares, or directs the student to virtual sources of knowledge, which represent a kind of a learning resource. Namely, the "flipped classroom" itself is the opposite of traditional teaching. Students are given tasks to research the topic that will be the focus of the following lectures. In the meantime, the teacher prepares appropriate challenges, a kind of homework that students prepare before the realization of the lesson during which the professor is to familiarize them with the appropriate teaching content. Such an approach puts students in a proactive position to be direct participants in the process of designing the lesson and to be able to lead it.

We have conducted thorough research within the teaching process in which we included students studying philological sciences, in order to perceive the functionality of the "flipped classroom" method in higher education. The research included students and professors from the following Departments: Macedonian Language and Literature, English Language and Literature, Italian Language and Literature and German Language and Literature. In the first part of the research, we conducted an electronic survey among students to get information about whether they have any knowledge about the "flipped classroom" method and whether they were part of the teaching in which it was applied. The second part of the research consisted of workshops in which the team of teachers properly introduced the students to the "flipped classroom" method, which actually represented a preparation for the third phase of the research in which they had to apply this method to the teaching unit Phraseologisms in the language that they study. The goal of our research is to guide students to think in the direction of using the modern teaching methods current worldwide. The obtained results, as well as the research strategies, will be attached in schematic representations and tables.

Keywords: flipped classroom, students, contemporary teaching, higher education.

## 1 INTRODUCTION

The latest research dedicated to the quality of teaching at all levels of education shows that overcoming the current combination of traditional versus modern teaching, implies the use of modern teaching methods in which pupils/students should be proactively involved. Creating a healthy and inspiring learning environment will produce students with lasting knowledge and encourage their critical thinking. One of the modern teaching methods that positions the student in the center is the "flipped classroom" method. The method itself implies previous preparation of students and teachers for the teaching content set as a goal for adoption. The "flipped classroom" method implies an active student and a prepared teacher. Students have wide opportunities to use modern digital tools, as well as the Internet resources, which are necessary for the practical application of this method. On the other hand, the teacher, who has a passive role during the class in which this method is applied, should be "awake" and ready for students' questions. Those questions arise because students try to fully understand and elaborate on the material.

In order to show the practical application of this method within the framework of teaching in higher education, as a team of professors we have made a thorough study. First, we selected students who wanted to be involved in this research, indicating that they would be involved in three ongoing phases. In the first phase, we conducted an electronic survey among students from the departments: Macedonian language and literature, English language and literature, German language and literature, and Italian language and literature (all of them with teaching major). The students received a questionnaire with 8 questions and the possibility to answer by means of the five-point Likert scale. After the results obtained from the survey, we moved on to the second phase of the research. It consisted of the realization of interactive workshops with students and professors. During those workshops, the team of professors-researchers through practical examples showed the students how the "flipped classroom" method is actually applied in higher education, indicating that the same models can be used by them as future teachers of the language they study. Students were given a type of homework that allowed them to independently explore the intended teaching unit using multimedia content available online. In their preparation for the tasks, the students prepared lists of research tasks that they had to fulfill. The third and most important phase gave the students the opportunity to apply this method themselves. As a task, they were given phraseologisms as separate language units suitable for this type of research. Students were given the task of researching these phraseologisms in the language that is the subject of their study. After completing the research process, the students attempted to apply the model. At the end, they also received a second questionnaire in which questions referring to the conclusions from the application of the "flipped classroom" teaching method and the possibilities it opens were given.

## 2 METHODOLOGY

The research methodology involves: a defined type of research with previously set objectives, a research approach through the use of a survey, and participation in a workshop where appropriate tools and objects are used. Our research paper followed a qualitative research approach. The methodology includes modern approaches of implementation and verification of the obtained results.The goal of our research was to direct students to think in the direction of using modern teaching methods that are current in teaching worldwide. The use of new technologies is particularly significant when applying the "flipped classroom" method, in which students have access to audio-visual content that is used in the performance of the tasks given by the teacher. We achieved the main goals by asking the following questions:

- Do professors apply modern learning and teaching methods in modern teaching?
- Are the students familiar with the "flipped classroom" method and did they participate in the teaching in which it was applied?
- How applicable can the "flipped classroom" method be to the study of phraseologisms?

The results obtained from our research are extremely significant for improving and modernizing the approach to modern teaching in higher education.

HYPOTHESES

1 In modern teaching at the institutions of higher education, the "flipped classroom" method is still insufficiently used.

2 The "flipped classroom" method is useful and gives solid results in the study of phraseologisms as linguistic units.

## 3 RESULTS

Our research included a total of 60 students from the first to the fourth year: 18 students of the Macedonian language and literature study program, 25 students of the English language and literature, 12 of the German language and literature and 5 of the Italian language and literature. The students were between the ages of 19 and 23, and, in terms of gender, female students predominate, which of course has no special impact on the results of the research. The questionnaire was prepared and the survey was carried out by the subject professors of the Macedonian language and the foreign languages that are included in the teaching. The goal of the research is to prepare students, as future creators of teaching within the framework of the educational process, to use modern teaching methods. Using the "flipped classroom" method was a new experience for them. The workshops within which the students had the opportunity to see the practical application of the indicated method gave the expected results.

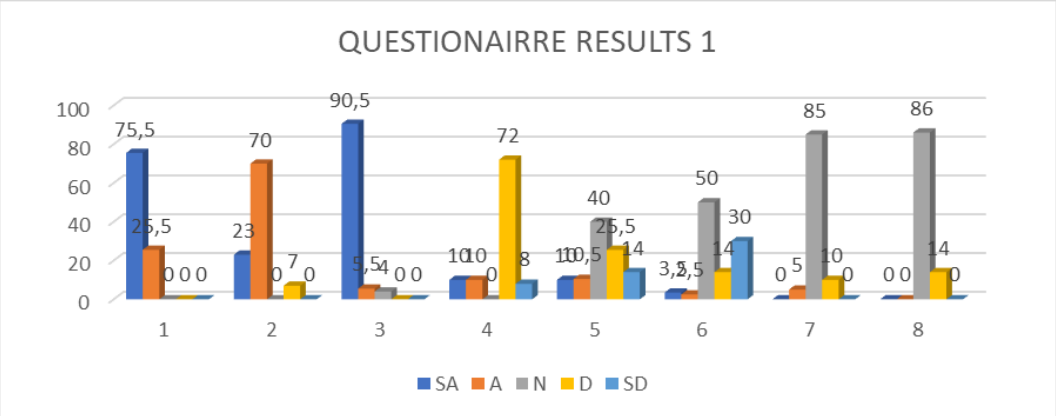
## 3.1 Questionnaire

### *3.1.1 The first part of questionnaire*

A two-part questionnaire was sent to the students-participants as the most suitable instrument for verification, and they were given time to complete it. The survey was conducted during classes. The first part of the questionnaire contains 8 questions about the way modern teaching takes place, that is, about the active or passive participation of students in it. The students' task was to give their individual answers. By applying the five-point Likert scale: SA (strongly agree), A (agree), DK (don't know), D (disagree) and SD (strongly disagree), we obtained results that confirm the set hypotheses. The questionnaire consists of two parts; the first is to fill in the column that you think corresponds to the given statement according to the indicated symbols: SA (strongly agree), A (agree), DK (don't know), D (disagree) and SD (strongly disagree). Please proceed to filling out the first part of the questionnaire, and the second part follows below with appropriate clarification.

*Table 1. Questionnaire*

| | ***SA*** | ***A*** | ***DK*** | ***D*** | ***SD*** |
|---|---|---|---|---|---|
| The professor lectures and the students are passive listeners | 75,5% | 25,5% | / | / | / |
| The professor teaches with the active participation of the students | 23% | 70% | / | 7% | / |
| The professor is the creator of the lesson | 90,5% | 5,5% | 4% | / | / |
| The professor creates the lesson together with the students | 10% | 10% | / | 72% | 8% |
| The professor applies modern teaching methods | 10% | 10,5 % | 40% | 25,5% | 14% |
| The professor uses the "flipped classroom" method | 3,5% | 2,5% | 50% | 14% | 30% |
| The flipped classroom method actively involves students | / | 5% | 85% | 10% | / |
| Through the "flipped classroom" method, permanent knowledge is obtained | / | / | 86% | 14% | / |

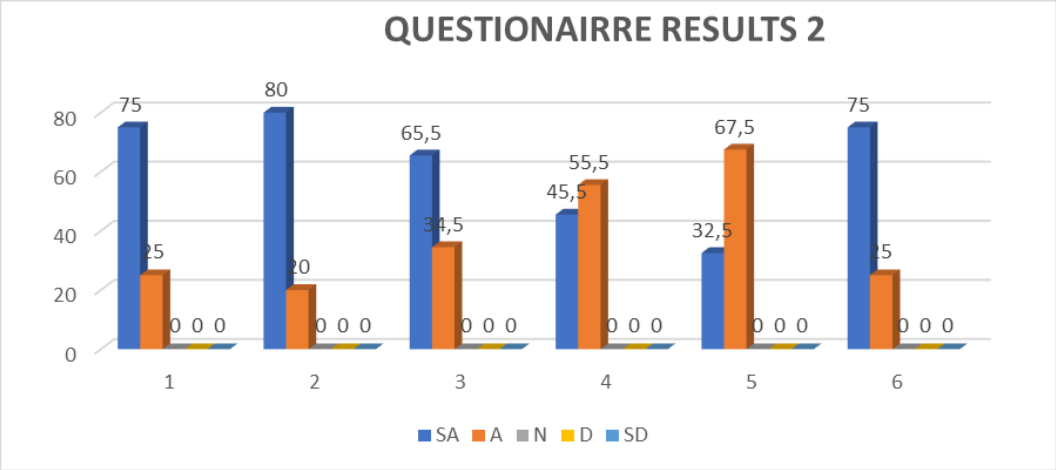



### *3.1.2 The second part of questionnaire*

The second part of the survey includes a questionnaire that the students are to fill out after the workshop. It is a tabular presentation showing the results of the workshops in which the students and professors participated. Namely, professors using the "flipped classroom" method direct students to independent research using modern audio-visual means. The students' task is to answer the questions based on their experience with the application of this method.

*Table 1. Questionnaire*

| | SA | A | N | D | SD |
|---|---|---|---|---|---|
| The "flipped classroom" method provides ample opportunities for research | 75% | 25% | / | / | / |
| The students are put in the position of researchers | 80% | 20% | / | / | / |
| The method enables the acquisition of permanent knowledge | 65,5% | 34,5% | / | / | / |
| Learning phraseologisms is easier when this method is applied | 45,5% | 55,5% | / | / | / |
| The frequency of phraseologisms in the written and spoken text of the language I study is easily detected by applying this method | 32,5% | 67,5% | / | / | / |
| The “flipped classroom” method is the future of modern teaching | 75% | 25% | / | / | / |




## 4 CONCLUSIONS

In the first phase of the research, the students-participants received a questionnaire consisting of 8 questions. After completing the survey, the team of researchers obtained the following results: 75.5% of respondents completely agreed that, during lectures, students were passive listeners, and 25.5% agreed with the statement. 70% of students agreed that they actively participated in teaching, 23% strongly agreed with that, and 7% disagreed. The high 90.5% of students who were convinced that the professor was the sole creator of the lesson, while 5.5% agreed with that, and 4% did not know the answer, are particularly impressive. In contrast to these high percentages, there are 72% of students who did not agree that they were also involved in the creation of the lesson, 8% strongly disagreed, and 10% agreed with the statement. The last three questions referred to the application of the "flipped classroom" method. When asked about the application of this method by the professor, 50% did not know how to answer the question, 14% disagreed, a high 30% strongly disagreed, and an insignificant 3.5% and 2.5% strongly agreed and agreed. About whether the method actively involves students in teaching, even 85% of students did not know, 10% disagreed, and only 5% agreed. When asked whether permanent knowledge is gained through this method, 86.5% did not know how to answer, and 14% disagreed.

The second part of the research included the implementation of workshops using the "flipped classroom" method. The survey that the students completed showed that 75% strongly agreed with the statement that the indicated method offered wide possibilities for research. In this regard, 80% strongly agreed that they were put in the position of researchers, supplemented by 20% of respondents who agreed. 65.5% strongly agreed that by applying this method permanent knowledge was acquired, which is certainly a high percentage. Regarding the specific content that was given to them as a topic to which they could apply the method, as many as 55.5% believe that this method finds a solid application in the study of phraseologisms. The thesis that the frequency of phraseologisms in the written and spoken text of the language they study is easily detected by applying this method is supported by 67.5% of the respondents who strongly agree. And finally, 75% of the surveyed students completely agreed with the view that the "flipped classroom" method is the future of modern teaching, which is certainly a solid result achieved through the practical application of the indicated method.

The research team of professors together with the students-participants in this research achieved the goal that was set. Namely, the research showed that students know very little about the "flipped classroom" method and its application. Professors, on the other hand, resort to the application of traditional teaching models, which slows down the modernization process. After the implemented workshops in which the professors-researchers and the students actively participated, it was shown that the application of this method could bring positive changes in the teaching process in higher education.

The students who were given the tasks to investigate phraseologisms as linguistic units and compositions in the language they study, were maximally involved in the application of the method. The method enabled them to adopt the new content that they were to master during the lesson in a greater percentage through individual homework and the application of modern digital tools. They used the Internet space as a source of data and made their own presentations on the teaching content phraseologisms. The students, put in the role of active bearers of the lesson, saw all the positive aspects that the application of the "flipped classroom" method brought. They, as future active stakeholders in the educational process, have already mastered the skills needed for the application of this method.

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