Handbook prepared by: Milan Petrović and Deniz Hoti Consultant: Olivera Todorović

Project Based Learning and Distance Learning Handbook

Contents

Introduction

This handbook has been a result of cooperation and experience of educators working in the formal education system, educational policy innovators and representatives of the non-governmental sector, who have been introducing innovations in education for years. It was developed within the "Public-Private Dialogue for Development" project, implemented by NALED in cooperation with the Public Policy Secretariat, and supported by the United States Agency for International Development (USAID). The handbook was written during the crisis caused by the Corona virus, which explains the authors' focus on digital tools, and their intention to put emphasis on those that are user-friendly and freely accessible. In the handbook, we will provide advice as much as practically possible on **how to start, organize and evaluate project-based learning** but will also briefly describe the advantages of this form of teaching. We hope that this short theoretical introduction will adequately explain why project-based learning is worth trying in classroom, as well as in distance teaching.

The history of the development of formal education has closely followed the industrial and, more recently, the technological revolutions. The second Industrial Revolution, also known as the Technological Revolution, which is dated between the middle of the 19th century and the first decade of the 20th century, in addition to electricity, telephones and telegraphs, brought mandatory primary and improved secondary education. However, *the education system was always created in accordance with the time and the needs of the industry of a particular time*. Thus, the second Industrial Revolution also strived to create an exemplary citizen, but above all a lane worker. This in itself did not constitute evil, because the basic goals of education were and remained the same: young people should be given the knowledge and skills necessary for life and work; they should be helped to succeed and be active members of society. The question is: **does the education system that was adapted to that time and the needs of such a labor market still meet the needs of individuals living in the modern, digital age and being educated, not for the third, but for the fourth Industrial Revolution?**

The future brings general connectivity, smart cars, artificial intelligence and YES - teleworking. How can we help our students (and why not all of us) prepare for the world in which they will work and live? APEC (Asia-Pacific Economic Cooperation) and OECD (Organization for Economic Cooperation and Development) have agreed on what skills comprise **the 21st century skills**. Economic experts have predicted the following abilities as a prerequisite for success in this century:

- **learning and improving the so-called 4C**: critical thinking and problem solving, creativity and innovation, communication and cooperation (*critical thinking, communication, collaboration and creativity*);
- **digital, media and information literacy** (usually abbreviated DMI - *digital, media and information literacy* or MIL - *media, information literacy* as defined by UNESCO);

- **career and life skills**: flexibility, adaptability, initiative and proactivity, social and intercultural interaction, productivity, responsibility, leadership and social responsibility.

To what extent are we prepared to teach these skills in Serbia? Do we have curricula and all the necessary legislation that allows us to adapt the teaching process to the new needs of students? Are we sufficiently educated for something like this? Have we been taught about this and in this way at the university? All these questions are more than reasonable to ask and we can pose them to decision-makers but also to ourselves!

There are [studies](#) that show that by 2030, between 400 and 800 million workers worldwide will lose their jobs due to the accelerated digitalization and automation of various occupations. On the other hand, the same artificial intelligence and machine learning technology will create new jobs that we can but imagine today. A change for which no government in the world is completely ready is about to come, but one thing is for sure - it must start with a change in the outdated education system.

Where are we in all this? Progress at the level of educational policies still exists, and not a small one! The Ministry of Education, Science and Technological Development has adopted the *[Strategy of Education Development in the Republic of Serbia until 2020,](#)* which harmonizes the educational policy of our country with the educational policies of the EU. In 2019, the Institute for the Improvement of Education adopted the *[Digital Competence Framework,](#)* which defines the competence teachers need for the digital age. The Social Inclusion and Poverty Reduction Unit, in cooperation with the United Nations in Serbia, has seriously dealt with the [transformation of education](#) in Serbia.

What can we, as teachers, change in our classrooms? **The handbook in your hands is intended for those who have decided to not wait, to take responsibility, for those who do not look for excuses, but solutions.**

[Bloom's taxonomy of educational goals](#) is well known: the basis of the pyramid is made of facts and concepts that we expect students to remember, it is followed by understanding and application, and at the top are the analysis and evaluation of the learned material. **At the very top is *creation*** - the ability to use all the previous stages in learning and create something completely new. If we look again at the already mentioned *21st century skills,* we will easily see that they are all contained in the tasks that require students to create something new. It is necessary for them to communicate, digital tools are imperative (which, by the way, are often free, and always available to them), but above all, it is a form of work in which they are expected to think critically and evaluate, connect and innovate.

Many creative teachers already apply the project-based learning method. Examples of their work are the best proof that Serbian education has nothing to be ashamed of in terms of modern approaches to learning. We are grateful to them for their enthusiasm, professionalism and courage to accept such a challenge. The Corona virus locked both us and the students in their homes and practically forced us to rapidly digitize the educational process. The impression is that many have coped as best as they can, but the approach to teaching has usually not changed: frontal instruction and, at best, the dialogical method of working with students, are those that predominate. **Project-based learning carries a real**

paradigm shift and that is what we wanted to address most closely in this handbook.

We tried to be practical, to anticipate challenges and respond to those that project-based learning will cause to teachers and students, to point to the appropriate tools to facilitate and support change in the perspective and way of working by means of best practices. In addition to tools that you can easily and free of charge try with your students, we have made an effort to present some resources that can be useful to you as additional content for conducting classes. We hope that this handbook will represent a professional challenge for you, but also an aid to make the best use of the benefits of project-based learning. We would like you to take what you consider valuable in the handbook with you to the classroom, be it in the school building or online.

What is project-based learning and what is distance learning?

In the circumstances in which the entire system of education, and it might be said, society as a whole, was rapidly digitized, so many new ideas appeared in the public sphere, that there is a real danger that some important theoretical settings will be confused. The two terms that we most often encounter when talking about methodological models for the organization of teaching are **project-based learning** and **distance learning**. Although in this period both models will appear and be applied in parallel according to the situation, it is still important to understand what each of them means.

Distance learning is actually a very old concept. The first successful attempts marked the middle of the nineteenth century and were based on the fact that students, who for some reason were prevented from physically attending classes, received learning materials by mail once a week. Universities embraced this model of learning very quickly and in just a few decades the diplomas of famous universities became more accessible than ever, even to those who did not have the money for conventional studies. However, distance learning experienced a real renaissance with the advent of the Internet. The terms e-learning, online teaching, virtual classroom, webinar, MOOC (MOOC - *massive open online course*) have quickly flooded the network and today few world universities that care about their reputation do not enable online studies. In short, we owe a real revolution to this concept in terms of open access to knowledge.

Methodologically speaking, distance learning requires student motivation, which in this case usually exists. Classroom management is replaced by independent organization of time for work and study, and the focus is on researching literature and available materials. Classes can be organized quite *asynchronously*, which is usually the case with MOOCs, so that students do not have to work at the same time, but when it suits them. Occasionally, *synchronous teaching* is used, in the form of online consultations or meetings through existing applications for communication over the Internet. After a certain period or after a certain part of the material, the student is tested (which is always a special challenge in this model) and based on the test results a grade is assigned to the student, also remotely.

The good sides of distance learning are certainly the reduction of teaching costs, insisting on the responsibilities of students and great availability in situations such as those that by nature require physical distance. However, that model includes the problems and challenges that the teaching conceived for the 19th century cannot resolve. First of all, learning is still perceived as a "rote learning" and then a reproduction of facts; the knowledge taught is almost entirely theoretical, and learning is closely connected with preparation for testing.

Project-based learning, created at the end of the 19th century under the influence of Piaget's research in the field of developmental psychology, is based on the idea that an individual constructs knowledge on the basis of experience. Unlike the standard classroom to which we are accustomed and in which most of us were educated, the "classroom" in which project-based learning is conducted is student-oriented, provides both space and context in which to collaborate and explore problems and challenges from the world around students. It is a completely different approach to learning, because, instead of conveying facts, the processes of research, questioning and active cooperation are favored in order to solve a challenge or problem.

In our country, concepts such as *experiment-based learning* or *problem-based learning* may not be common, although they are very similar to project-based learning. But even though you have never had the opportunity to experience this approach, you have certainly seen and sighed for modern schools where students walk around freely organized spaces and have the most modern equipment they use for various projects. Before you conclude too quickly that such a thing is not possible with us, remember that modern technology has made many things possible and put in the hands of almost every student a computer far more powerful than the one that successfully sent people to the moon.

It is true that project-based learning is no longer a matter of the future, but a practical reality in many classrooms around the world and increasingly so in our country. Using online communication tools, such as Viber, Skype or Zoom, although a good step in the right direction when it comes to distance learning, is not in itself project-based learning, but just that - distance learning. Project-based learning is something that now, more than ever, you have the opportunity to try, and it will certainly be easier for you to continue to use it as a very effective approach even when you return to the classrooms - it is a paradigm shift that we hope for and want to encourage you to pursue.

Gold standard of project based learning

While project-based learning is student-oriented, teachers have a key role to play in the education process. They are the catalyst without which even the most equipped classroom will remain just a beautiful space without any connection with learning, and vice versa, they are the ones who can revive even the most meager conditions and turn them into an ideal context for the most perfect learning.

Gold Standard PBL

Seven Essential Project Design Elements

The Gold Standard is a graphical representation of the principles and goals of project-based learning and can serve as a guide in planning, performing and evaluating the results of work with students. The outer circle is made up of seven elements that we combine to achieve three important learning goals:

- transfer of key concepts
- understanding and
- success skills

Project based learning begins with a question or task. A meaningful and realistic problem or question that corresponds to the level of knowledge and maturity of students is the framework of the teaching unit in project based learning. From there, the teacher guides students through a process in which they ask questions, look for materials and review information, and use those that are reliable. It is important to note that the class will be better the more it focuses on solving real problems, the use of specific tools and skills, that is, if the questions are current and important to students. Students are the ones who "talk more" and make decisions about how they will work and get the results of project based learning. The teacher is there to participate in the reflection together with them, to help them assess the effectiveness of each individual activity and, if they encounter some insurmountable problems, to offer possible solutions or strategies that would help them overcome these problems. This process teaches them how to accept criticism, to adopt it and improve their work process and reach better results. The key element of project based learning is when it takes place outside the classroom! The results of project based learning with students must be turned into a public event, where they will present, explain and thus share them with

9

other teachers and students, parents or the wider local community.

The goal of this approach to learning is not only the transfer of knowledge, which will certainly happen, but additional benefits that are invaluable for students:

- students enjoy the learning process, are motivated and present,
- the focus shifts to the learning process and students are no longer solely motivated by grades, but also by a sense of personal achievement,
- increased understanding and improved ability to apply learned material,
- knowledge relating to different subjects is often linked during solving real problems,
- developed critical thinking, communication and teamwork,
- students become more self-aware, responsible and learn how to organize themselves,
- students master the skills of presentation, public speaking, overcome anxiety while presenting the results of their work.

Does the result of the project based learning have to be public?

In short – it is a must! Not only is the public presentation of the results a key part that forms the core of the concept of project based learning, but it is also pedagogically justified and logical. First of all, think: the students put a lot of effort and creative effort to achieve results in solving a real problem. Now that they have a tangible result, of which they are always, and rightly, proud of, should that result be hidden?

Let's try to explain it like this: you gave them tasks to make poster presentations. What do you think, will they try harder if you tell them that they will present it for five minutes in the next class, in the class they worked on the poster with, or if you announce that you will:

a) invite students from another class to listen to the presentation,

b) invite colleagues who teach another subject related to the topic of the presentation,

c) publicly post them on the walls of the school hall and make a short presentation to interested students during recess or

d) invite parents to socialize during which time students will give a presentation of their work

A public event, as part of the whole concept, is an element that will make both your efforts and the efforts of students more serious (this is probably the reason why many give up on this approach too early). On the other hand, you know your students best as well as their abilities, so you will certainly not put them in a situation where they cannot master something even with your help. So, it is about setting a goal together with a *good measure* and working as a team because you are together in it until the end. A valuable result of this element will be the achievement of specific educational outcomes, to which you rarely have the opportunity to devote yourself sufficiently.

Repeat the process, do not repeat the result?

By now, someone has probably already figured out the old student strategies so often prevalent in our formal education system.

How do we know that students will not work on the same project or copy the same result from year to year?

They will not do so, because you as a teacher will not allow it. The focus is on the *learning process*, not on the results of project based learning. It is much more important what questions you ask them, how you guide them through the creative process, what resources they come across and how you interpret and use them together. There is one trap that teachers often fall into: as soon as you start offering them resources, solutions, ideas - they return to the comfort zone, accept your ideas as the best ones and you have already run into the problem of copying. If they themselves come across the same sources as, for example, the second group or the previous generation, you are the one who will ask the question *how this can be improved and stop* the cycle of copying at the beginning. There are no quick fixes - both the process and the result of project based learning cannot be achieved in one to two school classes. Plan your activities well, give yourself and them time and don't rush to results. If the **process is** well set up, it rewards both the student and you at every step of the way, even before you get results and nothing is lost.

The difference between projects and project based learning

The content of this handbook was created as a combination of experiences gained in the school classroom and by different organizations that deal with education within the non-governmental sector. The authors believe that the cooperation of different sectors, as well as the combination of experiences in order to achieve the best results in learning, is a long-awaited change, if not the only possible one that will motivate us to move forward. "Connecting", an organization from Pancevo, made a [film](#) titled "Education for 4.0 Revolution", which illustrates the need for a new approach and proposes project based learning as a model for the future. "Nauči me" (Teach me), an organization from Nis, three years ago opened "[Unbox hub of innovative education](#)" for students to freely work and learn in a different way through courses, clubs and open lectures.

Among many other initiatives, we emphasize efforts made by the Government of the Republic of Serbia, as it adopted the new [Law on Primary Education](#) and the Rulebook on Curricula within the curricular reform that began in 2017. Primary and secondary schools today in their curricula focus on learning outcomes and competency development, rather than on testing and repetitive knowledge. [Project based learning](#) has been recognized by educators in Serbia as an extremely effective teaching method that can contribute to preparing students for life in the 21st century.

In this regard, we emphasize the rapid reaction of the Institute for the Improvement of

Education, which in the previous two years joined the education reform with its "Training for the implementation of new outcome-oriented curricula", prepared in cooperation with the Ministry of Education, Science and Technological Development, as well as its online training "Project based learning" prepared in cooperation with UNICEF.

These are not the only best practices and you will find many more in this handbook, but they are adequate evidence of the enormous capacity our teachers have, as well as the reach we can achieve by applying project based learning methods. However, it is worth explaining at this point, before we move on to the organization of project based learning and its implementation at a distance, what is the difference between the project and project based learning.

The project has its beginning, sequence of activities within a timeline, it has its author or the whole team of experts, it uses resources and knowledge to produce the expected, measurable results. When NGOs, IT or other companies plan activities, develop programs or apply for funding from donors, they also start with an idea and then use appropriate formats to put the project proposal in writing in the form of a written plan.

In our classrooms in Serbia, projects appear relatively often, most often as a method intended to get students going. Any teacher who has given a task to a student or a small group to make a presentation or a poster, prepare a sketch or collect a herbarium can claim to have been part of student projects. Although reminiscent of project based learning, these examples are not really project based learning in the true sense of the word.

Project based learning is a specific approach, not a result that a student or group has reached by working according to clear and pre-agreed instructions from the teacher. In this process, students are encouraged to do research, discuss, evaluate, work and create, and the end result is not defined in advance, especially not by teachers. The students plan the result and present what they generated with their research and work to the wider community, outside the narrow circle of the class in which they worked. The table below lists some important differences between projects and project based learning.

Tabular presentation of the characteristics of projects in education and project based learning

Project	Project based learning
Project is a supplement to a lesson or lecture.	Project based learning as an approach is a lesson in itself.

The task relies strictly on the teacher's instructions.	The task is open-ended and the focus is to hear the voice and respect the choice of each student.
Such tasks are repeated from year to year.	Even when the initial task is the same, neither the learning process nor the result is ever repeated.
Individual work or work in groups.	The whole class (or even several classes) works as one team.
Independent work within narrow constraints defined in advance by the teacher; most often work at home, out of class.	The work involves only the advice of the teacher, while the real leadership remains with the students. It is performed in school during class or outside school, in nature or, according to the needs of the project, in cooperation with an organization or local company.
The focus is on the product that the student should achieve as a result and only that is evaluated.	Project based learning means constant guidance and a learning process that is valued as much as the development that led to the end result.

Note: None of the above characteristics in themselves make an activity belong exclusively to a project in education or project based learning. On the contrary, it is a set of characteristics, so it is necessary that all these conditions, at least to a certain extent, be met in order to be able to talk about project based learning as an approach to teaching.

Preparation for the implementation of project based learning

Every experienced educator knows that successful preparation is a sure path to success. Project based learning as an approach does not differ in that: the teacher should and must prepare for the class because, although he will largely leave the leadership role to the students, his responsibility is, after all, to lead and direct the whole process. The question is how to create a system in which all students are invited to express their individuality. How do we make them feel invited to share their ideas or think about a problem? Classrooms with a constant focus on grading and assessment are not a place where you can easily find a student who is ready to "say something stupid" (according to some studies, one of the biggest fears among young people is that they will come across as "stupid in class"). The

history of innovation has shown countless times that something that seemed like nonsense was actually the initial trigger for a whole new idea. Finally, the success of project based learning largely depends on the motivation of students, and a good teacher will be able not only to arouse curiosity, but also to initiate and maintain a sufficient level of motivation until the end of the process.

All this requires a slightly different preparation and it does not end with a simple paper handed over to the school pedagogue as a document. In that sense, it may be better to say that project based learning requires *reflection*, and that is not so difficult to achieve, if important steps that ensure that this process yields its results are not skipped.

STEP ONE: Context

First, it should be acknowledged that not all the conditions have yet been met for our education system to support the transition to a project-based learning model. The reasons for that are the curricula of various subjects, the scope of obligations that are imposed on the student at school, the uneven equipment of schools, the initial education of teachers, etc. However, we are convinced that teachers remain the key factor that brings something new, beautiful and useful to their students, the same is true for project based learning. To plan your classes for project based learning well, we advise you to look carefully at different aspects of the context in which you are trying to introduce this innovation. Here are some topics you need to think about in advance.

All stakeholders of project based learning and its target group

We have already said that project based learning involves the whole class acting as one team. When we say *team,* by team we mean that all students are involved, each according to their abilities and affinities. Project based learning is not reserved only for gifted or talented students, on the contrary, it is an opportunity for the whole class to connect better, integrate differences between students and strengthen team spirit. There must be no compromise on this issue, and believe me, if well thought out, project based learning can have very beneficial effects in terms of socialization, integration of vulnerable groups among students or inclusion and mobilization of students with special needs.

In class, it is first of all necessary to make a good introduction and set clear *rules of communication*. It is important to explain that we are all really different, that we cannot all do everything, but that this is the reason for association and socialization. Students should be encouraged to step out of their comfort zone, but again the teachers should retain their pedagogical role and help them properly assess their abilities. Good *teamwork* also means not only that everyone is involved, but also that every team member is responsible for the dedicated work and atmosphere in the classroom. Try to set the challenge so that there is room for everyone, from the most active to the most passive, and try to keep them back to the rules - they will quickly adopt them if they really see how important they are.

It is certainly much easier to manipulate the schedule in the younger grades of primary school so that classes are connected and more time is created for work. We advise you to try to connect not only different classes (subjects), but also different bodies of students of

the same age, if there are physical conditions for that. Talk to colleagues and try to do at least some project based learning activities together. Not only will the children connect, but you will also learn a lot from each other. Maybe project based learning is an opportunity to make teachers who teach older classes interested, so the students can get the opportunity to meet them. In older classes, everything depends on the mood among colleagues and the willingness to work together. In that sense, you will try first with less complex topics, which does not require correlation of many subjects, or you will include colleagues with whom you already have a good cooperation.

A short tip: try something simple and improve it little by little. It is also one of the basic principles of project based learning and it ensures your progress not just that of your students.

Good planning of the beginning and duration of implementation

Planning of all forms of teaching in primary and secondary schools is harmonized first with the learning outcomes for each individual subject, then through school board's plans and finally through the school curriculum. The problem of interdisciplinary correlations and their implementation in the classroom is a great challenge if there is no clear position at the level of the board on the importance of planning. Any effort to implement a class that connects the topic of light in physics and biology would be in vain if the students have not yet listened about plants or the nature of light in physics is planned for another year.

Many of these very real obstacles can be solved by good planning within the school board, but also among different boards, as well as in the meetings of the pedagogical board. Limit yourself at the beginning to what you can implement easily, within existing resources, and then try to achieve better planning and larger scheduled interventions with tangible results. Rely on your experience in terms of project based learning and talk openly about it with colleagues.

A more ambitious teacher will use the beginning of the school year, when we usually introduce students to the work plan, to present the principles of project based learning to students, in order to create conditions for successful work. In any case, you need to anticipate well how much time you will devote to project based learning on a particular topic, how it fits in with the other stakeholders you want to involve, and clearly present it to students and colleagues and agree with them. The duration of project based learning depends on various factors: the level of complexity of the potential project, the number of participants you have involved, but most of all you and your students. In that sense, don't be afraid that, once you bring them to the first final result, you allow the project based learning to continue - in additional or supplementary classes or even at home, which will certainly be the case in the circumstances of distance learning.

A little advice we can give you regarding the time when you can start working in the project setting is to start this form of teaching at a time when students are rested, when they are not trying to get better grades or prepare for competitions, or when they can freely dedicate themselves to work. In short, follow the school calendar. It is true that project based learning can take time, but it is also a fact that students enjoy it and experience it as a form of motivation. These are often the classes that are remembered the longest and best.

Roughly, simpler projects usually last from 8 to 10 classes (hours), while some more complex ones last 3 to 5 weeks, and some even months. Therefore, as early as in the planning stage, take into account your school's resources, options for working from home and the willingness of students to be actively involved in such work, as well as their individual level of digital competencies, if this is a condition for active participation in project based learning.

Level of project complexity and interdisciplinary correlation

It is not easy to advise how complex a project should be, as it depends on many factors. At the same time, a more complex project is not automatically of better quality than a simple one. An experienced teacher will often find space to break down a complex topic into several simpler ones, again leaving some for project based learning and choosing some for a different approach. Below are presented guidelines on how to think about the complexity of the project, given that in general the complexity level should be determined according to the abilities of the students, and not according to the motivation or ambitions of the teacher.

Tabular presentation of the classification of project based learning efforts according to complexity.

	Simpler form of PBL	More complex form of PBL
Number of areas within the same subject	One area	Multiple areas
Interdisciplinary correlations	One to two subjects	Multiple subjects or several different diverse subjects (e.g. natural and social sciences or natural sciences and arts)
Number of participants involved	One teacher	Several teachers, external experts and / or out-of-school organizations; persons from the local community
Place of activity	Classroomand school facilities	Outside the school building, in cooperation with another institution or local company

What kind of product will be created by the project	One deliverable that does not require much time and advanced skills and tools to create	Multiple and complex deliverables
Technology to be used	A pair of already known IT tools	Several IT tools that require additional learning

One of the key advantages of project based learning is the opportunity for students to look at the same problem from different angles and thus acquire and practice knowledge and skills of different disciplines. Modern science is certainly increasingly turning to multidisciplinary and interdisciplinary approaches, so teaching and education can and should follow this trend. This, on the other hand, does not require that every teacher suddenly become an erudite in different or completely unrelated fields. It is necessary that colleagues who teach different subjects work together, and then, why not, parents, experts and institutions of the local community be involved. Museums, memorial rooms, various colleges, institutes, but also non-governmental organizations and economic entities are an inexhaustible source of opportunities for teaching, otherwise focused on theory, to be enriched with practice, and the limit can only be our willingness to include people we do not know.

STEP TWO: The idea for project based learning

This is an important, very interesting and stimulating phase of project based learning, because it invites teachers to be creative. That is why we put it in the second step - in order to limit it in advance to real possibilities. Now that the ideas have been put into context, we can "let the imagination run wild."

Teacher is not an island! You are not alone! This is important to say because we act like that too often. Hundreds and thousands of teachers in Serbia, in the countries of the European Union, all over the world do the same as you and "endure the same torments" as you. Why does each of us have to be innovative at all costs when there are a handful of great, current and relevant ideas that we can adapt and apply to our context and in our local community? That is not intellectual theft, but again a space for connection and exchange. If you just look at the *e-Twinning* platform (which will be discussed in more detail in the *Tools* section), you will see a number of possibilities that you can even get involved in right away. It is a platform that is available for free and that encourages a culture of sharing and project based learning in the best way.

If you are still not ready to connect or hesitate because of the language barrier of your students, try to find inspiration in the examples collected and presented within *Creative School* project by the Institute for the Improvement of Education. *The Buck Institute for*

Education also has its own [database of projects and resources](#) useful for any effort to try project based learning.

As you search the internet for ideas that you could apply, note the following:

- Is it an idea for project based learning or is it just a project?
- Will this concept be interesting and, more importantly, feasible with your students?
- Do the projected duration of the project and the level of complexity suit you?
- Do you have all the necessary resources and all the necessary knowledge?
- Can you harmonize the topic of the project and interdisciplinary correlations with the school curriculum?

If you feel that you are ready to come up with an idea on your own or you want to be original, that is great, you will just need a little more planning. Topics you can start with are around you: experiments and challenges that already exist described in the textbooks you use, problems at school or in the local community, some particularities that can be generated by a specific group of students. In a Fulbright exchange program, the author of this handbook encountered the phenomenal results of project based learning in college where students re-examined their own past and determined whether their ancestors were on both sides of the American Civil War or on a different side from where they are today. Maybe your environment is also multicultural or multiethnic? Maybe you have migrant students or students who come as representatives of national minorities or are of different religions? In any case, be careful, but approach boldly and you will find a large number of good quality ideas that are worth trying with your students.

STEP THREE: The logical framework of project based learning

We have already mentioned that planning and, even more so, project based learning itself is not a linear process and that it largely depends on students who have a leadership role in it. However, when thinking about project based learning, you should also think about the following:

- What are the goals of the project?
- What is the final product of project based learning and how will you present it?
- What questions can you use to encourage students to think?

Defining project based learning goals

Project based learning should lead students to:

1. acquire knowledge and understand the material,
2. acquire some key skills,
3. show themselves as team players, leaders and good people.

All this is rightly reminiscent of general and interdisciplinary competencies, and that's what's appealing about project based learning, because it naturally and very elegantly unites them. If we recall some of the many training sessions of Institute for the Improvement of Education or look at the list of interdisciplinary competencies, we will recall the competencies in

question. We will only list them here.

The table was created on the basis of data taken from the Law on the Fundamentals of the Education System.

Interdisciplinary competencies for primary education	Interdisciplinary competencies for secondary education
Learning competencies	Competences for Lifelong Learning
Responsible participation in a democratic society	Communication
Aesthetic competence	Working with data and information
Communication	Digital competence
Responsible attitude towards the environment	Problem solving
Responsible attitude towards health	Cooperation
Resourcefulness and entrepreneurial orientation	Responsible participation in a democratic society
Working with data and information	Responsible attitude towards health
Problem solving	Responsible attitude towards the environment
Cooperation	Aesthetic competence
Digital competence	Entrepreneurship and entrepreneurial competence

Combined with knowledge and outcomes specific to your subject, these competencies become a pillar of the project based learning process. Look at the school curriculum, syllabus for your subject and other subjects of your students and write down clearly the goals you want to achieve through project based learning. In terms of content, it is quite enough to focus on two to three goals so that students can understand and better remember what they came to through project based learning.

With respect to skills, the Introduction lists the 21st century skills. Three are crucial for project based learning:

1. critical thinking and the ability to solve problems,

2. cooperation,
3. ability to self-organize (we independently manage our time and responsibilities).

Always keep in mind: even when it seems that everything went wrong and that the project will not be implemented, the students, if you had these three skills in mind when planning, were given the opportunity to practice them. They will succeed next time, if you notice and analyze together where they went wrong or what skills they need to develop more in order to succeed.

John Dewey says about this:

We do not learn from experience. We learn from reflecting on experience.

Perhaps we should illustrate this quote with a personal example of one of the authors. Milan imagined a very ambitious journalism section at school. The students organized a small newsroom, but were not satisfied with the results of their work. Neither the text of the news, nor the quality of the photos were at the level they expected, and they worked hard to publish the news on the website. In that sense, it would be said that the whole project was a complete failure. Then they had a conversation in which they looked at the whole process together, saw and listed the weak points and made a plan so that it could be better.

Why, after all, was this not a failure? First of all, by perceiving their own failure, the students realized that there is room for further improvement, personal development and learning. The process of reflection not only did not diminish motivation, but it showed the "leaders" among them and more strongly motivated everyone to try again. Also, they agreed that the necessary knowledge may not come from the school, so next year they called experts from the local media for help, who were happy to get involved. A couple of generations later, as the project continued from one generation to another, a portal was created to enable young people to write for young people. [Youth Vibes](#) received financial support and expanded as a project, and it even created newsrooms in other cities in Serbia! Something that started as a failure in terms of one teacher's assessment, thanks to the project based learning process, became an opportunity for students across the country and expanded outside of the boundaries of the school.

Choice of final product and presentation possibilities

Instead of just learning and focusing on memorizing data, project based learning helps students create something tangible that they can show to others. Examples of what students are able to create are an inexhaustible source of admiration and inspiration. When you think about it, ask yourself the following:

- Does this product clearly show that students have achieved the planned goals?
- Is the final product authentic?
- Is it feasible for them to make it?
- Which part will the students create individually, and what as a team?
- If we divided them into several teams - will all teams have the same product or will they be different?

All this is important because of the assessment of achievements within project based learning, which we will talk more about at the end of this chapter, but for now it is enough to point that we do not give grades exclusively for team achievements, instead we from the beginning look at the final product as a sum of parts and thus give individual tasks to each team member. In this way, project based learning, although essentially a team activity, leaves room for individual progress and its evaluation.

When all this is planned, it will be easy to choose the final product, i.e. what you will require the students to do during the implementation of project based learning. In any case, project based learning can end with one or more solutions. Practically, the number of possible ideas is unlimited, and we took this list from the book: *Setting the Standard for Project Based Learning*.

Presentations (including any live performance: physically or remotely)

- Public Speaking
- Poetry reading
- Debate
- Musical composition or game
- Public event
- Role play
- Panel discussion
- Pitch

Written materials (including academic and other writing styles, but always write for specific audiences or specific genuine purpose, not only as a school assignment)

- Research report
- Book overview / review
- Letter
- Training manual
- Brochure
- Mathematical analysis
- Script
- Blog
- Scientific study / experiment report
- Editorial

Media and IT products (including conventional and the so-called "new" media)

- Podcast
- Video / animation
- Website
- Slideshow
- Drawing / image
- Application
- Photo essay
- Comic

- Collage

Constructed product (everything that the students themselves made authentically, without anyone else's help)

- Scientific instrument
- Consumer product
- Museum exhibit
- Device / machine
- Vehicle
- Invention

Writing a challenging question

Sometimes you have a good idea for a project, but you are not sure how to get students to think about it. You will address it within project based leaning with a *challenging question*. It is a statement that is best formulated in a language close to your students., You can leave it on the board during the whole process so that it reminds the students of the purpose of their work. The statement is defined in order to stimulate students' interest and focus their attention on the key ideas, questions and knowledge they want to gain.

A good challenging question is open-ended, closely related to learning objectives. Some teachers deliberately define a challenging question in agreement with their students, because in this way students feel as if they have been entrusted with ownership of the whole project and the process itself, which can be crucial for their motivation. Based on its many years of experience in the application of project based learning, the previously mentioned Buck Institute for Education proposes the following classification of projects, according to their content:

1. Solving real problems
2. Getting acquainted with creative challenges
3. Exploring abstract questions
4. Conducting research
5. Taking a stand on an issue

With this in mind, we again present examples of challenging questions from the book "*Setting the Standard for Project Based Learning*":

Solving real problems

How can we, as students, develop a CV that will attract employers?

How can we, as entrepreneurs, develop a business plan that will attract investors?

How can our city develop more efficient city transport?

Getting acquainted with creative challenges

How can we create a platform that will inform young people about training opportunities?

How can we raise money to fight cancer?

How can we organize a bike tour and visit important historical places in our city?

Exploring abstract questions

Who is the hero?

What is good and what is bad?

What evidence is needed to believe a scientific claim?

Why is it raining?

Conducting research

How good is our drinking water?

How much time does the average young person spend on social media?

Who could have studied 100 years ago?

Which national event has most influenced the history of our society?

Taking a stand on an issue

Should we eat meat? (Why yes? Why not?)

Should we kill snakes? (Why yes? Why not?)

Should certain books be censored? (Why yes? Why not?)

Implementation and monitoring of project based learning

Much of what is really important for the implementation of project based learning we have already said. Good preparation is really half the success in teaching, especially when it comes to a challenge you haven't tried before. However, we want to draw attention to a few important details.

Communication and division of roles

A good teacher, in our opinion, is a brave teacher. He or she is not afraid to tackle difficult, yet important and current topics. Such courage always carries with it the danger that we have not assessed well enough the readiness of students to step out of their comfort zone

and the fact that things can go in a direction that the teacher cannot control. It doesn't take years of experience for a teacher to know that students can quarrel over little things, let alone deeply and long-held beliefs. Such situations are always challenging, and if they happen within the framework of distance learning, they seem almost hopeless, which brings us back to how important good preparation is.

However, what should we do if we have already found ourselves in such a situation? We will reveal one secret to you as a recipe.

Protect the way you communicate!

For something like that, preparation is needed, but also with it, it takes courage to interrupt someone or, in the case of remote work, even turn off the microphone with an apology. Every workshop host knows that basic rules must be set before every good workshop and most of them refer to good communication and mutual respect. You need to be aware that online communication opens up additional dangers of *cyber violence*. UNICEF has worked a lot on the prevention of digital violence and how to prevent it, so in that sense they are a good [reference point](#) when preparing for online classes. If you manage to convince your students that good communication is the key to success, not only during classes, but that it is one of the basic characteristics by which successful people in all spheres of life are recognized, you have achieved a lot.

One way to ensure good communication is to have a good division of roles. Don't experiment with young people if you don't know them at least minimally or if you don't have a lot of experience in resolving crisis situations. Instead, try making the following **roles**. For each student:
- write down on paper or in the table the student's full name,
- write down his key talents, what he is good at,
- write down one thing that represents his weakness compared to others,
- in addition to that list try to make a list of activities that your project involves,
- leave space for notes on your observations (more on that in the next chapter).

We are confident that you will see the matches yourself: help them show everyone what they are good at, and work on what they are not. For instance, if you have a student who is well organized, tidy and independent, but a little shy as a person, let that student have a leadership position in some aspect. Help that student to express his/her sense of organization, and overcome the challenge of being shy through positive communication with others, which will definitely occur if he/she is put in a leadership position. It is difficult to construct a good example, because each pedagogical situation is specific in itself, but you must believe in your abilities as a pedagogue to assess the situation correctly. A sincere effort to create a context in which your students can experiment safely and smoothly and improve themselves will be rewarded with the greatest gratitude.

Maintaining motivation and monitoring the work

As the project you put in front of the students becomes more complex, so does the time necessary for it to be implemented. The length of the project will inevitably affect the

motivation of students, who are actually eagerly waiting to see a tangible result. [The data](#) tells us that the attention of new generations has diminished, which is a potential challenge we need to be aware of. This is a problem and although project based learning as a model offers greater motivation of students as its principal advantage, in practice it can often be overwhelming due to the pressure of work, other life and school obligations or simply due to loss of interest. In short, it is our responsibility as educators to motivate and encourage students to believe in the learning process, even when the results are not (yet) obvious.

Artificial motivation should be avoided as much as possible; this is often seen in cases when the student is constantly looking for incentives and praise in order to fulfill the undertaken obligations. This is not a principle of success of project based learning and it is completely unsustainable in distance learning. It is necessary to help students find motivation in themselves! How is this achieved? One of the most effective methods can be joint detailed planning. In projects run by organizations, **Gantt chart of activities** is often used. It is one timeline with a list of all activities leading to the desired result; the key points and persons participating in each of the activities are marked; the places where the intersections are expected and some tangible parts of the final result are determined. In that way, a big job is divided into measurable parts, each team member has a clear role and, most importantly, the impression that participants are waiting for something to happen is shattered, instead, it is clear that the work is constantly going on, although not everyone is always equally actively involved.

This technique can be easily applied in the classroom; a simple table containing the basic data from Gantt chart can be easily made in Microsoft Excel sheet or even on a board or a large paper that can be left on a wall of the classroom until the end of the project. In this way, you will encourage students to be motivated, but also teach them how to better organize their time. In addition, this Gantt chart can help you better assess the successes and possible failures of your students when you get to the next phase - evaluation of activities.

Evaluating student achievement during project based learning

The big mistake that occurs in group activities is the traditional way of performance assessment. In practice, it varies between two extremes. One is reflected in the view that each time a group is doing something it should be assigned a "group grade", which may be the highest if a result is achieved, but it will certainly be unfair and will not reflect the true state of progress of each student. At the same time, such a practice makes the assessment of the most active students meaningless and deprives those who are less active for useful feedback from which they could learn something. The other extreme is that, following the line of least resistance, and yet for the sake of fairness, the assessment is completely absent. Again, there is no adequate feedback, which must be individualized, so the assessment process is often rendered meaningless, this time regardless of the end result, which can affect student motivation.

Performance assessment, if done for the sake of immediate grading, is difficult. In the end,

teachers in our education system are still expected to give a formative assessment and describe the work of students throughout the year in one digit. We forget, in addition, that in addition to the formative, there is another, *summative* assessment, which is much more important in project based learning. All personal successes in overcoming nervousness, wonderful moments of teamwork, good upbringing or humanity itself can be lost if we focus exclusively on the outcomes of knowledge acquisition in assessment. Project based learning does not allow this and constantly brings us back to these qualities of growth and development of student achievement, which gives (some would even say *returns*) a humane dimension to the educational process.

The assessment must be justified and publicly explained, and this is ultimately written in the law that regulates this area of primary and secondary education in detail. If you want to assess students' knowledge or the degree of mastery of a skill as part of distance learning, the assessment tools described at the end of the next chapter will be useful. What is important to underline is that project based learning as an approach leaves room, not only to evaluate the acquired knowledge and skills in the traditional way through tests and oral exams, but also to take into account sometimes very personal and difficult to measure progress in the mentioned interdisciplinary competencies.

Remember the division by roles we advised you to make at the very beginning of this chapter? We advised you to leave room for your personal observations. Describe how the student behaved in the team, how he communicated, whether and to what extent he was responsible, result-oriented, quick to agree and ready to accept responsibilities; notice small successes in overcoming nervousness or a bright moment when someone came up with an idea that "saved the day". These are all important elements that, if you wish, you have the absolute right to describe in detail and turn into an assessment. In any case, these observations will help you to give them a stimulating comment and feedback on the work within the project in a timely manner.

Tools for planning and implementation of project based learning at a distance

In the situation in which the educational system found itself, every form of teaching, including project based learning, is implemented at a distance. We appreciate the significant efforts of the volunteer teachers, the Ministry, the Institute for the Improvement of Education and RTS, who reacted quickly and, in cooperation with the teachers, ensured that the lessons were followed on their TV channels. This has given many teachers, especially primary school teachers, time to adjust and organize. If we can be so free to say that, we lacked educational content on channels with a national frequency, and it is also nice that some hidden heroes of Serbian education received some long-deserved media attention. However, following the lessons that someone teaches on TV is a one-way communication in which students are in a passive role. In that sense, it is a great merit of every teacher who managed to establish a different contact with students and to use some of the tools for work and distance learning.

This handbook should help all teachers to better prepare for the next school year and in general for the challenges of project based learning and distance learning. Therefore, in this

chapter we have selected and described some of the most important tools for the implementation of distance learning. From a large number of excellent examples, we have singled out those that already have some stability, first of all they have been tested and have existed long enough to be tested, and we also took care that they are free to use. We organized them in three groups, according to the stages of teaching, namely:

1. those who will help you prepare and organize your work,
2. those who will help you implement teaching and monitor student work,
3. those who could help you evaluate student achievement.

Combined with online resources, which we have presented in the next chapter, they make powerful tools not only in the implementation of distance learning, but in the implementation of project based learning in general.

Digital tools to prepare and organize project based learning and distance learning

As already mentioned in the chapter on project based learning, its key element is the cooperation of students, their initiative, motivation and critical thinking. All of the above can be a challenge, and distance learning only further complicates the organization and moderation of the educational process. In the selection of tools presented in this chapter, we were guided primarily by the view that they must be easy to use, accessible and, ideally free of charge when used for educational purposes.

We wanted to show some that have not been used enough, although they have been present for a long time, because we consider them a useful additional tool that helps students to prepare independently (remotely), learn from the experiences of experts from around the world. According to the author, this is one of the biggest advantages of distance learning. Therefore, you will see tools that are not intended specifically for project based learning, but will certainly be useful for students and professors to enrich teaching with additional content and opportunities offered by distance learning.

Udemy

Udemy is a platform that connects students with a large number of instructors. As professionals in your field, it gives you the opportunity to teach what you know or teach what you love, and millions of students from all over the world are waiting to learn from you. The standard course on this platform is based on videos. Each course must have at least **30 minutes of video** content and at least **5 lectures, i.e., learning modules**. There are also additional teaching tools, such as assignments, quizzes, forums, etc., that serve to enhance the learning experience and offer a way to measure achievement due to potential certification.

Teachers often do not even imagine Udemy as an option that will help them organize lectures, because subconsciously they think that it is a platform on which everything is charged. It is true that there is no fee to be an instructor at Udemy. On the other hand, there is an option to earn, if you set a price for your course, but it is not necessary, especially not at the beginning. No special approval is required to create a course. Create an account and

easily create your course, using a simple menu with options. Before your course is published on the platform, it undergoes a quality assessment. There are [minimum prescribed requirements](#) that must be met by each and even the free course. As an instructor, you reserve all rights to the content of the published course. The course itself can be set in any language of your choice.

What are the benefits of the Udemy platform?

- It's free to use. At the same time, it is extremely compatible with all devices (mobile phone, laptop, tablet, desktop computer), which further enables students to improve their knowledge anytime and anywhere.
- The Udemy community of educators supports you at all times; Guidelines on how to use the platform and how, for example, to create a course that will hold attention in an online environment, are available to you both in writing and through video tutorials.
- The interface of the platform has been evolving over the years and therefore it is much easier to use the platform, or to create courses on Udemy than on some other similar platforms
- The format of the course, which is based on video content, allows students to gain knowledge at any time, for example while running or while in transport (they need headphones, a mobile phone and an internet connection).

Google Classroom

Google was able to look ahead in 2014, and then new set of online applications called *G Suite* made available **for free for all educational institutions** within the project *[Google for Education](#)*. *Naturally,* you can use all these applications (and your students may already know them) separately, but used together they make a fantastic project teaching tool. When we talk about Google Classroom, we are talking about a set of tools that includes:

- [Gmail](#) - email system,
- [Google Drive](#) - online drive,
- [Google Calendar](#) - an application for keeping calendars and schedules,
- [Google Docs](#), [Sheets](#) and [Google Slide](#) - online collaboration applications for text, tables and slide presentations,
- [Google Forms](#) - creating questionnaires, quizzes and surveys with automatic processing of results.

Recently, the following have been added to this list of applications:

- [Google Meet](#) - an application for direct audio and video communication via calls,
- [Jamboard](#) - an application similar to the online whiteboard.

Google Classroom actually combines all these services into one system that allows you to share tasks, tests and communicate with students in one place. It is possible to open more classrooms, organize by subjects, connect with colleagues and use all the tools listed above

for cooperation with students and among teachers.
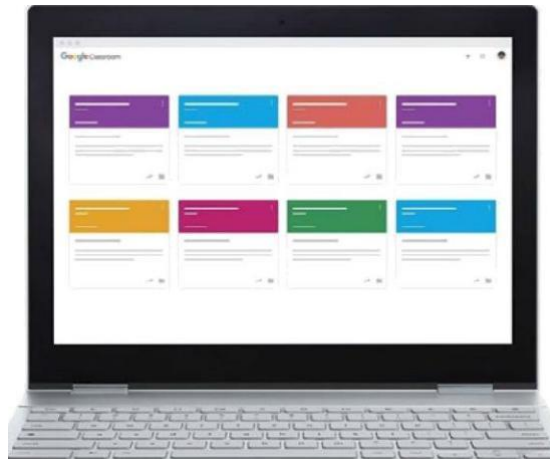
What are the benefits of Google Classroom?

- **It is clear and practical to** have everything in one place. A wide range of free applications, easy to use, enables diversity in working with students and organizing project based learning. These same tools are also present in large global companies, so by choosing this service, you prepare your students to be digitally literate and ready for later cooperation in teams at work.
- **The system is free and stable.** During the corona virus pandemic, Google invested additional funds to strengthen its servers and ensure the smooth operation of tens of thousands of schools around the world that use this system.
- There are **simple and available online courses** on how to start using this system. Short video lessons will help you find your way and quickly become an expert in online teaching.
- Many external **services are well connected to Google Classroom**, so you can easily "import" other applications into your Google Classroom. Also, Google has invested a lot in the resources available to you and your students, and that will be of great benefit when planning your project classes

A word from the teacher

"Teachers can easily add students to the classroom or add a classroom code to a particular class. Tasks are set in a simple way and can be done without paper, that is, students can perform tasks directly in the Google Classroom. In addition to the option to add tasks with instructions, we can also add a deadline for completion of work, which contains the exact date and time.

The teacher can follow the course of the task on his account. The teacher can see the number of students who have done or have not done the assignments and evaluate the students. All grades can be copied to Google tables and analysis can be performed.

Students may be given back tasks they did not do or tasks they need to correct. Also, Google Classroom has the option of making tests, with the ability to check and analyze the answers.

All material that students submit is stored on Google Drive. Students can follow all the homework and after the preparation, read the grades and feedback in the form of comments from the teacher.
The teacher has the opportunity to start a group discussion i
n the Google Classroom and to post videos, pictures, texts, etc. to the students. The disadvantage of the platform is that
it is not possible to hold live lectures." Jelena Lilic, history teacher, Platicevo

Khan Academy Serbia

If you follow the TED Talk and its motivational speeches, you have probably come across Salman Khan and his speech from 2011. *Let's use video to reinvent education.* In that speech, Kahn, who is not really a professor by profession, explained how he recorded short video lessons in 2004 to tutor in math his cousin on the other side of the world.

VIDEO:https://www.ted.com/talks/sal_khan_let_s_use_video_to_reinvent_education?utm_campaign=tedspread&utm_medium=referral&utm_source=tedcomshare

His modest efforts twelve years later created the **Khan Academy**, a platform with over 42 million registered users from over 190 countries, tutorials in mathematics, art, history, computing, biology, medicine and much more. This non-governmental organization has created a platform that allows us to offer short, video, online lessons for our students in Serbian

Khan Academy Serbia is open and free for students, teachers and parents. The platform has already allowed free access to materials, in a large number of languages. While courses in Serbian are not at the top in terms of their number, it does not mean that you cannot easily use them. The registration process is simple, and using the platform is free.

What are the advantages of *Khan's Academy Serbia*?

- The focus of the content is on **video lessons,** which is relatively easy to do, and the platform is **open and free for everyone**.
- Video content allows students to **watch the videos again, to come back multiple times** in a desire to learn and better understand the lessons.
- The platform offers the possibility of gradual **testing of learned material** and special **support for teachers**.

Microsoft Teams

Relatively soon after the state of emergency was declared in Serbia due to the outbreak of the Corona virus, the Microsoft Development Center in Serbia offered free access to their application, which helps to organize classes in the online setting. As in the case of Google Classroom, it is an application that combines several different tools and enables distance learning, and the Ministry has published on its website a user manual in Serbian..

In Microsoft Teams, you can easily make a classroom for your subject, create assignments and post them to students and divide students into different teams. In addition to video and voice conferencing, you can add various resources or tasks within the application and monitor the work of your students. Probably everyone has already had the opportunity to use the famous Microsoft apps such as *Word*, *Excel* or *Power Point* - this experience will now be of great benefit to you because *Office365 is* integrated into Microsoft Teams. In addition to the features offered by these programs, there are also brand new options such as a calendar, whiteboard, interactive presentations in the *Sway* and other add-ons.
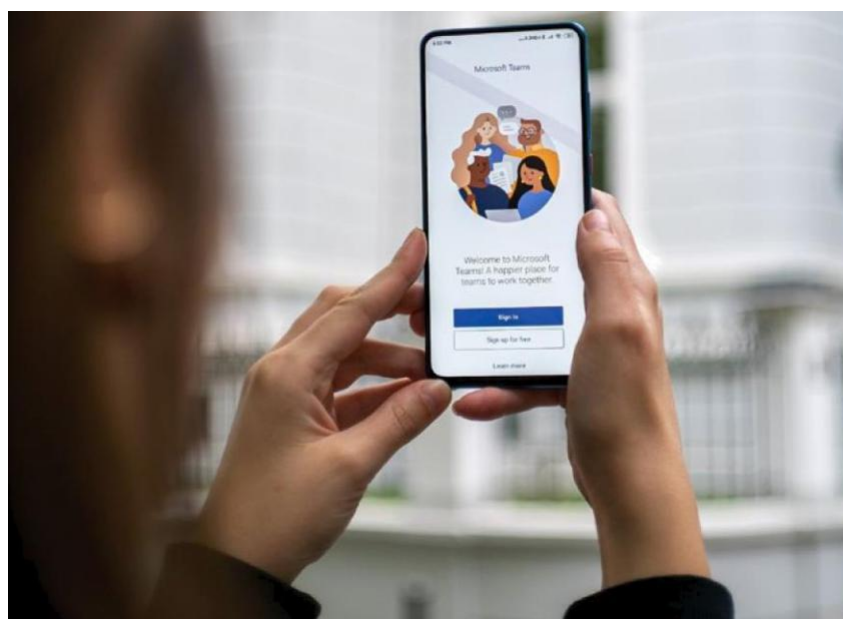
Digital tools to monitor and implement project based learning and distance learning

Teleworking and distance learning puts us in a situation where we have to use different digital tools to research, collaborate and create. The tools presented in this chapter will be especially useful for distance learning, but many of them can be used to enrich the educational process during live classroom teaching.

The authors of the manual made an effort to offer with each of the tools a brief example of how it can be used in project based learning. We especially emphasize that many of these tools can be used to produce the mentioned *final product of* project based learning, even during live classroom teaching. In that case, they strengthen students' digital literacy. Tools, such as e.g. Slack are used for communication in all major global companies. Google Maps have a practical application in everyday life. The European Union's project portal, the *e-Twinning* platform, allows us to easily connect and work on projects with other schools and colleagues across Europe. Most of these tools are now experiencing a kind of golden age during distance learning, but their value in both the educational process and real life is undeniable.

Google Earth and Google Maps

When studying geography, one of the most important outcomes is the ability to navigate a map or globe. Very few applications is so practical and useful for these purposes, such as *Google Earth* or *Google Maps*. *Both* services work in a *browser*, but they also exist as mobile applications, whether they run on Android or iOS. Google Earth allows you to not only zoom in different parts of the planet to the extent that you see the streets, but also it can be used as an online space for project based learning and student collaboration.

This three-dimensional representation of the planet Earth, which Google advertises as the *most detailed globe in the world*, already contains some useful tools.

- You can choose from several types of folders that are easy to change in the sidebar menu.
- It is possible to measure the distance between any two or more points.
- There is also a quick search by name, which will make it easier to navigate.
- Google has made an effort to supplement its globe with short articles and photos and make it an interactive research tool.
- A satellite image used to create Google Earth enables you to zoom in the image so that you can see the streets, buildings and famous cultural monuments.
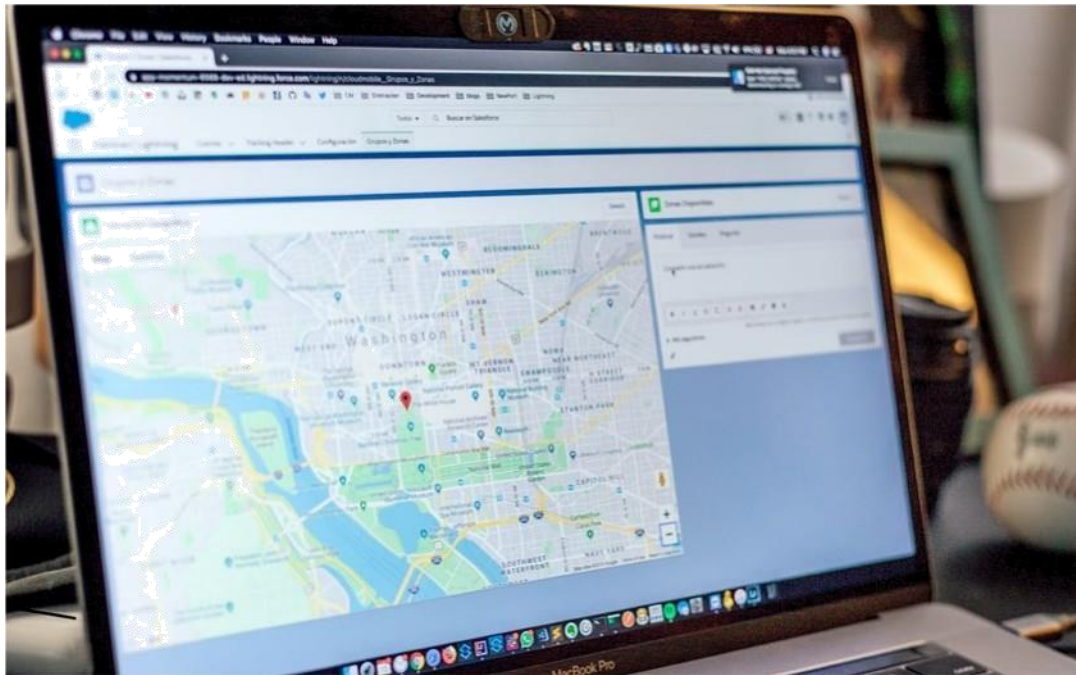
Google Earth and Google Maps allow us *to create joint projects*. Invite students to participate using this tool. They can present a historical battle by adding location points, photos, texts and videos and thus explain what happened. They can mark the birthplaces of writers, poets, artists, painters, musicians, scientists or mark events from the biographies of these noteworthy people. If you want to try, give them a chance to show you their last school trip destination or vacation spots. In the classes with younger children, use Google Maps to show students the way from home to school, to mark the place of residence of all friends in the class, or to teach them to recognize parts of the city or plan a trip.

Time Graphics

Just like students can cooperate and organize a variety of topics in Google Earth or in a presentation (e.g. Google Slide, which is part of the already mentioned *Google for Education* package), Time Graphics gives them the opportunity to create timelines. Timelines are not only used in history lessons - they can be useful for understanding literature movements, philosophy, art, and even IT development or some computer science topics.

VIDEO:https://www.youtube.com/watch?v=nMDy-B1YJVc&feature=emb_rel_end

Multiple students can work on a single timeline at the same time or draw parallel lines together with a teacher who can help or supervise the work of their students.

What are the benefits of Time Graphs?

- Easily integrates and connects to almost all Google tools.
- You can save or print the timeline or publish it on the website.
- There are already a number of ready-made, free timelines that you can use as a resource.

Kialo

Even the most traditional approaches continue to appreciate the dialogic method and conversation in class. Modern teachers have been successfully using debate for some time as a way to encourage common thinking in class, re-examining values and facts. Kialo is an application that will help you put a debate or discussion with your students on the Internet. Whether you opt for a synchronous or asynchronous approach to teaching, Kialo will help both you and your students:

- get everyone involved - either by giving a new argument for or against, or by supporting or elaborating on some of the existing arguments;
- to follow complex debates, regardless of the number of participants and arguments;
- to separate arguments from examples and superfluous comments in decision-making.

The Kialo platform has already hosted numerous very current debates, globally, so Kialo is at the same time a tool and resource for research and preparation for teaching, regardless of which subject you teach. Get your students to debate, free up time during synchronous classes, or include a discussion as an additional task or a small competition that motivates students to explore.

Explore Discussions

VIDEO: https://www.kialo.com/tour

e-Twinning

E-Twinning is an internet portal that connects employees in schools and preschools with the aim of enabling them to jointly design, manage and implement projects, exchange ideas and best practices, connect students and supplement teaching content.

A key feature of this portal lies in the promotion of cooperation between educational institutions and their employees across Europe. This exchange and networking is accomplished through the use of digital tools.

The portal offers the following possibilities:

a. public part, which is available to everyone,
b. *e-Twinning live*, part which can be accessed by registered and verified members,
c. *Twinspace*, part which can be used only by registered members who initiated the project on e-Twinning.

The public part of the portal functions as a public service; it is accessible and visible to all who access the portal, and serves to inform the interested public about events within the e - Twinning community.

e-Twinning live is an exclusive part and is reserved only for members who register and whose registration is approved by the national team of the Tempus Foundation in Serbia. In order for the registration to be approved, it is necessary for the employee from the educational institution, who wants to register, to submit an employment verification letter of the educational institution.

The possibilities of the *e-Twinning live* part of the portal are reflected in the following:

a.   **people** - offers an overview of teachers, serves to connect among colleagues across Europe;

b.   **events** - this section provides an overview of upcoming and completed events in the e-Twinning community;

c.   **projects** - within this part it is possible to review completed and currently current projects. The most important functionality of this section is the ability to initiate a project, simply by clicking the button *Create Project*.

d.   **groups** - function similarly to Facebook, teachers have the opportunity to create their own micro-communities based on specific interests (e.g.: digital tools).

e.   **partner forums** - serves to connect teachers who are looking for colleagues to start projects. In addition, it offers the possibility of finding partners for Erasmus + projects.

f.   **professional development -** offers in one place a clear overview of exceptional opportunities for online training within the e-Twinning portal.

Twinspace part of the portal becomes available when your e-Twinning project is approved. Twinspace offers you a set of tools for project planning and implementation. It also allows you to communicate easily with project partners.

The benefits of **e-Twinning?**

- Use of the portal is free and secure. The school principal or any authorized person is required to register the school.
- The portal offers teachers to thoughtfully and strategically develop their digital literacy.
- The portal itself is characterized by an exceptional base of employees in educational institutions (potential associates), as well as knowledge, which can inspire other teachers to action at any time.

A word from the teacher

"E-Twinning is a portal that connects staff in preschools and schools across Europe and allows them to jointly design and implement virtual projects, exchange ideas and best practices, connect students and improve teaching. Since the school year 2015/2016 together with my students I have been involved in various international projects, which helped us become more familiar with the culture and tradition of other European countries, and at the same time we were able to promote our culture, city, country, and develop the 21st century skills.

Virtual *e-Twinning* projects are linked to the school curriculum, are flexible and allow students to expand their knowledge on different topics, in a fun way, which increases their motivation. " - Dragana Videnov, an English Teacher, Sveti Sava Primary School, Kikinda

Slack

Slack is a simple and intuitive application for team communication and collaboration, founded by Stewart Butterfield in 2013. The name is actually an acronym *Searchable Log of all Conversation and Knowledge*.

It provides extremely transparent communication experience and search documents, therefore it is applied around the world, both in the economic sector and formal and informal education programs. The communities use it (e.g. - one-class, where the teacher is the administrator) as a substitute for communication via e-mail and messaging services.

Slack is a free application, and, in addition, it is easy to connect to other applications, such as Google online tools such as Drive or Dox, which is extremely important, because it makes the work easier for teams, users of the application search through keywords and filters, or, in other words, members of the community that uses the application quickly access information, unlike those that search for example Viber chat or any email service.

What are the benefits of Slack?

- It can be used via the application on the phone, laptop, tablet and desktop computer, and it is open and free.
- Allows communities, groups, or teams to join the app through a specific URL, or through an invitation sent by the team owner.
- Visibility within the application is one of the key features. The content itself, or communication between team members is organized via # (hashtags), i.e., channel.
- The teacher can segment the communication with his students, creating, for example, #channellessonone, then #channellessontwo or #channeltests, where the teacher can also decide which of the students will have access to the channel.
- Privacy is enabled, i.e. the creation of private channels within the group, in which the conversation takes place, which allows the teacher to divide the class into teams, where the teacher has access to all teams, while, on the other hand, teams cannot follow private conversations of other teams.
- It can also find its application in organized communication with parents, because unlike Viber, for example, it offers the possibility of organized communication.

Canvanizer

Canvanizer is a web application that allows teams to strategically reflect on and analyze business done by an enterprise, an organization and other institutions. This dynamic and specific online tool provides an opportunity, primarily for teachers who teach entrepreneurship, to meaningfully teach entrepreneurship at a distance.

Canvanizer uses business model canvas, which was first introduced to the public in the book by Swiss scientists *Alex Osterwalder - Business Model* Generation, published in 2010.

This business model enabled everyone to see the strategic business of companies, organizations and institutions in just 20 minutes and on only one paper, i.e. canvas.

Visual presentation of the model:

The advantages of the Canvanizer are reflected in the following:

- The teacher creates an initial form in one minute, indicating his/her e-mail and entering the name of the project (e.g. *Architecture company*).
- Canvanizer is **free** and there are no restrictions on the number of users.
- It is based on URL invitation, the owner of the account sends a link to the created project via, for example, Viber group or Slack application and thus invites students to apply.
- The tool is visual and practical, it is characterized by easy addition of various objects (such as sticky papers in electronic form), which are added to the wall in blocks, or parts of the business model. An additional advantage is that each object has the option to change the color, which makes the content more visible.
- Another good feature of this tool is the automated presentation, which provides an opportunity to easily convert all content into a presentation, which can be in *Power Point* format or web presentation form, which is again accessible via a URL link that is easily shared.

Zooniverse

Zooniverse is a citizen scientific web portal managed by the Citizen Science Alliance. It is one of the largest and most popular projects in the world in which researchers are citizens. It is an interesting fact that more than a million citizens around the world have so far have contributed to various research on the platform, research is done on a volunteer basis, in order to help professional researchers. The fact is that Zooniverse research often leads to new discoveries, data sets useful to the wider research community, and many other scientific publications.

The platform encourages everyone to become a researcher. In other words, you do not need previous experience to start a research project, nor will you need academic experience to make a contribution with your research work to already posted projects. The projects implemented so far through the platform concern a wide variety of disciplines, including

astronomy, ecology, molecular biology, humanities and climate sciences.

Advantages of the Zooniverse platform?
- It allows us to engage in science everywhere; the platform is well adapted to all devices, from smartphones to tablets, laptops and desktops.
- The platform is free and there are no restrictions on the number of citizens who can work on a project.
- It offers the opportunity to create a project through a pre-defined questionnaire on the platform itself and additional instructions that contribute to the development and presentation of the project in a way that will inspire citizens around the world to get involved and contribute to the research challenge.
- Given that its community is made of millions of citizens, networking with citizens around the world and working together on a project is one of the most important features of the Zooniverse scientific web portal.
- An added benefit - if you initiated the project through Zooniverse - you also have the opportunity to request that the entire community of one million users of this portal review the project and provide feedback, both on the project itself and on the research products.

Digital tools to evaluate student achievement during project based learning and distance learning

When we talked about project based learning, we mentioned the challenges of evaluation and assessment. Much of what is crucial in this approach is difficult to measure and evaluate on a scale of one to five, which is certainly always expected in the context of our society and education system. We suggested that the culture of self-evaluation among students should be developed, every opportunity should be used to evaluate the development of skills and interdisciplinary correlations through feedback and formative assessment methods, which are certainly very important and have recently been recognized by the Ministry of Education and other key institutions.

On the other hand, we are aware that, practically speaking, teachers face one of the main challenges of assessment every single day - *how to measure what is measurable and how to explain the assessment?* In the context of distance learning, we wanted to show some of the tools that can be useful. It should be noted that, as with all other tools we mention in the handbook, these too cannot adequately replace the student's direct conversation with the teacher. It is our belief that these tools should be used reasonably and critically, more as an aid, and certainly not as a substitute for other assessment methods.

In this chapter, we also drew attention to some "alternative" tools that measure different achievements, and are being developed and recognized at the European level. Many other digital tools and services (such as Štreber website (Nerd) or - *Vučilo – Dolina magičnih reči* application (Vučilo- Valley of Magic Words),show that there is excellent and successful effort to create tools for local purposes and in our language. They touch upon an important field of didactics, in our opinion somewhat neglected, which encourages self-esteem in students.

Quizizz

Among online applications for testing students' knowledge, few apps are so simple and so widely applicable as Quizizz. The experiences of millions of teachers around the world confirm that the test is very easy to do (easy to use and multiple times), and students enjoy doing them. Although project based learning does not require much testing, we will remind you –
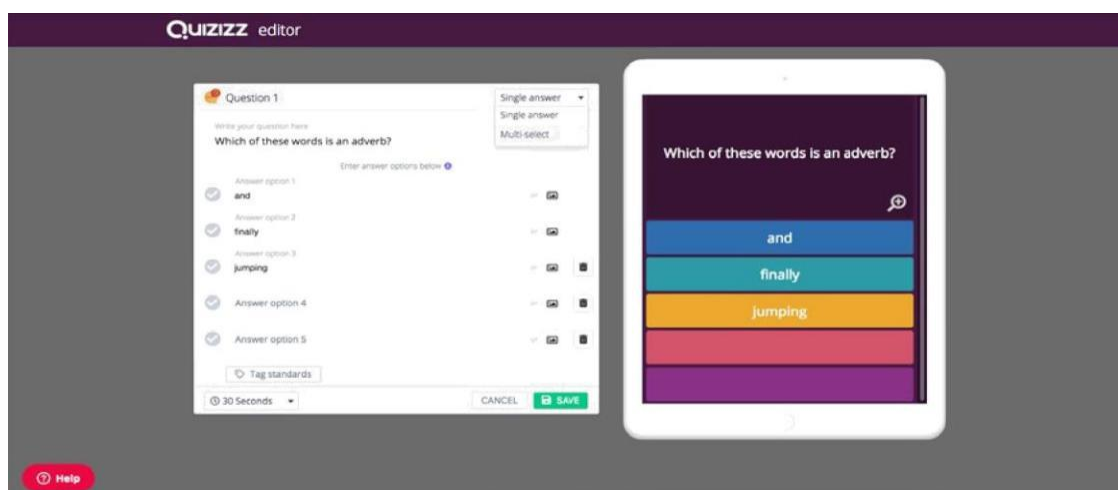
tests do not only serve assessment purposes, but are also used to monitor learning, as refreshers, and even as a form of learning.

You can open a Quizizz account for free, and for testing purposes students do not need to register their own accounts - it is enough to open a browser and enter a special code that appears every time you run the quiz. Even a weaker but stable internet connection is enough for the testing to be done efficiently, and the questions you have created appear in a different order to each student, so there is no cheating. You can view test results even while students are working, and achievement statistics are stored in your account - they can be printed or shared by email. Quizizz tests are easily imported into Google Classroom and shared on other platforms.

The questions you can ask are reduced to marking one or more correct answers (which we advise as the most practical way). If the questions are open or it is a questioning of students, then there can be no correct and incorrect answers. It is easy to add a picture or video, write a mathematical formula, and for each question you can allow as much time as you want to give students to answer. The whole test is designed as a competition with sounds and pictures between questions, which motivates students, and there is also an opportunity to try to do one thing every ten questions.

What are the advantages of Quizizz?

- Very **interesting and easy** to use.
- You can easily find **other colleagues' quizzes** and use them for free.
- **Excellent statistics** for tracking student achievement.
- It is applicable for a wide range of **different subjects**.
- It covers the needs of different testing methods.
- It helps you **plan your time in cla**ss.

Kahoot

What you see here is a testing tool that has been around and loved for so long that both companies and large foundations use it. The data they are proud of - over 30 million active questionnaires and tests on the Internet certainly shows that Kahoot is widely used. You will get used to it - tests are done on the website https://kahoot.com/, and students who take the test use another site http://kahoot.it/. Creating questions is easy, and solving tests is even easier.

Registration at Kahoot is free, and students do not have to be registered. Questions are posed in the form of a *multiple choice question,* i.e. marking the correct answer among the offered, and the time for giving the answer is limited. The panel in which you make questions is similar to the one you are used to when making presentations, because the questions are organized as slides. Many teachers are very pleased with the opportunities offered by Kahoot, especially since they have been forced to adapt to distance learning. There is, however, one difference compared to the Quizizz - students here answer the questions in the same order and, even if they use mobile devices to do the test, they will have to look at the questions on a shared monitor or projector.
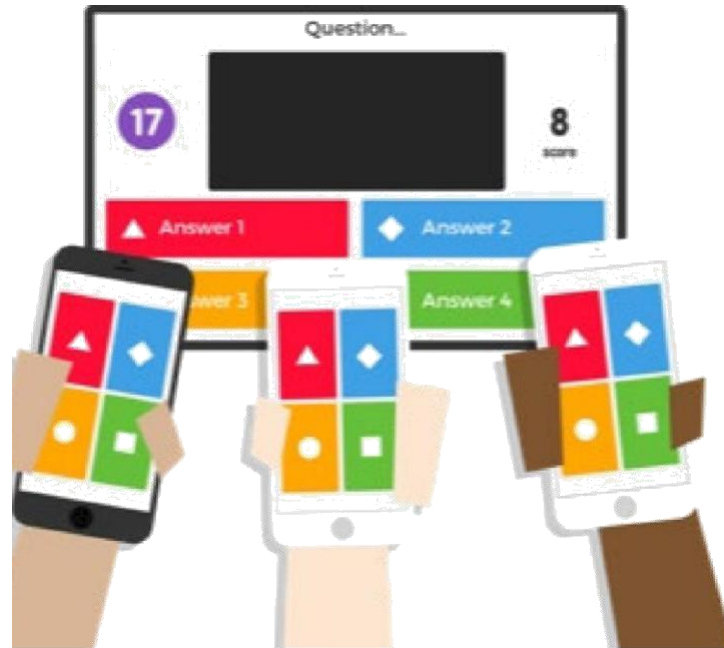
What are the benefits of Kahoot?

- **Free and stable platform** tested in schools and companies around the world.
- It is easy to use and **intuitive for students**.
- A huge number of already **existing quizzes**, albeit in English.

Fun Retro

Fan Retro is an entertaining retrospective tool that you can use in online teaching to continue to talk about what was or wasn't good. It helps you identify obstacles in real time and discuss ideas for improvements that will make your work easier.

The tool ensures that you check with your students what they think. Feedback is given through objects in the form of online sticky papers, which, as on the wall, are added in the appropriate columns in response to the question asked. Each student has the opportunity to answer one question six times, or he/she can paste six different objects in the appropriate column. As the answers are qualitative, teachers have the opportunity to take a deeper look at the needs and motivation of their students.
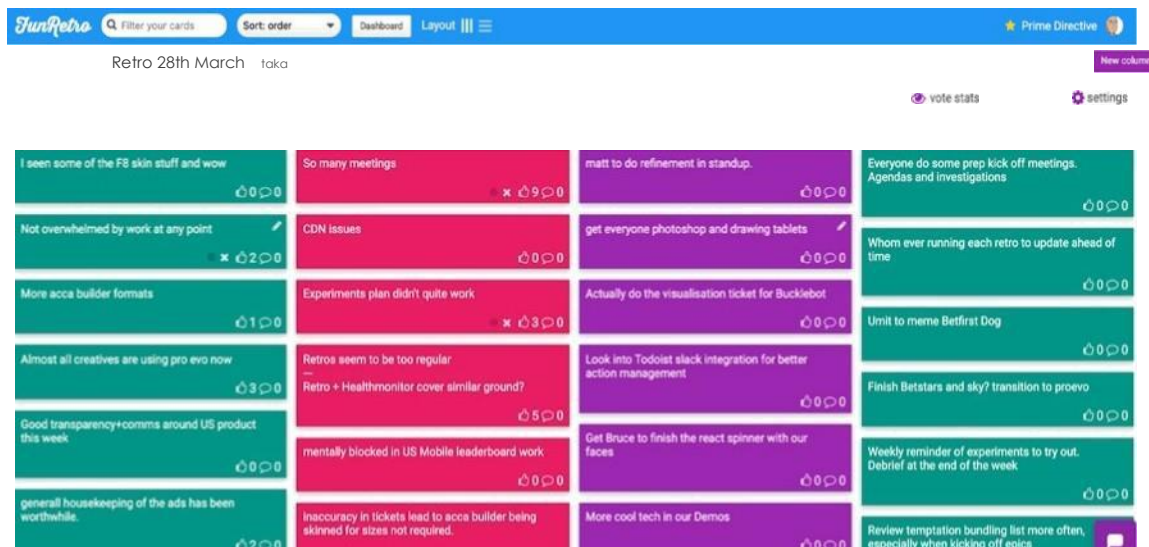
Benefits of Fun Retro tools:
- All functions of this tool can be used free of charge, except that owners of free accounts can create up to three Fun Retro discussions. If you want to continue using it for free, you need to remove the old discussions.
- It enables the participation of students and their mutual cooperation.
- Questions can be prepared in advance and Fun Retro can be shared via a URL link, which means your students are one click away from a retrospective at all times.
- It is ideal for communication in real-time, for instance to obtain feedback at the end of each online lectures.
- It encourages the exchange of knowledge among students in a fun online setting.

Youth Pass

We present you European passport skills or Youth pass, a tool for the evaluation of acquired knowledge, skills and competence, which is an integral part of the strategy of the European Commission for approval and recognition of non-formal learning. *The Youth Pass* Certificate is recognition for participating in Erasmus + programs.

In addition to confirmation of participation in projects, exchanges, training sessions, this tool also serves as a confirmation of achieved and developed competencies and skills.
The peculiarity of this certificate is reflected in the fact that individuals independently enroll

their acquired competencies. Everyone knows best how much they have really learned. Great attention is focused on the learning process when creating this certificate, where people become aware of their skills, adopt and upgrade their knowledge

EUROPEAN COMMISSION   Erasmus +

o t pass

YOUTH EXCHANGES

Participant's first and last name
02/03/1989 Brussels, Belgium

Some of the competencies recognized by the *Youth Pass* tool are shared with you below - communication in the mother tongue, communication in foreign languages, mathematical competencies and basic competencies in technology, digital competencies, learning process competencies, social and civic competencies, competencies in the field of entrepreneurship, awareness of the culture of expression.

Although this tool is intended for organizations and institutions (for example schools) users of Erasmus + support instruments, the general opinion is that the application of this certificate can be found in the formal education system by teachers recognizing and evaluating the acquired knowledge of their students. This model can also serve as an inspiration for teachers to create similar solutions for their students' self-assessment, especially during the implementation of project based learning and distance learning programs. The application of this method of assessment encourages the development of introspection and critical thinking in students.

Advantages of the *Youth Pass* self-assessment tool:
- It is filled with information on the activities implemented during the project and on the learning outcomes.
- Completed certificates are then automatically generated and sent via e-mail in PDF format.
- The certificate is recognized and highly valued in economies across Europe. Many companies additionally value this certificate when hiring.

You can see what it is like to fill in this certificate in the video guide for filling in and generating the certificate, created by the Tempus Foundation in Serbia - https://www.youtube.com/watch?v=g4eh1OrrKhc.

Typeform

Typeform is specialized software for creating online questionnaires. In education, it is used for knowledge testing.

Typeform

The software is characterized by extremely dynamic forms easily adaptable to end users. It is interesting that it was used by companies such as *Apple Inc.*, *Airbnb*, *Uber* and *Nike.* This software produces millions of questionnaires for its users every month.

Advantages of Typeform:
- The platform can be used for free, however the number of free forms or assessment tests is limited to three, which means that you have two options,

either to delete previous tests to create new ones, or to pay for a premium account.

- It is extremely intuitive and easy to use, which allows end users a simple and fun experience.
- There are various forms with pre-created questions (in English only), which can serve as inspiration for you to create questionnaires or tests.
- The questions, and therefore the questionnaires, are tailored to the target group, their content is so **interesting that you just can't wait to answer the question.**
- Automated data processing allows you to quickly create reports and also easily present them to interested parties in the general public, such as parents, for example.

Resources for planning and implementation of project based learning and distance learning

Curricula should listen for the trends in different industries and adapt to prepare students for the uncertain future. Regular monitoring of relevant sources of information, science, development of the economy and society as a whole, contributes to both the personal development of teachers and the potential improvement of the quality of content in classrooms. Having in mind the space that teachers have in planning classes and harmonizing their plans, the authors made an effort to facilitate this process by presenting an online knowledge base.

The presented knowledge bases, popularly called "resources" by the authors of the handbook, depict the reach of the Internet, as they enable both teachers and students to access the most relevant and up-to-date information at the moment.

A resource such as *Google Scholar* provides an opportunity for everyone to follow the work of scientists from various fields. TED Talk, on the other hand, provides a useful base of ideas in a video format that is ideal for use in the classroom. Most of the lectures in this database have been translated into Serbian. The "Living Democracy" portal offers guidelines in the form of manuals and books for teaching civic education. Many other resources presented in this chapter were created with the intention of contributing to improving the quality of your teaching.
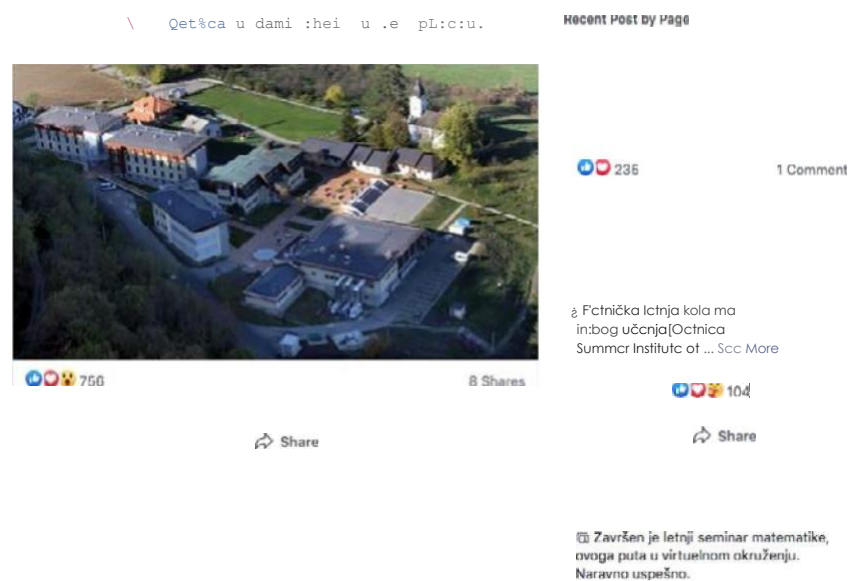
Petnica

[Petnica Science Centre](#) was founded in 1982 at the initiative of a group of young researchers, teachers and students dissatisfied with then practice in education and the formation of young scientific staff. It was truly the first independent educational organization in the former Yugoslavia.

During 38 years of development and work, Petnica SC has successfully organized over 3,500 various courses, camps and seminars attended by more than 50,000 participants and about 6,000 lecturers and professional associates.

The previously mentioned experience and the current situation caused by the crisis have urged the expert team of Petnica SC to create a unique database of Petnica online resources. Content from the domains of natural, social, technical sciences, art and design has become available to anyone who expresses interest in these areas. The database can also be used in regular classes, because there is a large selection of books, useful links, video tutorials, courses from the previously mentioned disciplines in one place.

Advantages of Petnica's online resources:

- They are free to use. They are available through the Petnica website.
- They are organized within a PDF document, which makes the database extremely mobile, resources can be easily shared through various channels, from the Facebook group, through email and messaging services such as Viber or *Whatsapp*.
- The database consists of relevant PDF books, videos in various formats, links to sites and online courses.

Digital National Library of Serbia

[The Digital National Library of Serbia](#) was built in accordance with the principles of open access to knowledge and information. Digitized material from the collections of the National Library of Serbia represents a public national resource.

The contents of the National Library can be read, viewed and listened to. You can set off on a journey around Serbia, the region, Europe and the world with the help of travel literature, collections of old photographs and good quality sound.

Advantages of the Digital National Library of Serbia:
- All content is free.
- In addition to digitized books and books in audio format, the content is enriched with digitized old photographs.
- The content is simply organized, because it is thematically divided into appropriate collections, which offers users a quick search and easy to find the desired material.

ArXiv

[ArXiv](#) is an open archive of scientific articles in the field of physics, mathematics, computer science, quantitative biology, quantitative finance, statistics, electrical engineering and the science of systems and economies. ArXiv is a digital resource financed by the community, or citizens through individual donations. It was founded by [Paul Ginsparg in](#)1991, and its work is managed by Cornell University, United States.

Advantages of ArXiv:
- ArXiv is free to use.
- The database consists of various scientific articles on the latest achievements in the mentioned fields. In addition, the database is regularly updated.
- It is easy to use and search. Search responds quickly to keyword queries.
- Articles are in the form of PDF and word documents, they are free to download, which also enables their easy mobility, or further sharing.

Google Scholar

Google Scholar is a freely accessible web search engine of scientific works, released in beta in 2004, it is a member of the Google family.

What sets it apart from other search engines is the exceptional database, which consists of more than 389 million documents, as well as the automatic search, which, in addition to information on scientific work, also offers data on citing scientific work in other relevant documents. This functionality sets Google Scholar apart from other similar search engines.

This tool is extremely easy to use, because it uses the same principle as Google search, both for searching and for presenting results. The user experience will be known and adapted to teachers and students.

Advantages of Google Scholar as a tool:

- The largest database of scientific literature in the world. The database consists of peer-reviewed scientific articles, books, conference papers, dissertations, working versions, technical reports and other professional literature.
- The search experience is simple, it is based on the Google principle, i.e., you can type any keyword into the search engine and it will respond with a list of relevant

information in relation to the search criteria you set. However, this does not mean that you will easily get the information you want. The search will be facilitated only if your request is specific, for example the title of a scientific paper (at least approximate) or the name and surname of the author.

- Another important feature of this tool is reflected in the ability to search for scientific literature in the Serbian language.
- It gives you the opportunity to easily organize articles within your library, for example for later reading.
- It offers access to a list of the best rated scientific papers from one hundred different fields in the last five years.

NaPON

The National Open Science Portal (NaPON) was released in March 2020 and is an effort of the Open Science Movement that aims to make scientific achievements, especially those financed by the Republic of Serbia, available to all interested citizens.

Open science is often equated with free access to publications, but it is much more than that. Open science means providing access to the entire process of production of scientific and artistic results to all interested citizens.

The portal is intended for everyone, from researchers and artists, through competent bodies dealing with the development of strategies in the field of science and culture, then teachers who are finally able to easily follow the development of science in various fields and use innovations in their classes in real time.

Advantages of NaPON portal:

- Free and understandable scientific content.
- Possibility of direct connection with researchers, artists, interested organizations and companies, or all potential partners and various stakeholders from the general public are in one place and can easily get involved in various educational initiatives.

TED

TED- Acronym for *Technology-Entertainment-Design-* is a non-profit organization, founded in 1984 in the United States. The mission of this organization is inspired by a simple idea - spreading inspirational stories, experiences and ideas. This non-profit organization is known for organizing TED Talks. TED Talks are specific in that the speakers are people who have knowledge from various fields, presenting their inspirational ideas in lectures of up to eighteen minutes. This avoids unnecessarily burdening the audience with details, and the speakers in that time have to express the bottom line of their story. The main goal of each speaker is to inspire and move the audience to action in the direction of a positive transformation of our global society.

All speeches are recorded and after the conferences, which are taking place around the world today, they are posted on the site www.ted.com, where they can be viewed for free. The TED Talk database is exceptional and today serves as a unique tool for both learning and research.

Extremely important and in our context a very interesting part of the TED ecosystem is Ed.Ted.com, dedicated to education and exists in two forms, respectively: YouTube channel and website, which contain animated educational videos from different disciplines. Data from 2019 tells us that this system alone has over 10 million subscribers and over 1.5 billion views.

Advantages of the TED platform:
- The collection of TED Talks is free and extremely easy to search.
- The platform does not condition users with registration, all content is available and transparent, both on the platform itself and on the YouTube channel.
- The advantage of watching speeches on the TED platform is in translations available into most world languages. We also point out that the vast majority of speeches have already been translated into Serbian, which makes the content more accessible.

Google Arts and Culture

Imagine walking down the Louvre or the National Gallery in London in one day or being on the roof of the Taj Mahal. Today's technology can give us this amazing experience. It is necessary to possess an average smart phone and the Google Arts and Culture application installed.

This interesting application has been part of the Google family since 2011, and represents an exceptional resource of world cultural heritage.

It is carefully designed for culture lovers and all curious citizens who like to explore cultural products, cultural heritage, religions, traditions and many other contents from the domain of culture and art.

Advantages of the Google Arts and Culture app:

- The world's largest cultural heritage database.
- An easy search that allows everyone to click on the content they want.
- Ability to self-organize content and integrate with other Google tools and applications, such as Slack.
- It offers various learning options, such as experimentation, which accelerates the process of research and acquisition of knowledge in the field of art and culture.

Living Democracy

Living Democracy portal is the result of a project of the same name supported by the Council of Europe. The content of the portal, or free resources, were created for all teachers, especially those who teach Civic Education, according to many and the most important subject for the development of critical thinking and civic solidarity.

Advantages of Living Democracy:

- The portal and all content in the form of manuals and additional materials are in Serbian.
- All available resources are free of charge; they are also easy to download.
- In addition to the manual, the base of free resources is characterized by interesting promotional materials, children's rights cards, official documents at the European level in the field of human rights and video content in the form of animated films.

Practical examples of project based learning and distance learning

New circumstances caused by the Covid pandemic have led to the rapid shift of knowledge transfer from classrooms to e-space. These circumstances have inspired the creation of this handbook, but also many other good practices in the field of education.

Given the demonstrated agility of teachers and their quick adaptation to new conditions, NALED and "Connecting", the Organization for Career Development and Youth Entrepreneurship in cooperation with the Ministry of Education, Science and Technological Development, the Institute for the Improvement of Education and the Republic Public Policy Secretariat with support of the United States Agency for International Development (USAID), organized a competition to select the best distance learning practices called "Magic is in the hands of teachers."

More than 700 applications from schools across Serbia were submitted. A collection of distance learning practices is another useful online knowledge base. Everyone can access this free resource through the platform of the Public-Private Dialogue project - https://jpd.rs/online-nastava. Examples can be searched by areas, classes and types of teaching that teachers can use.

In the next chapter, in addition to examples of distance learning, created on the Udemy platform in the form of an online course by the *Euro-Guidance* Center in Serbia, best practices of distance learning taken from the competition "Magic is in the hands of teachers" are presented, illustrating the use of digital tools referred to in this handbook.

Udemy online course: Introduction to career guidance

Authors: Marko Banković, Sofija Petrović, Jadranka Lilić, Miljana Kitanović, Mirko Marković, Biljana Đorđević, Maja Svetozarević

Organization: National *Euro-Guidance* Center in Serbia

Type of course: Online course with pre-defined video content

Age: Adults

Number of participants: Unlimited

Time: 5 hours of video content

The course is intended primarily for high school teachers in Serbia, especially those who have little or no experience in conducting career guidance and counseling services (abbreviated – CGC services). This knowledge can be useful to all teachers, and especially to form teachers and school pedagogues and psychologists.

The course is designed to introduce participants with the basic concepts related to career guidance and counseling, career management skills, modern career understanding, but also to the legal obligations that high schools have in relation to the implementation of CGC services.

Also, the chapters on self-assessment, career information, occupations, presenting to employers, planning and decision-making, individual work with students and organization of the school team, include theoretical foundations, but also instructions on specific activities that teachers can carry out in school and information that will help teachers design their own CGC activities.

The course is free, and participants can access it at any time from any place and device, it also offers the opportunity for participants to independently organize the dynamics of learning, because the content is prepared and posted in advance.

Learn more: https://www.udemy.com/course/karijerno-vodjenje/ Note: The presented example illustrates distance learning in the form of a video course. We would like to emphasize that this is not an example of project based learning done at a distance.

Save the honey bees

Author: Đurđica Stojković

School: Jovan Popović, Beočin

Type of school: Primary

Subject: Project Based Learning

Teaching method: Project

Age: 8-10

Number of students: 11 **Digital tools used:** YouTube, Wix, Story Jumper, Earth Day, Doodle, Learningapps, Microsoft Teams

Project based learning topic titled "Save the Honey Bees" is intended for younger primary school students.

Challenging question for students: "How can we help honey bees?"

The students created bee feeders and a book about bees, looking at the way of life and honey bee anatomy. Students were asked to investigate the causes of bee endangerment and, on the other hand, to investigate how they could solve the problems that bees encounter on a daily basis.

The project activities aimed at: constructing bee feeders; creating an online book about bees.

Read more: https://jpd.rs/takmicenje-za-najbolju-online-nastavu-prijava-skole.php?id=522

Life according to classroom no. 18

Author: Mirjana Stakić Savković

School: Philological High School, Belgrade

Type of school: High School

Subject: Literature

Teaching method: Project

Age: 18–19

Number of students: 70

Digital tools used: Skype, Viber, e-mail, Microsoft Office

"Life according to classroom no. 18 - Stories and narratives in the age of Corona virus, students' e-book in 11 languages" project was intended for fourth grade high school students.

The students created an e-book of 156 pages, and among them - twenty stories in Serbian, twenty stories translated into English, four translated into French and German, one translated into Russian, Spanish, Italian, Chinese, Japanese, Norwegian, Korean and Latin.

All stories were written and translated by students who were involved in this two-months long project.

At the very beginning the students were required to write a story about fictional characters who found themselves in Serbia during the spring of 2020. Then, they were asked to analyze the created essays and subsequently to select a certain number of stories according to predefined criteria.

Project activities aimed at: creating a book in different formats (written and audio); quality analysis and assessment; translation work; promotion of results. Read more about it at: https://jpd.rs/licenje-za-najbolju-online-nastavu-prijava-skole.php?id=462

As Ancient Rome news agency reports...

Author: Jelena Lilić

School: "Milivoj Petković Fećko", Platičevo (Ruma)

Type of school: Elementary

Subject: History

Teaching method: Project

Age: 11–12

Number of students: 34

Digital tools used: Google Classroom, Google Questionnaire, Linoit, Kahoot, Flipsnack

The main goal of the "As Ancient Rome news agency reports..." project, intended for fifth grade students, was the systematization of knowledge about the history of ancient Rome.

The main task for the teams of students was to create newspaper articles from the period of ancient Rome and then to combine and publish them in the form of electronic newspapers.

News stories were written by students during the three-week project.

Students were expected to work in a team, go through material on a given topic together, analyze the information gathered and independently present the results of their learning in an online setting.

Project activities aimed at: creating electronic newspapers; promoting project product; assessing acquired knowledge.

Read more about it at: https://jpd.rs/licenje-za-najbolju-online-nastavu-prijava-skole.php?id=462

Serbian realistic fiction

Author: Jelena Čolić

School: Sestre Ninković**,** Medical school with on campus housing, Kragujevac

Type schools: Vocational High School

Subject: Serbian language and literature

Teaching method: Project

Age: 15–16

Number of students: 60 **Digital tools used:** *Padlet*, *Canvas*, Google Forms, *Storyboard*, *Word, Art Generator*, Comic Book Designer

The main goal of the "Serbian realistic fiction" project was to deepen knowledge about Serbian realists and their works.

The task was to create a digital collection of works of five Serbian realists. Google Classroom was used for regular communication with students.

Students were expected to work in a team, go through material on a given topic together, choose a writer and his/her work that would be looked at closer, collaborate and exchange information, and finally present the learning outcomes in an online setting.

The project activities aimed at: creating a digital collection of works; presenting learning outcomes; evaluation and self-assessment.

Read more about it at: https://jpd.rs/licenje-za-najbolju-online-nastavu-prijava-skole.php?id=436
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Marko Kraljevic – a digital board game

Author: Olgica Spasojević

School: Petar Leković, Požega

Type of school: Elementary

Subject: Serbian language and literature

Teaching method: Project

Age: 12–13

Number of students: 24

Digital tools used: Zoom, Moodle, Google tools, YouTube

The main goal of the "Marko Kraljević – a digital board game" project was to encourage sixth grade students to make connections and apply what they have learned.

During the two-week project, students were expected to read poems on a given topic on their own, then find additional information, compare content, and memorize key facts.

The task was to create a board game, and the creative process was broken down into the following activities: designing questions based on the information gathered; digitizing collected material - creation of quizzes, mini comics, illustrations of scenes from songs; presenting the project product; assessing acquired knowledge.

Read more about it at: https://jpd.rs/licenje-za-najbolju-online-nastavu-prijava-skole.php?id=508

An interactive parabola lesson

Author: Jasmina Micić

School: First Grammar School of Kragujevac

Type of school: High School

Subject: Mathematics

Teaching method: Project

Age: 15–16

Number of students: 28

Digital tools used: *Quizalize, My Showbie, Stormboard, Linoit, Forms office, e-Twinning, Edmodo, MS Teams*

The aim of the lesson on parabola was to connect what had been learned about quadratic functions and trigonometric inequalities.

This distance learning session lasted for one school class, and in it students first watched a two-minute video and analyzed their prior homework, and then were expected to engage in teamwork and complete a new task. At the end of the class, the students presented their solutions.

The activities of the school lesson were: team work aimed at completing the task; presentation of the solution and guided discussion.

Read more about it: https://jpd.rs/licenje-za-najbolju-online-nastavu-prijava-skole.php?id=647

Guidelines and advice for community networking and fundraising

There is a common misconception that education is acquired exclusively in schools. However, educators around the world point out that people are educated everywhere and at all times and that a person learns while he is alive. It is possible to learn through organized formal and informal programs, as well as in an informal context.

The authors decided to focus in this chapter on providing guidance to teachers on how the wider community can support quality formal education. The key to quality education lies in the distribution of responsibilities and cooperation.

In this regard, a brief overview of relevant civil society organizations and donors in the Republic of Serbia was presented, to include those who have been showing great interest in cooperating with both schools and teachers for several years now.

Models for additional fundraising to facilitate project based learning in schools are also highlighted below. More precisely, the chapter discusses the models of company fundraising and mass fundraising through online platforms, such as donation.rs.

The authors of the handbook deliberately avoided presenting traditional models for seeking additional funding for project based learning. We wanted to showcase innovative financing practices that have been around the world for a decade.

Cooperation with civil society organizations

Civil society organizations are a good resource in local communities. Schools and their employees continue to instill incredible trust in the eyes of donors and therefore represent a very desirable partner for any organization. On the other hand, over the years of development and work, organizations have developed various expertise, from company fundraising, through mass fundraising, to knowledge of how to write and implement national and European projects.

Opportunities for joint work and creation are reflected primarily in the opportunities offered by donors, such as the European Commission through Erasmus + and the Regional Youth Cooperation Office (RYCO), with its continuous calls for cooperation between schools and civil society.

A good source in terms of checking the quality of organizations are umbrella associations such as the National Association of Practitioners/Youth Workers and, for example the Umbrella Organization of Serbian Youth ,that gather more than 150 members throughout Serbia and whose list of members can be found on their webpages.

Therefore, we invite teachers to look for local organizations in their communities that are open for cooperation and then approach them in order to apply together for national, regional, European funds and, potentially, together with them reach out to local, national and multinational companies with their projects.

Fundraising at the local level

One of the biggest challenges of everyone involved in education is the lack of basic funds for quality teaching. The fact is that our schools are not sufficiently equipped, but it is also a fact that various interest groups, such as companies and citizens, are making extraordinary efforts year in year out to improve the education system.

This is confirmed by the results of the survey on the state of philanthropy in Serbia "Giving Serbia 2019", which show that the business sector is highly ranked as a donor, right behind the citizens, and participates in the total amount of donated amounts with almost 40% at the national level.

The previously mentioned survey also tells us that education is one of the four most common areas for which people are glad to give. We would like to note that education got 12.9% out of the total amount of donated funds in 2019.

MODERN EDUCATION FOR THE FUTURE OF OUR CHILDREN - EQUIPPING THE IT CABINET OF THE PRIMARY SCHOOL IN ŠID, 31 donors, RSD 507,000.00 collected. Donors were companies and citizens Source https://www.donacije.rs/projekat/informaticki-kabinet-sid/.

The data indicate that businesses understand the importance of education and are therefore ready to allocate significant funds for its constant improvement. These are good indicators, especially if we keep in mind that every fourth donated amount goes to institutions, which further means that there is still confidence in institutions, because the donors believe that their money will be purposefully spent.

In relation to this data, there seems to be a space in the fundraising market that educators can use to fund project based learning or any other educational initiative, for that matter. One of the challenges in this process is the fact that educators do not know enough about fundraising, or how to create a request for donations or sponsorship, and do not have enough spare time to deal with this additional work, to send emails, communicate with new partners, go to meetings and present ideas for which they need support.

We, however, have in mind all these challenges, we believe that there are more, but we invite teachers to give it a try, because an increasing number of companies have an ear for the needs of quality education. We believe that these efforts will lead to a meaningful redirection of surplus capital to where it is most needed, and that is the formal education system.

We use the opportunity to refer teachers to local foundations in Novi Pazar, Obrenovac, Zaječar, Pančevo, Paraćin, Niš, then to the Trag Foundation and *Catalyst Balkan*s, because all of them have been developing expertise in the field of fundraising, locally, for years and are happy to share their knowledge, therefore they can be a good resource for gaining initial knowledge about fundraising from companies.

Mass fundraising

The previously presented fundraising model is based on the model of mass fundraising, which has been successfully used for a decade to finance initial ideas. It has also been successfully applied in Serbia, but more about that below.

Crowdfunding is an online process of raising funds from a large number of people who usually share the same passion in connection with a project that requires support. C*rowdfunding is* coined in English from words *crowd*, which means group, crowd, mass and the word *funding* which means financing.

What is it really about?

We have all at least once been in a situation where we have a good idea without having enough money to implement it. Crowdfunding platforms respond to this problem, because people around the world come to start-up capital, or money, through them, with the help of which they implement their ideas. These platforms experienced an incredible expansion during 2009, after the global recession, when citizens around the world supported each other in order to successfully implement projects from various disciplines. Today, these platforms successfully raise funds for the implementation of both local and global projects.

This method of fundraising for projects, which are at the level of an idea or a tested prototype, finds its application in formal education systems around the world and is a very useful fundraising tool for project based learning. It can also be useful for fundraising for the final products created by the project based learning method.

There are also narrowly specialized platforms intended exclusively for fundraising for school projects initiated by teachers and students. A good example of one such platform is Donorschoose.org, which has yielded significant results in the United States.

Group funding models:
Donations, intended for humanitarian and non-profit organizations, do not imply that individuals who support project ideas receive anything in return. It is interesting that one such platform has been successfully operating in Serbia for several years. It is donacije.rs platform. Many school projects are funded through these platforms, such as digital classrooms and POKUŠ.AI Lab.

EQUIPPING A DIGITAL CLASSROOM IN SOMBOR FOR NEW GENERATIONS OF HIGH SCHOOL STUDENTS

40 donors, RSD 896,867.00 collected
Donors were citizens and companies.
Source:
https://www.donacije.rs/proje kat/digitalna-ucionica-sombor/

- The most widespread model is based on awards. The popular world platforms Kickastarter and Indiegogo are based on this principle. In this type of crowdfunding, a reward is offered in exchange for financial support. The prizes are arranged in several categories, from symbolic ones, such as badges or T-shirts, to valuable prizes that are actually fundraising products (books, bicycles, wooden glasses, 3D printers, etc.).
- The investment model and the loan model are mostly used for finance startup companies, and are somewhat less present in the field of education.

In Serbia, more than $ 700,000 was raised through crowdfunding platforms in 2017 alone. It is also interesting to note that more than 10,000 people donated funds to support over 400 campaigns launched during the year.

Finally, we would like to emphasize that creating a campaign is a project in itself and requires a lot of knowledge and effort, but in the process of planning and implementation you do not have to be alone, because organizations such as the Serbian Philanthropic Forum, Brodoto Serbia and GIZ - through Crowdfunding Serbia, offer different types of support - from training and knowledge transfer, through joint creation of content for campaigns and, then, public promotion.

Advantages of crowdfunding:

- It costs you nothing to try, the platforms are free and anyone can create a project and advertise it through them.
- In addition to the money raised for your ideas, the benefit is reflected in increased visibility (there will be media appearances, your school's website or your project's website will be extremely well positioned on Google), many people will contact you and want to work with you.
- Students will feel that they are doing something fresh, they will have the opportunity to apply their knowledge and competencies and immediately see the result, which will contribute to enjoying the learning process.

While you may think that this fundraising model is foreign to our conditions, it is widely applied in Serbia. With the help of one crowdfunding campaign, Petnica collected four million dinars, "Sremski Front" primary school more than 500,000 dinars, the B92 Fund, together with 100 special schools throughout Serbia, more than 6.5 million dinars, etc. A large number of educational initiatives have been implemented with the support of Erste Bank through *Superste* donation program. You can find more examples, as well as tips on how to start your fundraising campaign on the donacije.rs website

Afterword

Writing this handbook was both a challenge and an adventure for us. We were constantly aware of the importance of the practical application of everything we write about, we had in mind the advice of a large number of experienced colleagues, who create magic in their classrooms, and the debt we owe to the whole community of teachers and all people in education. In our opinion, they handle the most important societal task every single day - preparing and educating young people for the future we all hope for together.

The cooperation in the competition "Magic in the hands of teachers" showed us some of the most beautiful examples of enthusiasm and professionalism. We have included some of them in this handbook as illustrations of the principles of project based learning and distance learning. We strongly recommend that you review others on the website used to promote the competition, as, due to the scope of this handbook, we have not been able to present all of them in more detail. We talked to the teachers and tried to see the values and shortcomings of the tools we presented through the prism of their experience. We are confident that these tools, as well as the resources we have drawn attention to, will benefit teachers, even as life and teaching return to normal.

Project based learning is one of the most contemporary and creative approaches to organization of the educational process. While distance learning obviously has its limitations, there is currently a real need for it. The key to the success of these methods lies in the hands of all who work in education! If we accept the challenges, we look a little further outside our safe circle of colleagues, a little further outside the school yard and if we begin to believe that cooperation, good communication, imagination and critical thinking of our students is more important than each individual subject and each specific textbook lesson, we will share with our students something essential, vital and really important.
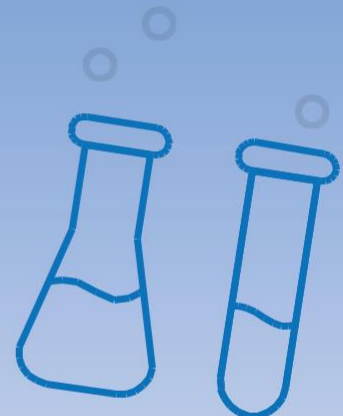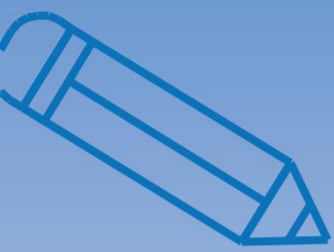
Authors

Milan Petrović is a Teacher of Serbian Language and Literature, the founder and Program Director of "Nauči me"(Teach me) citizens' association, which deals with innovations in education, as well as an alumnus of the Fulbright program. He is the author of "Vučilo-dolina magičnih reči" (Vučilo- Valley of Magic Words) – an application offering a game for learning and practicing the spelling of the Serbian language. With his team, he dealt with digitalization in education, educational policies, especially the difficulties that children with dyslexia have in schools, through the project "Heroes learn differently". This team in Niš opened the "Unbox Hub of Innovative Education" for young people to learn through practical work and project based learning.

Deniz Hoti is a serial entrepreneur, film director and consultant in the fields of social innovation, education and youth work, with more than 9 years of experience in the public, corporate and civil sector in Serbia. He was awarded for designing the educational program "Kad porastem biću" ("When I grow up I want to be"). He founded Connecting and co-founded SINHRO Hub and Trip House.

Olivera Todorovic holds a master's degree in mathematics and she is Assistant Director of the Institute for the Improvement of Education. She is the author and co-author of numerous collections and textbooks, manuals, workbooks, articles and accredited programs, as well as the winner of the "Stojan Novakovic" award for the best set of textbooks. Extremely versatile and dedicated, she actively participates in various projects and commissions dealing with education.