COMPARISON OF PLATFORMS USED IN ONLINE EDUCATION

Abstract. In spring 2020, at the beginning of the pandemic, the organisation of education changed overnight. At that time, teachers were planned a short-term solution, but still looking for a reliable platform to connect with their students and deliver quality education. As time passed, they experimented with the platforms that seemed best suited to them and their students, with their advantages and disadvantages. Then, in February of last year, the difficulties encountered forced everyone back to teaching online. The experience of the past has led everyone to return to online education more routinely.

In the research for this study, we looked at platforms that we have tried ourselves. We were looking for those that allowed work with the students not only in the online space but also in the creation and sharing of e-tests. Our aim was to select and test four platforms (Google Classroom, Microsoft Teams, OnlineTestPad and EduBase) for the organization of lessons and to compare them.

In this paper, we present and compare these platforms on the basis of the aspects we consider important from an educational point of view. As the most prominent aspects, we have examined the ease of use of the interfaces found, such as registration and group creation. From an educational point of view, the possibilities of video calling and group and individual messaging were considered important. We also looked at the setup features, the editing of e-tests, and the online and offline distribution options. We highlight the advantages and disadvantages of the platforms.

Another aim of the study was to use the comparison to help trainers find the most appropriate tool for organising online teaching and learning. We show the way
towards a platform that will make it easier for the instructor to keep in touch with
his students, and that will save time in measuring students' knowledge by making it
easier to edit and distribute e-tests.

Keywords: organization of education, online platforms, e-test.

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ПОРІВНЯННЯ ПЛАТФОРМ, ЩО ВИКОРИСТОВУЮТЬСЯ В
ОНЛАЙН-ОСВІТІ

Анотація. Навесні 2020 року, на початку пандемії, організація освіти
zmінилася за одну ніч. На той час вчителі планували короткострокове рішення,
ale все ще шукали надійну платформу для зв’язку зі своїми учнями та надання
якісної освіти. З часом вони експериментували з платформами, які, на їхню
dумку, найкраще підходили їм та їхнім учням, з їхніми перевагами та
недоліками. У лютому минулого року, труднощі, з якими вони зіткнулися,
змусили всіх повернутися до викладання онлайн. Попередній досвід показав,
що варто вчителям повернутися до рутинного онлайн навчання.

При підготовці цього дослідження ми звернули увагу на платформи, які
випробували самі. Ми шукали ті, які дозволяли працювати зі студентами не
лише в онлайн-просторі, а й створювати та надсилати електронні тести.
Нашою метою було обрати та протестувати чотири платформи (Google
Classroom, Microsoft Teams, OnlineTestPad та EduBase) для організації уроків
та порівняти їх.

У цій статті ми представляемо і порівнюємо ці платформи на основі
аспектів, які ми вважаємо важливими з освітньої точки зору. В якості найбільш
важливих аспектів ми розглянули простоту використання знайдених
інтерфейсів, таких як реєстрація та створення груп. З освітньої точки зору,
важливими були можливості відеодзвінків, групових та індивідуальних
повідомлень. Ми також розглянули функції налаштування, редагування
eлектронних тестів, а також варіанти надсилати їх онлайн і офлайн форм. Ми
виділили переваги та недоліки платформ.

Ще одна мета досліджень - за допомогою порівняння допомогти
тренерам знайти найбільш підходящий інструмент для організації онлайн-
викладання та навчання. Ми показуємо шляхи до платформи, яка полегшить
викладачеві підтримку зв’язку зі своїми студентами, а також заощадить час на

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Introduction. Organising education is the cornerstone of being a teacher. From state-defined programs to curricula and working methods, they are part of everyday life, as we prepare for lessons day by day, setting goals and the competences we want to develop at a given time. All this remains fundamentally the same in times of crisis, but significant changes need to be created if classroom work is to be shifted to distance learning and online spaces.

In overcame the lack of tools, teachers have encountered problems with how to organise their students into groups in the online space, and what interface to work on, so that it is easy enough for students and teachers alike to navigate. This did not go smoothly as both teachers and students had different competences in using the computer.

Literature review. If we talk about education, and within this, about educational governance, we must use the results of the modern sociology of education. Education is part of social processes, and society is seen as a set of giant systems and subsystems [9]. In the words of János Tímár, educational planning "requires a time horizon of fifteen to twenty years to plan the functions of education and the process of education, the structure of the school system and the schooling of the population. The three distinctly different models of education are those based on workforce approach, cost-benefit analysis, and social demand" [3].

Education was a social activity for many centuries before the 19th century, but it did not cover everyone (there was no mass education), and education was not organised in the way it is today [9].

In Kotschy's research we find a quotation from a dictionary article on instructional planning: „the activity of preparing instruction in a planned way, in which the planner determines the aims of instruction, the content to be taught, the requirements, the teaching-learning strategy, the methods and tools, the methods and tools of control and assessment, with a view to motivating, differentiating and activating. This activity falls within the professional competence of the teacher, who takes into account the information he or she has acquired about the pupils, the teaching conditions and his or her previous professional experience. The source of systemic planning is the central curriculum. The local curriculum is the element of content regulation at institutional level. It can be based on (1) the precise and specific formulation of objectives, (2) the content of education and its didactic, logical and psychological analysis, (3) the system of requirements laid down in the national curriculum, and (4) the definition of pupil-teacher activities. In pedagogical practice,
plans may be drawn up for a specific period of time, such as the curriculum and lesson plan, or for the acquisition of a specific unit of content, such as thematic plans and project plans. The relationship between planners and users can vary during the process of making plans. In the rational model of planning, professionals make the plans based on precise algorithms, and users only have a role in implementation” [3].

In order to have information about e-learning that goes beyond generalities and facilitates understanding, interpretation and use, we need a more detailed definition of the concept. One possible approach is to enumerate the different forms of e-learning [2]. Based on Fazekas' research, the following types of e-learning are defined:

- **Learner-led**: learners work through the pre-prepared learning material at their own pace, without any assistance from the instructor.

- **Facilitated**: the learner is provided with opportunities for collaboration. This type is useful where the learner is left to work at his/her own pace, but is given the opportunity to take advantage of opportunities for discussion and discussion with other learners or the teacher.

- **Teacher-led**: This type of e-learning uses web technology to supplement or replace traditional distance learning methods with e-learning using the same content and methodology. This type of training usually uses real-time communication technologies such as video and audio conferencing, chat, screen or application sharing, whiteboarding, traditional telephone conversations.

- **Embedded e-learning**: the possibility of just-in-time instruction: instruction (or assistance) embedded in a computer program. This is used when the user needs to learn the material immediately [1].

Developments, programs, and learning materials, which can be summarised as e-learning, are forms of learning organisation, learning management and learning support that draw from three well-defined sources: computer-assisted learning, online learning and distance learning [2].

Computer Based Learning (CBL) means organising the learning process around the use of a computer. It is the latest version of the earlier use of technology-based learning, in which the multimedia, interactive computer appears as the central teaching-learning medium [2].

Internet-based, web-based learning is a new possibility and a new horizon with computers connected to the World Wide Web. With the help of a networked computer we can virtually step out of the concrete learning environment. The new dimension is primarily represented by the network of databases providing a virtually arbitrary amount of information for learning and the manifold and varied possibilities of electronic telecommunication [2].

Distance learning emerged in the 18th century as an alternative to traditional education, as a form of education, teaching and learning that could be conceived and implemented in other ways. One of the oldest institutions to use distance education is the University of South Africa, which launched its first distance education course
in 1946. Initially, the main tool was the letter, which was used to deliver written material to students. Later, also using traditional postal services, images, audio and video were also transmitted [1].

Distance education is a new paradigm, which has moved away from the framework of face-to-face education of previous social formations, and implies a change in the demands on the teacher and the learner [2]. Saykılı's research has collected the main elements of Keegan's definition of distance education:

- the separation of teacher and learner, which distinguishes it from face-to-face lectures;
- the influence of an educational organisation, which distinguishes it from private learning;
- the use of technical media, usually printed, to bring teacher and learner together and to carry the educational content of the course;
- providing two-way communication to enable the student to benefit from or even initiate the dialogue;
- the possibility of occasional meetings for both didactic and socialisation purposes;
- participation in an industrialised form of education [8].

The purpose of the article is to study which of the platforms tested is the most helpful for teachers and the easiest to reach students and assess their knowledge.

Methodology. We examined several different platforms, looking for the aspects we considered most important: the organisation of the class and students, the ease of use of the platform and the creation of an e-test. Among these, we would like to highlight the activities we would recommend to teachers, in preference to which one.

Research results. At the start of the pandemic, a sudden change meant that a suitable platform for organising education had to be found. Regardless of the subject, the problem of how to do the best quality work in the online space had to be solved. The management of the institutions also worked to find standardised, easy-to-use and effective platforms for their staff to work on. A comparison of the platforms we have studied, shown with their logos in Figure 1, is presented in this study without claiming to be exhaustive.

Fig. 1. Logos representing the platforms ([6], [7], [5], [4])
Google Classroom is a free blended learning platform developed by Google for educational institutions to simplify the creation, distribution and grading of assignments. Google Classroom's primary goal is to simplify the sharing of files between teachers and students. It was made publicly available on 12 August 2014, and by 2021, approximately 150 million users were using Google Classroom. Google Classroom integrates several Google Applications for Education, such as Google Drive, Google Docs, Google Sheets, Google Slides, Google Forms, Google Sites, and Gmail. Students can be invited to classrooms through the institution's database, through a private code that can then be added in the student's user interface, or automatically imported from a school domain. Each class created with Google Classroom creates a separate folder in the respective user's Google Drive, where the student can submit work to be graded by a teacher. Google Classroom turned in assignments can be graded by teachers and returned with comments before the final submission, allowing for the students to modify their work. Once turned in, assignments can only be edited by the teacher [6].

Microsoft Teams is a proprietary business communication platform developed by Microsoft as part of the Microsoft 365 family of products, first released on 14 March 2017, with approximately 270 million monthly users in 2022. Teams allows users to communicate in two-way persistent chats with one or multiple participants. Participants can message using text, emojis, stickers and gifs, as well as sharing links and files. In August 2022, the chat feature was updated for "chat with yourself"; allowing for the organization of files, notes, comments, images, and videos within a private chat tab. Channels allow team members to communicate without the use of email or group SMS (texting). Users can reply to posts with text, images, GIFs, and image macros. Direct messages send private messages to designated users rather than the entire channel. Meetings can be scheduled with multiple participants able to share audio, video, chat and presented content with all participants. Multiple users can connect via a meeting link [7].

EduBase.net is an educational website and platform that aims to introduce the concept of collaborative education to the Hungarian internet world through video-based learning materials. The service was created by three students in 2013 and opened to the public on 9 March 2014. The website currently provides a great deal of support to university students, mainly in mathematics and computer science. Through the website, you can directly access more than 1,100 Hungarian-language audio-visual lectures free of charge, all of which are uploaded to YouTube [5].

Online Test Pad is a Free multifunctional service for testing and training. It is designed for easy editing and assigning of educational tasks (tests, crosswords) within and outside of classes and lessons created on the platform. For greater usability, 3 types of test can be created: Psychological test, Personality test and Educational test. The educational test. The educational test summarizes the number
of points for correct answers, determines the percentage of the maximum score, and sets the mark. The test editor can select from 17 item types to choose the task that best suits the topic and the students' needs. The interface adapts to any screen size. Tests can be conveniently completed on PCs, tablets and mobile devices [4].

Table 1 presents a comparison of the four platforms, their advantages and disadvantages, based on the main aspects collected for the organisation and delivery of education.

### Table 1

<table>
<thead>
<tr>
<th>Viewpoint</th>
<th>Google Classroom</th>
<th>Microsoft Teams</th>
<th>EduBase</th>
<th>OnlineTestPad</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registration</td>
<td>Google Account</td>
<td>Microsoft 365</td>
<td>Google Account</td>
<td>Google Account</td>
</tr>
<tr>
<td>Create a group</td>
<td>Classrooms for each different group</td>
<td>Groups, and channel as needed</td>
<td>Different groups</td>
<td>Create a &quot;Lesson&quot; group</td>
</tr>
<tr>
<td>Invitation to the group</td>
<td>By sending an invitation letter, link or class code</td>
<td>By sending an invitation letter or link, by grouping registered or guest users</td>
<td>Invitation or link to a posted test</td>
<td>By sending a link</td>
</tr>
<tr>
<td>Video call</td>
<td>Google Meet</td>
<td>Google Form</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Messages</td>
<td>Group, private or e-mail</td>
<td>Group and private</td>
<td>Individual or e-mail</td>
<td>None</td>
</tr>
<tr>
<td>Edit test</td>
<td>Google Form</td>
<td>Google Form</td>
<td>EduBase Quiz</td>
<td>OnlineTestPad Tests</td>
</tr>
<tr>
<td>Test questions</td>
<td>Individual</td>
<td>Individual</td>
<td>Egyéni és kérdésbankból</td>
<td>Individual</td>
</tr>
<tr>
<td>Mathematics formulas</td>
<td>Not managed</td>
<td>Not managed</td>
<td>LaTex based</td>
<td>LaTex based</td>
</tr>
<tr>
<td>Send a test</td>
<td>Depending on the setting, anyone with a link can fill in</td>
<td>Depending on the setting, anyone with a link can fill in</td>
<td>To EduBase group or by importing to external</td>
<td>Anyone with a link can fill it without assigning it to a group</td>
</tr>
<tr>
<td>Test in offline mode</td>
<td>Print to pdf (task only)</td>
<td>Print to pdf (task only)</td>
<td>Impossible</td>
<td>Download to pdf (task and/or answer key)</td>
</tr>
<tr>
<td>Timeout</td>
<td>Yes for tasks, for e-tests only manual disable to receive answer</td>
<td>Yes for tasks, for e-tests only manual disable to receive answer</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
While each of these platforms can be used to create groups, we believe that Google Classroom and Microsoft Teams are the most suitable, and that's why we've highlighted them. In both cases, it is possible to download the program/application to a computer and mobile phone, as well as assign and control tasks individually, and communicate online using the built-in video call feature. Based on our own findings, we found Microsoft Teams to be more practical.

For the creation of e-tests, we prefer the EduBase and OnlineTestPad platforms, which are also suitable for LaTex-based maths editing. EduBase is most helpful in mathematics. In addition to these, it offers the advantages of being able to select exercises from the test bank by topic and transpose them into your own test, as well as practice exercises and graduation exercises. When creating individual items, we can also apply parameters that change within the specified intervals after each opening. The disadvantage is that editing the formulas requires manual input, knowledge of the commands, and export for assignment outside the test interface, which is only valid until a certain date. A further disadvantage is that the user is deleted after an unspecified period of inactivity, which means that all groups and e-tests created up to that point are lost. A reminder letter is sent 2 weeks before deletion to delete the account. Advantages include a Hungarian language platform and settings to create limits that ensure cleaner work by students.

An advantage of OnlineTestPad as an e-test editing platform is that, when editing maths, we can edit LaTex-based formulas in a dialog box by selecting from menus. In addition, the site can be used to create Sudoku, and less mathematical crosswords. The test editor can be used to edit additional items rarely used in mathematics like matching, fill in blank fields or choose from list, file upload or to accommodate larger texts or audio recordings. As a drawback, that the interface is available in a few languages and can only translate the main menu items in most of them, but the input language can be any language, and accented letters are displayed without error. The advantage is that the generated hyperlink can be used to submit a prepared test or other assignment anywhere without creating a group, and anyone can complete it if the e-test is open. In addition to the online distribution, the completed test can be downloaded in pdf format and distributed in printed or delayed form. The pdf can also be generated in the form of a solution key if we want to see it with the correct solutions.
Both of test maker platforms have options to set limits to ensure that the students' own work is done. These include setting a time limit, disabling copying of the task text, and allowing a student to complete the test only once. The latter is restricted by the OnlineTestPad interface by checking the IP address of the computer, which can be a problem if the devices on which the test is taken are connected to the same wireless internet. In this case, the IP addresses are the same, so only the first user to log in will see the exercises, the other students will receive an error message.

Other similarities between the two platforms include the fact that both allow manual checks and sub-scoring of tests. The advantage of OnlineTestPad is that it does not distinguish between small and capital letters for text, and for items where a number needs to be entered, the allowed rounding error can be set, so there are fewer manually corrected tasks. The results are available for download in both cases. EduBase collects them in a logbook, while OnlineTestPad collects them in an Excel spreadsheet. The results are also displayed in the form of a diagram for students who have completed the test. Depending on the setting, they can also see the correct answers next to their own answers after completing the test.

For editing, sending and correcting tests, we find the OnlineTestPad interface more user-friendly, despite the fact that EduBase offers more options for math tests.

**Conclusions.** Online learning organisation often presents us with challenges in our daily lives, both in the presence and in the course of online learning. From the e-learning learning modalities, distance learning has been used as a modern educational organisation. The first challenge was to connect online, where we tried to transfer traditional classroom work into an online space. To assign and grade tasks and achieve educational objectives, everyone chooses the platform that suits them best.

After doing our research and looking at these platforms, we believe that Microsoft Teams is the most practical platform for organising classes and groups, and for sending and grading tasks. For editing tests, although both platforms presented have many advantages, we found OnlineTestPad to be a more user-friendly platform due to its ability to assign tests and its ease of use across multiple subjects.

The crisis situations are not over yet, so we continue to use groups and knowledge measuring e-tests in traditional, hybrid and homeschooling education settings, according to individual goals.

**References:**


