

*methodological literature, generalization, systematization – to reveal the content of basic concepts, approaches, models of the studied phenomena; empirical – pedagogical observation of educational and cognitive activities of students of profile classes. It is noted that introduction of productive learning is not systematic, school practice still adheres to reproductive traditions, but the biology profile is tasked with developing students' intellectual potential, creativity, independence. The article substantiates the didactic possibilities of productive learning in the context of formation of students' biological competence in profile classes: realization of students' subject interests and cognitive needs, high level of learning motivation, strength and efficiency of knowledge, creative skills, possibility of self-realization, achievements in learning and self-education. Implementation of productive learning requires effective forms, methods, techniques and tools: the use of elements of developmental, problem-based, project-based, interactive, personality-centered, program-based, modular learning. The stages of productive learning organization, the features and criteria of biological competence formation, teachers' functions, results of students' educational activity are substantiated. The results of productive learning are: students' original educational products, namely: effective mastery of content, biological concepts, interdisciplinary and intradisciplinary, causal relationships, logical reasoning; algorithms for solving cognitive tasks; ability to set goals and identify problems, ability to plan and conduct experiments, as well as analyze their results; awareness of the essence of phenomena and processes, evaluative judgments; ability to substantiate hypotheses, experience in solving practical problems. Productive learning provides students with the opportunity for further professional choices based on acquired biological competence.*

**Key words:** *productive learning, reproductive learning, profile education, subject competence, biological competence, profile classes, independent cognitive activity, self-determination.*

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## **MULTIMODALITY AND BIMODALITY IN THE DIGITAL EDUCATIONAL ENVIRONMENT**

*This article deals with the concepts of "multimodality" and "bimodality", their functions in the process of creating a digital educational environment. The terms reflect the innovations taking place in the modern system of education. Multimodality will be considered by us as the mixed transmission of information in digital educational space, which is carried out sequentially in different ways from a "sender" to a "receiver" and is uniform in content.*

*Integration of digital technologies is achieved through the use of multimodal mobile messengers, which are used for the mixed transmission of information. Multimodal mobile messengers are now the regular medium of communication of the digital era and are*

*increasingly being used for the communication between the tutor and students: transmission of material in a form of monologue and/or interactive form, ensuring independence in its mastery; exchange of instant information, notification of the changes in the educational process, etc. The experience of using multimodal Internet tools is necessary in the organization of hybrid learning – a combination of distant and face-to-face learning, taking into account the advantages and disadvantages of both forms: online and offline. Some contact classes are replaced by those online, they may be synchronous or asynchronous.*

*The different regimes used during the training are complementary, and the tutor's strategy is designed to meet the needs of the students and ensure that the course objectives are met.*

**Key words:** *modality, multimodality, bimodality, digital educational environment, media literacy, digital educational space, mobile messengers, hybrid learning.*

**Introduction.** At present the priority for modernization of the education system in Ukraine is its digital transformation, i.e. creation of a digital educational environment that changes not only the structure of education but also the way it is managed. IT-technologies are becoming the foundation of the new educational space that allow to create continuous education and increase its efficiency. The digital environment, designed to incorporate digital technologies into the teaching of foreign languages and to enable their effective use, is not only the set of educational resources that provide the learning process and educational management, but also the transition process to new compact learning formats, mobile, interactive and more efficient than traditional education. The digital environment must constantly evolve, provide time-appropriate advice for the creation of curricula, courses, disciplines, and investigate the opportunities to improve the performance and motivation of students.

**Analysis of relevant research.** The analysis of scientific researches shows that interest in concepts “multimodality” and “bimodality” is constantly growing in digital educational environment. The contribution to the theory and practice of media education has been made by O. Fedorov, V. Ivanov, O. Mokrohuz, O. Voloshenuk in their scientific researches. Implementation of media literacy, digital technologies and media devices in the process of teaching is highlighted by of K. Bahanov, O. Podobed, O. Burim. It is obligatory to mention that the current crisis in education caused by the pandemic requires an urgent change in the traditional education system. We need to adapt to the challenging living conditions, to the digital transformation of education.

**Aim of the study.** The purpose of this article is to investigate the necessary conditions for the formation of media literacy using multimodal mobile messengers in the context of modern educational digital environment that implies the fulfilment of the following tasks: to present and correlate the definitions of the modern concepts of “modality”, “bimodality” and “multimodality” in the process of teaching-learning; to define the options for

the media literacy formation through the use of the most relevant multimodal mobile messengers' functions by describing some transformational phenomena in modern digital education.

**Research Methods.** The research is carried out with the use of the following methods: analysis, synthesis, generalization, classification and content analysis of the available information.

The significant measures have been taken to create a digital educational environment in Ukraine. The newly created platform "Digital Education" (Osvita.diia, 2021) offers educational serials that promote formation of basic digital skills of medialiteracy, online services and online projects. In the development of the software, Edera Online Education Studio was involved with the support of Google Ukraine, Microsoft Ukraine, Academy DTEK, UNDP Ukraine/UNDP in Ukraine, Cisco, FC Consulting, "Osvitoria", Global Tutor Prize Ukraine.

The project "New Ukrainian School" (Mon.gov.ua, 2021) declares creation of the new educational environment, taking into account the changes in the content of education, in the methods of teaching and access to education.

The digital information competence of students is becoming a key skill that "includes the robust and critical use of information and communication technologies for the creation, search, processing, exchange of information at work, in public space and in private communication, providing media literacy, programming frameworks, algorithmic thinking, working with databases; forming skills of secure work in the global net, cybersecurity and understanding of the ethics of work with information (copyright, intellectual property, etc.)".

Due to the emergence of the new educational environment, the process of defining the terms reflecting innovations is of particular importance. The transmission of the terms from one sphere of knowledge to another is constant. For example, the term "multimodality was originally used in the description of transport processes and in the organization of international freight transport. "The carriage of goods in multimodal transport is defined as movements involving at least two modes of transport, with the single transport document as evidence of the conclusion of the contract of carriage and its content. Payment for transport is made according to a single through-tariff scale, and one person is more often responsible for the entire transport of the cargo to the cargo owner. Such a person is called a multimodal transport operator, as this type of transport is still referred to as multimodal" (Yeremeyeva, 2014). In the Short Psychological Dictionary "modality" is defined as one of the main properties of sensations, their qualitative characteristic: color – in sight, tone and timbre – in hearing, character of smell – in smell, etc.

The modal characteristics of sensations, unlike their other characteristics (spatial, temporal, intensive), reflect the properties of reality in a specifically coded form (the length of the light wave is reflected as a color, the frequency of sound waves as a tone, etc.). Modality refers not only to sensations, but also to many other mental processes, describing the qualitative characteristics of cognitive images of any level and complexity. Not only sensations but also perceptions and representations can be classified according to modalities.

In this article, multimodality will be referred to as a mixed transmission of information in the digital educational space, which is carried out in successive different ways from “sender” to “recipient” and is unified in content.

Multimodal mobile messengers, which are now the natural medium of communication of the digital generation, are increasingly being used for the communication between a tutor and students (broadcasting the educational material in a monologue and/or dialogue form, ensuring independence in its development; exchange of instant information, e.g., notifications of changes in the learning process, etc.). However, it should be remembered that digital technologies are not always suitable for all disciplines or all aspects of a particular discipline. Distant learning does not replace the interpersonal contact, which is not limited to the transmission of knowledge only.

Multimodal mobile messengers (Uni-muenster.de/Germanistik/Projekte/WhatsApp, 2021) that allow to create closed group chats include SMS, WhatsApp, Viber, Telegram, Skype, Zoom, etc. All of them, being universally available, provide distant learning in both asynchronous and synchronous mode. In the first case, information is exchanged with students through the ways of communication that do not require simultaneous communication, through discussion forums or exchange of emails, messages, etc. In the second case, the exchange of educational information takes place in real time, “live”, through a chat or a virtual class initiated by the tutor. But in both cases, digital technology provides a reverse (including individual) communication with the tutor and is supposed to continue learning and cooperation apart of real studying-learning process.

In addition, in both asynchronous and synchronous training, rethinking of the structure of the classes should be considered. It is possible to divide them into shorter (15-20 minutes) modules with breaks and elements of individual work, etc.

WhatsApp is a popular free instant text messaging system for mobile and other platforms with voice and video support. It allows to send text messages, images, video, audio, electronic documents and even software installations via the Internet (WhatsApp, 2021).

Group communication in the given network chat creates some foreign language environment, which provides creation of the certain digital educational context with particular goals and methodological tasks. Chat, video chat, file sharing, presentations, work with electronic dictionaries and translators, use of screenshots, text and voice messages, possibility of working on-line are effective foreign language learning tools, that improve the students' performance.

The advantage of a multimodal messenger Viber is the ability to send and instantly receive not only a free text message accompanied by signal but also to exchange photos, videos, files of different types. In a convenient chat interface the tutor can create a group in which you can see the online status of each student. Viber's learning capabilities are constantly being enhanced.

It is mandatory to mention that Skype is a software that provides text, voice and video communication via Internet between computers. The advantage is the ability to make video recordings of examinations and keep them for a long time. A voice chat can be used to establish and conduct a conference call. Using the Skype Smiley Set, the tutor has the opportunity to assess the students' written work or oral answers instantly. Skype gives the opportunity to invite native speakers to on-line classes, to communicate with them, creating "immersio" in foreign language environment. Virtual excursions, work on the project, webinars, Skype lectures allow to solve didactic problems that a tutor faces.

A clear advantage of Skype is its interactive stability – the ability to keep a dialogue or conversation mode with students or a group of students for a long time. Group work with exercises in real time, visual perception of educational material, feedback and possibility of displaying a screen contribute to the formation and further development of foreign communication and information competence. Exchange of photo-files allows to control the quality of performed exercises and to correct them.

Cram (Cram, 2021) as an online tool may be used to organize autonomous learning for students. For example, the web design offered by this service makes it possible to create didactic flash cards for the foreign languages being studied, as well as to use already created ones. To enrich the vocabulary, a student needs to repeat the words placed on the cards multiple times. The words can be repeated in an alphabetical or free order, and on the back of the card there is a synonym for a new word. This online resource also offers the voice sound of the word, accompanied by an English translation.

During virtual (distant) training, it is effective to conduct classes using Zoom platform. It should be noted that for training purposes it is recommended to use up-to-date Zoom Meetings or Zoom Video Webinars. The both platforms, which

are the excellent way to connect, attract large audience, and even collect valuable information by requesting registration, have several major differences. The first platform is designed for active participation and allows participants to use audio and video, share their screens, and create comments and annotations in live interactive environment. When creating a virtual tutorial at Zoom Meetings, the tutor should ask for the access code (create it and share it with the students) and registration (with the possibility of the approval of each registered person by hand). It is possible to disable both the display of the screen, this prevents participants from sharing unwanted or distracted content, and the private chat when it is blocked (prohibiting participants to send personal messages to each other while preserving the possibility of communicating with the tutor). However, when members activate a feature on their device, they can ask questions by raising their hand physically or virtually. In addition, using security icon control, the tutor can restrict the ability of participants to share their screen, chat, comment, and completely exclude an undesirable participant, block or deactivate his/her sound, stop his video, etc. All of the above mentioned options add greatly to the time-management process of on-line teaching and learning.

The second platform allows the organizer to better manage the audience in the following way: instead of video/audio interaction, webinars' participants interact with an organizer and with each other through questions and answers and the chat panel. Thus, Zoom Meetings are useful for the creation of some particular collaborative learning environment in which students interact directly with each other and/or with some shared content. Zoom Video Webinars are well-suited for online lectures (online conferences), where students can listen, view content and ask questions using the question-and-answer function. Undoubtedly, in the teaching of foreign languages, in our opinion it is appropriate to use the first platform (Zoom Meetings).

Zoom can also be used by tutors to record lessons or video clips (fragments) for students (sharing PowerPoint, interactive whiteboard, local or cloud recording, etc.). The option "waiting room" allows to manage the participants by controlling their entrance to the conference. Zoom has the undeniable advantage of providing reliable access to mobile devices, but some functions (such as viewing the gallery) are unavailable or limited on smartphones and tablets. There is a possibility of occurrence of some specific technical problems with Zoom: unplanned disconnection of the microphone; "viral" visitors and errors in the work with complex interface, etc.

According to Andreas Kaplan, director of the Berlin campus ESCP Business School, working groups are to be organized at schools, colleges and universities in

anticipation of the protracted crisis to check the current online courses and review practice in terms of learning tools and, more broadly, the overall strategic positioning while preserving pedagogical continuity in education.

**Results.** Thus the experience of using multimodal Internet tools is necessary in the organization of hybrid learning – a combination of distance and face-to-face learning, taking into account the advantages and disadvantages of both forms: online and offline. Hybrid learning, optimizing the permanence, has to combine face-to-face and online learning. Some contact classes are to be replaced by online ones, which may be synchronous or asynchronous. The different regimes used during the training are complementary, and the tutor's strategy is designed to meet the needs of the trainees and ensure that the course objectives are met.

In some exceptional cases, hybrid learning can also be “bimodal”: the course is conducted simultaneously for a group of students present and for those remote listeners who have to use digital technologies. The tutor conducts the class face-to-face while others follow it on an online platform. In this case, some well-equipped space (interactive television, quality camera, sound recordings, etc.) is necessary. Thus, bimodal training courses synthesize the advantages and disadvantages of face-to-face and distant learning.

The quality of hybrid (including bimodal) education remains a current issue, as the transformation of the course into a hybrid mode requires serious efforts of a tutor (extra time to prepare, to ensure the complementarity of the online and offline classes, coherence and structure of the course, its pace), up to increasing the time frame of interaction with students.

**Conclusions.** Thus, the article describes multimodal mobile messengers used in remote and hybrid (including bimodal) training. It is pointed out that the list of the multimodal tools provided is not finite, as other tools adapted to the specific aims and needs of the trainees can be used in the educational process.

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## РЕЗЮМЕ

**Грудок-Костюшко Марина, Иванова Наталия, Марчук Ирина.**

Мультимодальность и бимодальность в цифровом образовательном пространстве.

*В данной статье рассматриваются понятия «мультимодальность» и «бимодальность», их функции в создании цифровой образовательной среды с целью формирования медиаграмотности. Мультимодальность будет рассматриваться нами как смешанная передача информации в цифровом образовательном пространстве, которая осуществляется последовательно различными способами от «отправителя» к «получателю» и является единой в содержательном наполнении.*

*Интеграция цифровых технологий осуществляется путём использования мультимодальных мобильных мессенджеров, с помощью которых осуществляется смешанная передача информации. Мультимодальные мобильные мессенджеры в настоящее время являются естественной средой коммуникации цифрового поколения и все более активно используются для коммуникации между преподавателем и студентами, изменяя и влияя на методы обучения.*

**Ключевые слова:** *модальность, мультимодальность, бимодальность, цифровая образовательная среда, медиа грамотность, цифровое образовательное пространство, мобильные мессенджеры, гибридное обучение.*

## АНОТАЦІЯ

**Грудок-Костюшко Марина, Иванова Наталія, Марчук Ірина.** Мультимодальність і бімодальність у цифровому освітньому просторі.

*У даній статті розглядаються поняття «мультимодальність» і «бімодальність», їх функції у створенні цифрового освітнього середовища. Фундаментом нового освітнього середовища стають ІТ-технології, що дозволяють створювати безперервну освіту та підвищувати її ефективність. Цифрове середовище, яке повинно забезпечити інтеграцію цифрових технологій у процес навчання іноземним мовам і умови для їх ефективного використання, – це не тільки сукупність освітніх ресурсів, які забезпечують навчальний процес і освітній менеджмент, а й перехід до нових компактних форматів навчання, мобільних, інтерактивних і більш результативних у порівнянні з традиційною освітою. Процес формування термінів показує нововведення, що відбуваються в сучасній освіті. Мультимодальність розглянуто як змішану передачу інформації в цифровому освітньому просторі, яка здійснюється послідовно різними способами від «відправника» до «одержувача» і є єдиною в змістовому наповненні. Інтеграція цифрових технологій здійснюється шляхом використання мультимодальних мобільних месенджерів, за допомогою яких здійснюється змішана передача інформації. Мультимодальні мобільні*

*месенджери в цей час є природним середовищем комунікації цифрового покоління і все більш активно використовуються для комунікації між викладачами та студентами: трансляція навчального матеріалу в монологічній і/або діалогічній формі, що забезпечує самостійність у його освоєнні; обмін миттєвою інформацією, оповіщення про зміни в навчальному процесі тощо. Досвід використання мультимодальних інструментів Інтернету є необхідним під час організації гібридного навчання – поєднання дистанційного і очного навчання, з урахуванням переваг і недоліків обох форм: онлайн і офлайн. Гібридне навчання, оптимізуючи перманентність навчання, складається з очних і онлайн-занять. Деякі аудиторні години замінюються онлайн, які можуть бути синхронними або асинхронними. Різні режими, що використовуються під час навчання, доповнюють один одного, а стратегія навчання продумана викладачем таким чином, щоб задовольнити потреби учнів та забезпечити виконання цілей курсу.*

**Ключові слова:** *модальність, мультимодальність, бімодальність, цифрове освітнє середовище, медіа грамотність, цифровий освітній простір, мобільні месенджери, гібридне навчання.*

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## **ВИХОВНІ МОЖЛИВОСТІ ІГРОВОЇ ДІЯЛЬНОСТІ У ФОРМУВАННІ ДОСВІДУ МОРАЛЬНОЇ ПОВЕДІНКИ ПІДЛІТКІВ**

*Мета статті – з'ясувати виховні можливості ігрової діяльності у формуванні досвіду моральної поведінки підлітків. Методи дослідження: узагальнення, систематизація, порівняння. Результати дослідження: характеристика різних підходів до класифікації ігор, виокремлення відмінних рис ігор, з'ясування функції ігор для формування досвіду моральної поведінки старших підлітків. Практичне значення – визначення ефективності гри у процесі формування досвіду моральної поведінки. Висновки – ігри мають великий виховний потенціал для формування досвіду моральної поведінки старших підлітків. Перспективи – обґрунтування педагогічних умов, які віддзеркалюють ігрову діяльність, для формування досвіду моральної поведінки старших підлітків з метою запобігання і протидії булінгу.*

**Ключові слова:** *гра, ігрова діяльність, виховання, моральна поведінка, підліток.*

**Постановка проблеми.** В Україні громадські очікування від реалізації державної політики в галузі реформування загальної середньої освіти пов'язані не лише з якісним засвоєнням учнями старшої школи навчального матеріалу, але й їх вихованням згідно з моральними принципами нашої культури, традицій, що формуються в складних соціокультурних умовах. Світогляд сучасних підлітків характеризується не лише прогресивними цифровими змінами, а й тенденцією до руйнування багатьох загальнолюдських цінностей, втратою моральних принципів.