

Google Digital Tools for Higher Education: Exploitation, Results, Prospects

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The modern technologies development opens new perspectives for their integration into education. This trend became advantageous after the COVID-19 pandemic especially in terms of the possibilities of cloud services practice. The purpose of the article is to analyze the possibilities, results and prospects of using Google's digital tools in the educational process. Theoretical pedagogical research methods are used in the work. The SWOT-analysis made possible to identify weaknesses and strengths. As a result, the peculiarities of using Google services, their use problems and advantages in the educational process were investigated. Modern military challenges in Ukraine have actualized the problem of distance learning. A model of classes in the student environment using the functionality of Google online services was also developed, its use demonstrated an improvement in the creativity level among students of higher education. To conclude, the use of GoogleMeet, Google Drive and other resources significantly diversify the possibilities of distance learning. The further online education practice only actualizes the necessity of digital elements and their opportunities for training use.

Keywords: high education, Ukraine, distance learning, digitalization, digital tools, Google

INTRODUCTION

Modern labor market trends globalized social changes, and the digitalization of all spheres of human activity have influenced the transformation of the education. This, in turn, has affected changes in approaches and methods of teaching and learning. Virtual, blended learning and education using artificial

intelligence are becoming increasingly relevant (Demiray, 2017). Significant for the development of new education are digital tools that mark the development, quality, speed and attractiveness of information transfer in the learning process. The purpose of the formation of such resources is to facilitate the monitoring of educational outcomes, increase the level of students interest and involvement in the learning process through the use of modern forms, approaches of knowledge acquisition, reproduction, use, and analysis, which in turn makes the education more open and accessible to everyone (Hamzah et al., 2021). Modern digital tools include electronic educational systems, video services, social networks, etc. One of the most common in the educational sector are the educational services of Google system, actively used in both secondary and higher schools. Consequently, the purpose of this article is to analyze the prospects of using Google digital tools. The key objectives of this work are:

1. Analysis of related literature, highlighting previously unresolved, debatable issues;
2. Feature of the role of Google digital tools in the modern educational process;
3. Analysis of Google Meet platform possibilities;
4. Google cloud technologies study;
5. A model of classes with the use of modern digital tools Google development.

The issue of using modern educational resources has been studied by many modern scientists in pedagogy. For example, Hasanov & Cherif (2021) characterized the peculiarities of the introduction of innovative digital technologies in the education system, studied the development and transformation of modern competencies. However, Conte et al. (2019) investigated the problem of the use of educational platforms, identified the particular importance of distance education in the world. Fuad et al. (2020) characterized the key trends in the development of education, problems, and prospects of information and communication technologies implementation in educational field. At the same time, Hamzah et al. (2021) described the problematic aspects of the introduction of distance education, explored the importance of educational portals to support modern continuing education. Tsekhmister et al. (2021) characterized the implementation of distance education in Ukraine. Kornichuk et al. (2021) analyzed the use of modern innovative methods in online or blended education. Sydoruk et al. (2021) identified the main innovative competencies that are important for modern students. Specialists determine that digital competence in today's world is one of the core competencies. Laufer et al (2021) investigated the negative and positive aspects of introducing distance education against the backdrop of the Covid-19 pandemic. However, Kem, D. (2022). characterized the problem of the pandemic impact on the development of digital new education, compared key aspects of the personalized and adaptive learning system. At the same time, Demiray (2017) explored the importance of distance education and the features of its improvement. Parsons et al. (2022) analyzed key points in the process of using modern E-learning platforms. Oliveira et al. (2020) described the key features of the Google Meet system. Meanwhile, Pangaribuan et al. (2022) examined key aspects of using Google Classroom. Uaidullakzy et al. (2022) analyzed the situation of distance education in Kazakhstan and the peculiarities of using the Google Meet platform in Kazakh higher schools. Note that the above experts identified the strengths and weaknesses of this educational platform. Consequently, there are many synthetic works in the modern literature, which widely consider the problem of distance education implementation, so the analysis of using Google servers' features in the future is a relevant topic, given the transformation of education in Ukraine caused by the Russian-Ukrainian war.

MATERIALS AND METHODS

The main empirical materials were the official regulatory documents of the educational sector. In particular, the article is based on the use of standards and recommendations to ensure the quality of higher education in the European space. Of particular importance is the Resolution of the European Parliament on the implementation of the Association Agreement with the EU. Also, empirical materials served as state standards on higher and secondary education in Ukraine, the Law of Ukraine "On Education" and "The Concept of the New Ukrainian School", which noted that digital competence is one of the keys for modern scholars and students. Despite this, it is also important to implement the project "Digital Agenda – 2020", which determines that profound changes in society's digitalization will become real only when the "digital"

transformation will become the main basis of life in Ukrainian society, state institutions and businesses, that is, become a daily phenomenon in the field of education as well.

The article's methodology is based on theoretical pedagogical research methods: analysis, synthesis, induction, and deduction. As a result of the use of analysis the main object of research (educational services Google and their learning opportunities) is divided into smaller parts: analysis of professional literature, research on the effectiveness and problems of using Google cloud technologies in the educational process, the peculiarities of Google learning services in education in Ukraine). One synthesized and combined these elements and got own conclusions and judgments. Based on the concretization method one revealed the problem of implementation of Google capabilities in the higher school of Ukraine is reflected. The work applies the axiological method of research, according to which the education system is interpreted as a set of certain values, so, its analysis allows to reveal the essence and importance of the studied problem through the prism of internal perception and global public response. Based on the systematic method, digital education is treated as a multidisciplinary system consisting of many images. With the help of the predictive method, the prospects of the development of the educational potential of Google were investigated, own hypotheses about the future use of educational services of the Google network were formed.

Among the empirical pedagogical methods, one singled out observation, rating. At the same time, the attention is also paid to the method of SWOT analysis, which has been actively used in various industries since the late twentieth century (Ayoub et al., 2020). The key essence of this method is a thorough, systematic consideration of the factors that are important in making certain decisions. This, in turn, affects the formulation and characterization of the prospects for the development of a particular idea. Consequently, given that this article examines the key digital trends of Google's capabilities the requirement in an objective and thorough study is relevant.

RESULTS AND DISCUSSION

The Possibilities of Google Meet in Modern Education: Prospects and Challenges

Google Meet, compared to other competitors (e.g., Zoom or Microsoft Teams), is an underestimated way to conduct distance learning sessions with students. This platform was finally developed by Google in 2017 based on the then-functioning Hangouts Meet system, a popular app that was used as a paid service for business companies (Oliveira et al., 2020). The functionality of Google Meet made it possible to work through audio and video calls, hold group conferences, and actively manage digital workflows using the capabilities of Google Drive and some other digital programs.

At the beginning of the worldwide pandemic, and in view of the galloping rate of COVID-19, the owners decided that access to the possibilities of using the online platform was free, which generally had a positive impact on the popularity growth of Google Meet, although, in the beginning, its functionality was in some ways worse from the main competitors. For example, the free version of the program initially did not contain a function of video recording, the number of participants was limited to one hundred people, and the possibility of free online meetings did not exceed one hour (Uaidullakzy e The latter characteristic was not a problem, as the Zoom service has only 40 minutes of free time. At the same time, the quantitative limitations created problems for organizing lectures for a large number of people. In addition, there were no possibilities to demonstrate the lecture in a recording.

Undoubtedly, the advantages of Google Meet were also tangible: the ability to hold an unlimited number of meetings, the use of the instant online subtitle function (provided that one has to listen without sound - but only for English speakers), all popular operating systems supported Google Meet, i.e. the platform was really flexible in use. Additional bonuses were a wide palette of video settings, the ability to have a chat between all or several participants, where files or Internet links needed for training could be distributed (Pangaribuan et al., 2022). The corporation's work with privacy settings is also tangible: other participants' microphones cannot be turned on without their permission, recordings and other information in chat are only available to users from the moment they join the event (Tsekhmister et al., 2021). The ability to mute and remove participants already during the video conference was restricted to the administrator of the video session (See Table 1).

TABLE 1
SWOT - ANALYSIS OF STRENGTHS AND WEAKNESSES OF THE GOOGLE MEET PLATFORM

Google Meet	
Pros	Cons
Extended corporate package of services	Time limitation: the session can last up to 1 hour.
Successful integration with other Google services	100 people is the maximum number of conference participants.
Presence of a digital whiteboard, a completely separate platform	Poor sound quality is present in some places
The relative security of use due to the security policy of Google network	When the lesson takes place in a virtual room, it is impossible to record
Sufficiently easy-to-use interface	There is no individual chat (as it is in the Zoom platform).

Concluded by authors.

At the same time, active usage of Google Meet has revealed certain new difficulties in using the service. For example, it is not easy for students from different educational institutions to join the organizer's lecture if it does not belong to his university's domain, and requires additional complicated work with the settings. The problem of using Google Meet while working remotely on mobile devices, especially those that use 3G or 4G Internet networks and support multiple SIM cards, is palpable (Oliveira et al., 2020). Partial service disruptions are also likely, sometimes failing to start or not allowing others to join an online meeting (Pangaribuan et al., 2022; Järvis, Tambovceva, & Virovere, 2021). The pluses when working with the system are indeed greater than the negative challenges, so the popularity of Google Meet will undoubtedly grow. Despite this, there are individual security threats to the Google Meet platform. For example, if an unauthorized person takes possession of a direct link, she could gain direct access to the conference or digital board. Such security threats are generally present in other applications, particularly Zoom, Microsoft Teams (Wedari et al., 2022). Consequently, a weighty innovation for developers should be separate mechanisms to improve without the situation. Despite this drawback, Google Meet still has great potential. (See Table 2).

TABLE 2
SWOT - ANALYSIS OF OPPORTUNITIES AND THREATS OF THE GOOGLE MEET PLATFORM

Google Meet	
Probable possibilities	Threats
Use at the state level	Due to Google's policy, this platform is not available on devices developed by Huawei
Implementation of use based on an educational institution	Through a direct link, access to the digital whiteboard can become public, and this can be used by attackers. (This problem is also present in other applications: Zoom, Microsoft Teams).
Improvement of certain functions (image quality, sound, etc.).	

Concluded by authors

Google Cloud Technologies in the Educational Process

Google Drive is an important and popular cloud technology. This tool allows users to download, create, and process text, tabular documents, and presentations directly in the browser window. With Google Drive, it is possible to store the latest versions of all the files generated on the Web (Oliveira et al., 2020). The

ability to format and edit various text files straight online is extremely important for educational work. Also, the formation of various didactic developments for the educational needs and learning of students can take place based on the use of network services that are available in the menu of work Google Drive, in particular, we are talking about Google documents, the formation of tables, presentations, and drawings. For example, using the Google Docs service, faculty can achieve a variety of purposes: to enhance learning, to check projects and undergraduate papers, to monitor lab work, to review abstracts, and to evaluate the results of the higher education applicants' independent work (Parsons et al., 2022). An important and key advantage of using this application is that documents and tables created by different users are stored on Google servers by default, i.e., access to them is guaranteed from any computer that has an Internet connection. At the same time, access to personal data is well protected and can only be accessed by someone with all the necessary passwords (Pangaribuan et al., 2022). The security factor is often underestimated, but in recent times, the possibility of having constant access to personal information that is also protected from outsiders is extremely relevant (Ali, 2022). Google's security mechanisms are stable, so it is not easy for a third party to gain access to a protected account.

An additional benefit of using cloud computing is the ability to combine and compare different elements without tying them to a rigid computing infrastructure. It is quite realistic that there is a strong case for moving lower-level learning and computing infrastructure to the cloud. The standard programs actively used in the educational process (word processors, spreadsheet editors, graphic editors, email, etc.) will always remain relevant, especially in view of cloud technology (Bondar et al., 2020). The use of Google Drive electronic tools by the teaching departments of Ukrainian universities has greatly simplified the work for the staff. This is especially related to the functions related to administration, in particular the accrual of scholarships, the formation of summary information, lists of students who for various reasons receive education on an individual schedule, information about the stakeholders, etc. (Laufer et al., 2021). The use of Google Drive during distance learning allowed instructors to post all of their instructional materials in the form of electronic teaching and learning collections that contained syllabi, course syllabi, and syllabi with a list of all course work and a hyperlink (Dhawan, 2020; Haidabrus, 2022). All students registered as students in their major had access to the above information.

Of course, the use of these technologies and a number of other innovations associated with the development of modern technology met with resistance from some of the teaching staff. Doubts about the effectiveness of using Google Drive, spreadsheets, etc. were justified by a certain conservatism and superficial perception of the realities of distance learning. At the same time, after all the advantages of the gradual conversion of educational documents into digital form and delayed quarantine measures became apparent, the feedback about the system has improved significantly (Järvis, Kitzmann, & Virovere, 2022). The advantage of using Google's cloud services was the following: teachers adapted and streamlined their own educational materials to meet the demands of today's labor and information markets, and the resources can be accessed from anywhere, which is very important in quarantine and distance work. (Conte et al., 2019). Thus, the use of Google cloud services in the organization of the educational process will indirectly increase the competitiveness and success in the electronic information society and significantly improve and diversify the work of the teacher. On the other hand, it will also contribute to students' creative work, formation of proper conditions for the development of necessary skills and abilities, improvement of assimilation of new received information. Thus, it is generally an element of improving the quality of the educational process as a whole.

Classroom Model Using Google Services

To demonstrate the effectiveness of Google services in organizing student research, one can offer a lesson model that can become typical in the subsequent use of distance education. The familiarization with the tasks, self-organization, and collaborative work of the students took place in the Google Group. The virtual study groups formed during the study are an important factor to improve the educational process because distance education is too individualized - turning to group forms of learning will be an important element in soft skills improving (Lash et al., 2020). Also, using Google Group is effective to organize student project groups, building higher education applicants' self-organization, effective interaction, and

collaboration skills (Aghion et al., 2021; Gumenyuk et al., 2021). After receiving assignments and instructions from instructors, this student group is divided into several smaller microgroups. Each microgroup then independently completes tasks (e.g., working on a virtual lab task) until all students successfully complete the task. Successful completion of the task and successful completion depends on the performance and perseverance of each student microgroup member (Kem, 2022). The social significance of this proposed method of teaching should be particularly emphasized: it accentuates the role of each student, without exception, in the joint performance of a common task. Due to this, collective consciousness is formed, the community is established, and communication skills are improved.

The teacher's work during this process consists of overall coordination, advising, and evaluating the results of the work. Such forms of organizing the educational process require from teachers thorough organizational training: it is important to make all the necessary efforts to build the structure of the student group (to implement the distribution into separate microgroups), to characterize the exact tasks, clearly and timely determine and solve the issues that will appear during the students collective work, etc. Information support allows the learning process to be transparent, dynamic, and effective. Teachers will be able to select the material they need, freely share it with students, advise each student individually or the whole team together, inform them about new tasks, published materials, and learning activities, and give feedback on their work. Google services for this are quite effective tools, greatly simplifying the information support of the educational process.

Conducting control activities can include both a part of joint work and work with additional sources of information, their subsequent analysis, and processing. In addition, preparing the content parts of the control measures requires teachers to understand and take into account various organizational points in detail (Rajab, 2018). In particular, who, when, and in what sequence should demonstrate the results of the work, what is the best way to communicate. This is what online services provide the most options for. For example, it is possible to schedule test events through Google Calendar, to make a file exchange through Google Drive, to send a message instantly through Google Chat.

An organized educational work among students in a virtual learning space is characterized by: construction of a personal learning environment, independent setting (selection) of learning objectives and goals, the need to make decisions on the use of network capabilities, application of management functions on own learning activities. Accordingly, the organized educational virtual work is practically impossible without self-organization and discipline of students, which also affects the intellectual self-development of all subjects of the educational process.

CONCLUSION

Thus, Google's digital tools are promising for further implementation especially as distance education continues to be introduced. Particularly, the Google Meet platform for online lectures has enough advantages related to the protection of information and advanced functionality that allows to effectively conduct classes remotely. At the same time, the use of this software has demonstrated the presence of additional difficulties, which were initially little noticeable. In particular, it is more difficult for students from other universities (whose domain is different from that of the lecturer) to join the lectures, which makes it difficult to form an individual educational trajectory in modern conditions. There is also a problem of using Google Meet on mobile devices, especially when using outdated 3G or 4G Internet networks and on those devices that support several SIM cards at once. Server failures are also possible, which, however, are minor and specific disadvantages, especially when compared to the company's high-quality service.

The use of cloud services, especially Google Drive, in training organization has a significant impact on competitiveness and success. Actually, it has a positive effect on the creativity of student work, improved assimilation of additional information, and, in general, on the growth of the quality of the educational process.

There was also tested lesson model using Google technologies in the process of distance learning. Due to this it was possible to demonstrate the high quality and prospects of using the modern technology. Thanks

to SWOT the weaknesses are also noticeable, but the numerous advantages and further opportunities predominate.

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